PERTANIKA JOURNAL OF SOCIAL SCIENCES & HUMANITIES

About the Journal

Overview

Pertanika Journal of Social Sciences & Humanities is the official journal of Universiti Putra Malaysia. It is an open-access online scientific journal. It publishes original scientific outputs. It neither accepts nor commissions third party content.

Recognised internationally as the leading peer-reviewed interdisciplinary journal devoted to the publication of original papers, it serves as a forum for practical approaches to improve quality in issues pertaining to social and behavioural sciences as well as the humanities.

Pertanika Journal of Social Science & Humanities is a **quarterly** (*March*, *June*, *September*, *and December*) periodical that considers for publication original articles as per its scope. The journal publishes in **English** as well as in **Bahasa Malaysia** and it is open for submission by authors from all over the world.

The journal is available world-wide.

Aims and scope

Pertanika Journal of Social Sciences & Humanities aims to develop as a pioneer journal for the social sciences with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities. Areas relevant to the scope of the journal include Social Sciences—accounting, anthropology, archaeology and history, architecture and habitat, consumer and family economics, economics, education, finance, geography, law, management studies, media and communication studies, political sciences and public policy, population studies, psychology, sociology, technology management, and tourism; Humanities—arts and culture, dance, historical and civilisation studies, language and linguistics, literature, music, philosophy, religious studies, and sports.

History

Pertanika Journal of Social Sciences & Humanities was founded in 1993 and focuses on research in social and behavioural sciences as well as the humanities and its related fields.

Vision

To publish journal of international repute.

Mission

Our goal is to bring the highest quality research to the widest possible audience.

Quality

We aim for excellence, sustained by a responsible and professional approach to journal publishing. Submissions can expect to receive a decision within 120 days. The elapsed time from submission to publication for the articles averages 180 days. We are working towards decreasing the processing time with the help of our editors and the reviewers.

Abstracting and indexing of Pertanika

Pertanika Journal of Social Sciences & Humanities is now over 27 years old; this accumulated knowledge and experience has resulted the journal being abstracted and indexed in SCOPUS (Elsevier), Clarivate Web of Science (ESCI), EBSCO, DOAJ, Agricola, ASEAN CITATION INDEX, ISC, Microsoft Academic, Google Scholar, and MyCite.

Citing journal articles

The abbreviation for Pertanika Journal of Social Sciences & Humanities is *Pertanika J. Soc. Sci. & Hum.*

Publication policy

Pertanika policy prohibits an author from submitting the same manuscript for concurrent consideration by two or more publications. It prohibits as well publication of any manuscript that has already been published either in whole or substantial part elsewhere. It also does not permit publication of manuscript that has been published in full in proceedings.

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The *Pertanika* journals and Universiti Putra Malaysia take seriously the responsibility of all of its journal publications to reflect the highest publication ethics. Thus, all journals and journal editors are expected to abide by the journal's codes of ethics. Refer to *Pertanika*'s **Code of Ethics** for full details, or visit the journal's web link at: http://www.pertanika.upm.edu.my/code_of_ethics.php

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The author must ensure that when a manuscript is submitted to *Pertanika*, the manuscript must be an original work. The author should check the manuscript for any possible plagiarism using any program such as Turn-It-In or any other software before submitting the manuscripts to the *Pertanika* Editorial Office, Journal Division.

All submitted manuscripts must be in the journal's acceptable **similarity index range**:
≤ 20% – PASS; > 20% – REJECT.

International Standard Serial Number (ISSN)

An ISSN is an 8-digit code used to identify periodicals such as journals of all kinds and on all media–print and electronic.

Pertanika Journal of Social Sciences and Humanities: e-ISSN 2231-8534 (Online).

Lag time

A decision on acceptance or rejection of a manuscript is reached in 120 days (average). The elapsed time from submission to publication for the articles averages 180 days.

Authorship

Authors are not permitted to add or remove any names from the authorship provided at the time of initial submission without the consent of the journal's Chief Executive Editor.

Manuscript preparation

Most scientific papers are prepared according to a format called IMRAD. The term represents the first letters of the words *Introduction*, *Materials and Methods*, *Results*, *And Discussion*. IMRAD is simply a more 'defined' version of the "IBC" (*Introduction*, *Body*, *Conclusion*) format used for all academic writing. IMRAD indicates a pattern or format rather than a complete list of headings or components of research papers; the missing parts of a paper are: *Title*, *Authors*, *Keywords*, *Abstract*, *Conclusions*, *References*, and *Acknowledgement*. Additionally, some papers include *Appendices*. For manuscripts in **Bahasa Malaysia**, the title, abstract and keywords should be written in both **English** and **Bahasa Malaysia**.

The *Introduction* explains the scope and objective of the study in the light of current knowledge on the subject; the *Materials and Methods* describes how the study was conducted; the *Results* section reports what was found in the study; and the *Discussion* section explains meaning and significance of the results and provides suggestions for future directions of research. The manuscript must be prepared according to the journal's **Instruction to Authors** (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

Editorial process

Authors who complete any submission are notified with an acknowledgement containing a manuscript ID on receipt of a manuscript, and upon the editorial decision regarding publication.

Pertanika follows a **double-blind peer -review process**. Manuscripts deemed suitable for publication are sent to reviewers. Authors are encouraged to suggest names of at least 3 potential reviewers at the time of submission of their manuscripts to *Pertanika*, but the editors will make the final selection and are not, however, bound by these suggestions.

Notification of the editorial decision is usually provided within 120 days from the receipt of manuscript. Publication of solicited manuscripts is not guaranteed. In most cases, manuscripts are accepted conditionally, pending an author's revision of the material.

As articles are double-blind reviewed, material that may identify authorship of the paper should be placed only on page 2 as described in the first-4-page format in Pertanika's Instruction to Authors (http://www.pertanika.upm.edu.my/Resources/regular_issues/Regular_Issues_Instructions_to_Authors.pdf).

The journal's peer review

In the peer review process, 2 or 3 referees independently evaluate the scientific quality of the submitted manuscripts. At least 2 referee reports are required to help make a decision.

Peer reviewers are experts chosen by journal editors to provide written assessment of the **strengths** and **weaknesses** of written research, with the aim of improving the reporting of research and identifying the most appropriate and highest quality material for the journal.

Operating and review process

What happens to a manuscript once it is submitted to *Pertanika*? Typically, there are 7 steps to the editorial review process:

1. The journal's Chief Executive Editor and the Editor-in-Chief examine the paper to determine whether it is relevance to journal needs in terms of novelty, impact, design, procedure, language as well as presentation and allow it to proceed to the reviewing process. If not appropriate, the manuscript is rejected outright and the author is informed.

2. The Chief Executive Editor sends the article-identifying information having been removed, to 2 to 3 reviewers. They are specialists in the subject matter of the article. The Chief Executive Editor requests that they complete the review within 3 weeks.

    Comments to authors are about the appropriateness and adequacy of the theoretical or conceptual framework, literature review, method, results and discussion, and conclusions. Reviewers often include suggestions for strengthening of the manuscript. Comments to the editor are in the nature of the significance of the work and its potential contribution to the research field.

3. The Editor-in-Chief examines the review reports and decides whether to accept or reject the manuscript, invite the authors to revise and resubmit the manuscript, or seek additional review reports. In rare instances, the manuscript is accepted with almost no revision. Almost

without exception, reviewers' comments (to the authors) are forwarded to the authors. If a revision is indicated, the editor provides guidelines to the authors for attending to the reviewers' suggestions and perhaps additional advice about revising the manuscript.

4. The authors decide whether and how to address the reviewers' comments and criticisms and the editor's concerns. The authors return a revised version of the paper to the Chief Executive Editor along with specific information describing how they have addressed the concerns of the reviewers and the editor, usually in a tabular form. The authors may also submit a rebuttal if there is a need especially when the authors disagree with certain comments provided by reviewers.

5. The Chief Executive Editor sends the revised manuscript out for re-review. Typically, at least 1 of the original reviewers will be asked to examine the article.

6. When the reviewers have completed their work, the Editor-in-Chief examines their comments and decides whether the manuscript is ready to be published, needs another round of revisions, or should be rejected. If the decision is to accept, the Chief Executive Editor is notified.

7. The Chief Executive Editor reserves the final right to accept or reject any material for publication, if the processing of a particular manuscript is deemed not to be in compliance with the S.O.P. of *Pertanika*. An acceptance notification is sent to all the authors.

9. The editorial office ensures that the manuscript adheres to the correct style (in-text citations, the reference list, and tables are typical areas of concern, clarity, and grammar). The authors are asked to respond to any minor queries by the editorial office. Following these corrections, page proofs are mailed to the corresponding authors for their final approval. At this point, **only essential changes are accepted**. Finally, the manuscript appears in the pages of the journal and is posted online.

ABSTRACTING AND INDEXING OF PERTANIKA JOURNALS

The journal is indexed in SCOPUS (Elsevier), Clarivate-Emerging Sources Citation Index (ESCI), BIOSIS, National Agricultural Science (NAL), Google Scholar, MyCite, ISC. In addition, Pertanika JSSH is recipient of "CREAM" Award conferred by Ministry of Higher Education (MoHE), Malaysia.

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Foreword

Welcome to the fourth issue of 2023 for the Pertanika Journal of Social Sciences and Humanities (PJSSH)!

PJSSH is an open-access journal for studies in Social Sciences and Humianities published by Universiti Putra Malaysia Press. It is independently owned and managed by the university for the benefit of the world-wide science community.

This issue contains 15 articles; one review article; one case study; and the rest are regular articles. The authors of these articles come from different countries namely China, Indonesia, Iran, Kazakhstan, Korea, Malaysia, Nigeria, Thailand and United Kingdom.

Yue Ma and colleagues provide a critical review to explore the sense of place potential in cultural heritage conservation in "Potential of Sense of Place in Cultural Heritage Conservation: A Systematic Review." Six prominent themes emerged from the results, such as encouraging social sustainability, developing heritage tourism and promoting the protection and preservation of cultural heritage. Further details of the study can be found on page 1465.

An article entitled "Intersection of Gender, Globalization, and Religion in Local and Globalized ELT Textbooks in Iran" sought to investigate gender representation in two textbook series: Solutions, published by an international publisher, and the Iran Language Institute (ILI) series, written by local writers. The analysis of gender representation is guided by six criteria: visibility in pictures, visibility in text, firstness, character activity, occupations, and topic dominance. The findings indicate that in both textbook series, males exhibit greater visibility and dominance with character and occupation. The detailed information of this article is presented on page 1525.

Research conducted by Siriwan Rujibhong from Bangkok University Rangsit Campus contributes valuable insights into the relationship between the physical environments of urban and community contexts in high-rise condominiums and the mental wellbeing of their residents. The study's main goals include assessing the assumption that the high-density urban environment and distinctive structure of condominiums play a crucial role in influencing the mental wellbeing of occupants. In "Impact of Physical Environmental Factors on the Mental Wellbeing of Condominium Dwellers," interdisciplinary research tools were utilized, including a Physical-Environmental (PE) Assessment and Psychological (PP) Questionnaire. In-depth information about the study can be found on page 1587.

Over the past 12 months, 9% of the peer-reviewed manuscripts were accepted. It appears to be the current trend in PJSSH.

We anticipate that you will find the evidence presented in this issue to be intriguing, thought-provoking and useful in reaching new milestones in your own research. Please recommend the journal to your colleagues and students to make this endeavour meaningful.

All the papers published in this edition underwent Pertanika's stringent peer-review process involving a minimum of two reviewers comprising internal as well as external referees. This was to ensure that the quality of the papers justified the high ranking of the journal, which is renowned as a heavily-cited journal not only by authors and researchers in Malaysia but by those in other countries around the world as well.

We would also like to express our gratitude to all the contributors, namely the authors, reviewers, Editor-in-Chief and Editorial Board Members of PJSSH, who have made this issue possible.

PJSSH is currently accepting manuscripts for upcoming issues based on original qualitative or quantitative research that opens new areas of inquiry and investigation.

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SOCIAL SCIENCES & HUMANITIES

Case Study

Exploring Disruptive Adolescent Behaviours on Social Media: A Case Study During the Times of Crisis

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ABSTRACT

Social media usage has been observed to increase in times of crisis, like the COVID-19 pandemic, when it served as the primary means of communication with the outside world. The amplification is hypothesised to cause higher adverse consequences to adolescents with disruptive behaviours. These vulnerable youngsters, characterised by higher negative emotionality, could experience a more unfavourable impact of the media than those with non-disruptive behaviours. However, the extent to which the media can affect disruptive adolescents is unknown. Twenty-one secondary school adolescents identified with several disruptive behaviour records were selected for a survey and online observation of an explanatory mixed-method design. Nine adolescents' personal Instagram accounts were observed for over three months. The data recorded a medium-high social media use among the respondents, particularly in maintaining existing relationships. There were patterns of oblivious, excessive attention-seeking posts from the qualitative exploration, which conflicts with the adolescents' weak agreement on using the media to make themselves known. The adolescents' postings on spiritual advice brought some engrossing tone down of the adolescents' behaviours. The grounded religious beliefs could be their self-control mechanism when using the media. The echo chamber of their spiritual advice postings and controlled media use could be much-needed interventions for adolescents with disruptive behaviours.

Keywords: Adolescence, behaviour, crisis, disruptive, social media

INTRODUCTION

Bozzola et al. (2022) asserted that social media usage has risen rapidly since the beginning of the COVID-19 pandemic. Social media is extensively used to be updated with current affairs (Nisar et al., 2019) because the convenience of getting information instantly on the screen display has become a modern necessity compared to printed materials. As a result, social media use among teenagers becomes vital. The platform considerably impacts adolescents' motivation and life satisfaction, as Kereste and Tuhlofer (2020) reported. Adolescents use it to express their ideas freely (Boulianne et al., 2020) and gain attention and attraction (Hawk et al., 2019). The media has also created new career opportunities for youth, such as content creators and social media influencers, which are increasingly in demand (Giles & Edwards, 2018). The platform is also used to connect with friends and family, share or exchange ideas with the online community (Chukwuere & Chukwuere, 2017), create self-profile, send photos and videos, and update news statuses (Oeldorf-Hirsch & Sundar, 2015).

However, similar to many benefits, the conveniences can lead social media users to act worse than face-to-face interactions. (Hjetland et al., 2021). Uncontrolled use of media by adolescents may bring about adverse consequences, which include heightened risk for behavioural problems (Bozzola et al., 2022). Teenagers using social media without supervision are likelier to use aggressive language (Adelantado-Renau et al., 2019), hate speech (Del Vigna et al., 2017), cyberbullying (Byrne et al., 2018), sexting and cyber pornography (Farré et al., 2020; Van Ouytsel et al., 2021). We posit that the risk is likely higher negative emotionality for adolescents with disruptive behaviours than their peers. It may also double their mental and psychological health stress, sleeplessness, anxiety, and frustration (Ting & Essau, 2021).

When the virus first hit Malaysia on January 24, 2020, to slow the spread of COVID-19, the nation implemented a Movement Control Order (MCO), which included closing down educational facilities. (Khor et al., 2020). Ting and Essau (2021) reported a significant increment of time spent among Malaysian students on social media during the crisis. As a result, many adolescents who stayed at home resorted to social media for communication. The online environment has affected local teenage mental health and well-being (Hashim et al., 2020; Yusuf & Ahmad, 2020). Numerous emotional and psychological health issues, such as stress and addictive behaviours, were anticipated to arise due to the COVID-19 outbreak's protracted routine interruptions (Ding et al., 2021).

Despite this, Koh et al. (2020) stated that Malaysians' altered behaviour in reaction to the COVID-19 epidemic is "novel and expected at the same time" (p. 48). Several previous crises reported similar behaviour changes. Nevertheless, this time, most Malaysians are impacted by a person's social media network rather than their traditional network of associations. Some changes are beneficial, but excessive

or uncontrolled media use could have adverse consequences because adolescents' problematic behaviours have raised a serious concern in Malaysia (Ling et al., 2017). Media and information-communication technology have been discovered by Mansor et al. (2017) as the key contributors to disruptive behaviours in adolescents. However, the extent to which the media can affect disruptive adolescents is unknown. Therefore, this study aims to analyse social media usage among the selected disruptive Malaysian adolescents and explore its adverse impacts on adolescents.

LITERATURE REVIEW

Theoretical Background

It is crucial to know the factors behind different behavioural changes caused by the media during the pandemic. Behaviourism views external physical actions and internal states such as thoughts and emotions as a 'behaviour' (Hayes, 2016). Relational frame theory states that humans acquire knowledge and experience by connecting ideas to create a complex network that influences their thinking and decision-making. (Koh et al., 2020, p. 46). It implies that what a person does with that concept within their social network varies.

The social attachment model by Mawson (2005, p. 108) rationalises this variation based on individuals' anxiety. According to the concept, attachments are crucial "for normal human growth, development, social functioning, health and longevity". It also describes the basic essence of human beings. In times of crisis, if the anxiety experienced

is mild and attachment figures are absent, the behaviour tends to lean towards familiarity, which, in this scenario, via social media, is appropriate behaviour. If the anxiety increases significantly, individuals are required to seek out and get closer to safeguard figures such as family and friends. This behaviour is predictable in times of crisis.

Nonetheless, Mawson's (2005) model warns against an increased sensitivity towards perceived deviance, social exclusion, scapegoating, and hate crime. One feature of the affiliative reaction is the desire to move away from some circumstances and toward other perceived familiar conditions that are not objectively safe (Mawson, 2005). Hence, the choice to use the media to escape loneliness or stress during the pandemic may be a familiar thing to do.

For Malaysians, it is interesting that religion is viewed as a source of knowledge and guidance throughout the crisis. (Koh et al., 2020). Most Malaysians seek guidance from religious leaders, consistent with Mawson's model. Religion provides a valid explanation for why COVID-19 is happening. Considering that religion is ingrained in the Malaysian context from an early age, discussing or connecting the crisis from religious perspectives is frequently an obvious choice.

Another description of how individuals create their sense of self and group membership is provided by the Social Identity Theory (SIT) framework. SIT has been used to analyse social media's effects on teenagers' attitudes and behaviour (Lajnef, 2023). Adolescents use social media

to express their identities and compare themselves to others (Rodgers & Rousseau, 2022), achieved through interaction with others with similar values and opinions (Duong, 2020). SIT also explains how social identity processes influence disruptive teenage behaviour on social media (Hogg, 2021). Social media can exacerbate the negative emotions of jealousy, anger, and poor self-esteem due to social influences. Feeling threatened by their social identity or group membership can result in disruptive conduct, such as cyberbullying.

Adolescents' Disruptive Behaviours

Quinn (2005) describes behaviours as an expression of a complex interplay of biological and environmental factors. Disruptive behaviour refers to an action that results in a nuisance to others. It gives a picture of the behaviour that causes problems for others and oneself because it violates human norms and the law (Sun & Shek, 2012). On the other hand, adolescence is a crucial stage in the transition from childhood to adulthood. The initial development of cognitive, social, and emotional changes gradually makes people more susceptible to emotional and behavioural issues. (Wei & Madon, 2019). That is why disruptive adolescent behaviour is often associated with emotions and negative behaviours. It violates others' rights or established regulations, such as violence against people and property.

Social Media Effects on Adolescents

Pew Research Centre (2022) identified adolescents as the dominant social media users. The development of broadband infrastructure, mobile devices, and competition in the market is the reason for the increase in user statistics (Malaysian Communications & Multimedia Commission [MCMC], 2020). Sophisticated and affordable devices have further expedited the rate of online interactivity (Nawi et al., 2020). All these factors have made it easier for adolescents to access social media.

Studies also warned against excessive use of social media that could affect users' well-being and mental health (Geirdal et al., 2021). Mansor et al. (2017) identified media and communication technology as significant factors influencing problematic behaviours apart from home environment, peer influence, social support and school culture. Cyber-cafe-computing networks and the internet were the sources of undesirable behaviour among adolescents. The superfluousness may impair academic performance (Adelantado-Renau et al., 2019), affect sleeping quality (Brubaker et al., 2020), cause emotional disturbance (Hasan et al., 2018), trigger negative behaviours (Buctot et al., 2020), and reduce task performance (Cao & Yu, 2019). Cheung et al. (2020) found that cyberbullying, cyber harassment, cyber intrusion, and trolling (attacks and provocations) are alarming among adolescents today.

Therefore, emphasis should be given to reflecting and re-evaluating ways to balance the use of social media for leisure, especially during unexpected occurrences or during times of crisis and for adolescents whose brain is hyper-responsive to perceived

rewards (Ali et al., 2021). Teenagers may make bad decisions since their impulse control and response expressions are still developing (Brown & Wisco, 2019). Ling et al. (2017) recommended that parents and teachers practice strict rules to improve adolescents' conscientiousness through proper supervision and monitoring. In this study, 'behaviour' refers to online activities and how adolescents communicate using social media.

METHODOLOGY

This study uses the explanatory mixed-method design (Creswell & Clark, 2017) to explore 21 adolescents' online behaviour who have multiple misconduct records (Figure 1).

The study's two-phase design began with quantitative data collection to identify the level of media use among adolescents. A survey was conducted to determine the respondents' social media use level and analysed using mean scores ($\bar{x}$), ranging from low to high levels of social media (Table 1).

Online observation was used to determine the extent of the sample's social

media use. It involved the researchers as the non-participant in jotting down notes and taking screenshots of the postings, keeping records of shared news, comments, 'like' videos or links publicly shared by the nine participants on their Instagram accounts. It was necessary to collect publicly available data to gain insights into their online activities and behaviours. Also, instead of relying on a protocol, the richness of the data is captured through an inductive approach to identify themes and subthemes that emerged organically from the postings without imposing predetermined criteria. The sample's online behaviour was observed via Instagram postings until the postings

Table 1
Mean scores interpretation on the adolescent's media use level

Mean Score	Level
1.00–2.00	Low (L)
2.01–3.00	Medium-low (ML)
3.01–4.00	Medium-high (MH)
4.01–5.00	High (H)

Note. The level is to identify whether the adolescents have a 'controlled' amount of social media use (low or medium) or excessive (high), which could cause adverse consequences
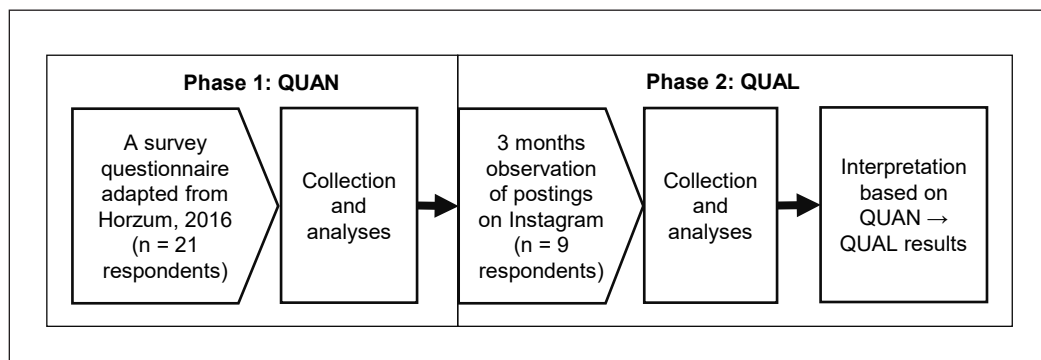
Figure 1. The study's explanatory mixed-method design (adapted from Creswell and Clark, 2017)

showed no new theme—the data reached saturation in three months (December 2020 to February 2021). The data are sufficient to draw necessary conclusions based on the study's objective (Saunders et al., 2018).

All the themes were recorded using NVivo software for thematic analysis. The thematic analysis is used to uncover patterns, trends, and insights within the participants' social media postings. The flexibility of this approach enabled a comprehensive exploration of the data, promoting a deeper understanding of the participants' experiences and behaviours.

Sampling

Twenty-one adolescents (aged between 16 and 17 years old) with disruptive behaviour records from one of the secondary schools in Terengganu were purposively chosen with the help of the school counsellors. The adolescents were reprimanded for several hostile acts in the school; they are also active Instagram users who constantly update their statuses. Nine individuals were chosen for the second phase since the researchers can follow and look at their Instagram accounts. All took part in the first phase. An anonymous coding system for the participants (T1–T9) was used, and their voluntary participation was obtained through individually signed consent forms.

The Survey Questionnaire

A questionnaire with a five-Likert scale of agreement ('Strongly Agree' to 'Strongly Disagree') was developed based on a study by Horzum (2016) that looked into

adolescent Facebook use. The questionnaire has 30 items, which are categorised into seven constructs: Maintaining an existing relationship (MR), meeting new people and socialising (MS), making oneself known and famous (KP), bringing entertainment (EN: four items each), spending free time (FT: three items), functioning as a task management tool (MT: five items) and providing information and educational content (EI: six items).

Three expert panels provided their review of the instrument to ensure its validity. The panel suggested back-to-back translations into the Malay language to optimise the respondents' feedback. The pilot study results showed that the alpha Cronbach coefficient's value for all constructs was above .60, which means high dependability and an acceptable index, as the score is above 0.6 (Nunnally & Bernstein, 1994).

The Qualitative Data Validity and Reliability Measures

Themes and subthemes analyses of the postings use a systematic coding process outlined by Miles et al. (2020). Initially, a set of codes was developed based on a careful data review. These codes were derived from Instagram postings and aimed to capture topics and patterns of behaviours observed within the participants' social media activities. An inductive method was used throughout the coding process to allow new codes and themes to arise from the data (Braun & Clarke, 2006). In this iterative process, the postings were analysed to find patterns, subjects, and concepts that

frequently appeared (Guest et al., 2012). New codes were added whenever unique themes emerged, ensuring a comprehensive and inclusive data analysis.

Intercoder reliability checks were carried out to improve the reliability and validity of the coding system (Miles et al., 2020). Researchers independently coded a subset of the data and discussed their coding decisions based on the principles of qualitative data analysis (Patton, 2015). The researchers carefully reviewed the codes, assessing their relevance to the data and ability to capture the participants' social media use. Any discrepancies or differences in coding were resolved through consensus discussions. By employing these techniques, the researchers ensured the validity and reliability of the identified themes and subthemes regarding social media use among disruptive adolescents.

FINDINGS AND DISCUSSION

Phase 1: The Adolescents' Level of Social Media Use

The results are grouped into seven factors (Table 2). The mean score of each factor shows how much the participants agreed to use social media for that purpose. The factor with the highest agreement was 'maintaining existing relationships' (MR), with a mean score of 4.23. The other factors (MS, KP, FT, MT, EN, and EI) had mean scores ranging from 3.12 to 3.99, which means the participants used social media moderately highly for those purposes during the pandemic.

Maintaining a Relationship (MR). The outcomes of using social media to keep up with existing relationships are shown in Table 3. Except for the MR3 item, there is a high level of agreement with this element. The respondents regularly utilise social media to stay in touch with friends and acquaintances (MR2 and MR4), unlike those they infrequently meet (MR3).

Meeting New People and Socialising (MS). The participants mostly agreed to use social media for making new friends and socialising (MS), as shown by the medium-high mean scores in Table 4. The only exception was MS2, with a medium-low mean score of 2.86. It means that the participants were

Table 2

Levels of agreement on the seven social media use aspects

No.	Aspect		$\bar{x}$	Level
1	MR	Maintaining Existing Relationship	4.23	High
2	MS	Meeting New People and Socialising	3.51	Medium-high
3	KP	Making Oneself Known and Popular	3.12	Medium-high
4	FT	Spending Free Time	3.63	Medium-high
5	MT	Functioning as a Task Management Tool	3.29	Medium-high
6	EN	Bringing the Entertainment	3.99	Medium-high
7	EI	Getting Educational and Information Material	3.63	Medium-high

Note. The seven aspects of the questionnaire are adapted from Horzum (2016)

Table 3
Levels of use in maintaining existing relationships

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
MR1	Social media platforms (Facebook, Instagram, TikTok) help me stay connected.	42.9	47.6	-	9.5	-	4.24	H
MR2	Social media helps me stay informed about the people in my life.	47.6	47.6	-	4.8	-	4.38	H
MR3	Social media enables me to communicate with people I seldom see.	14.3	61.9	4.8	14.3	4.8	3.67	MH
MR4	Social media allows me to maintain contact with my family members.	61.9	38.1	-	-	-	4.62	H

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, H: High, MH: Medium-high

Table 4
Levels of use in meeting new people and socialising

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
MS1	Social media helps me connect with new people.	33.3	42.9	4.8	19.0	-	3.90	MH
MS2	Social media assists me in finding a romantic partner.	14.3	14.3	33.3	19.0	19.0	2.86	ML
MS3	Social media is popular among my friends, so I use it too.	23.8	52.4	14.3	-	4.8	4.00	MH
MS4	Socialising is the main reason why I use social media.	19.0	23.8	28.6	23.8	4.8	3.29	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, ML: Medium-low, MH: Medium-high

not keen on using social media to develop romantic relationships with their partners (MS2), as 33.3% were neutral and 19.0% disagreed with this statement. The most agreeable statement in this factor was MS4, with a mean score of 4.00. It indicates that their peers influenced the participants to use social media.

Making Oneself Known and Popular (KP). This factor had the lowest mean score of 3.12 among all the factors. The participants mostly disagreed (47.6%) with using social media to gain popularity and show off (KP1 and KP2). In compariosn, they mostly agreed (47.6% for KP3 and 61.9% for KP4) with using social media to follow celebrities' lives and to share their status updates (Table 5).

Spending Free Time (FT). Using the media when bored (Table 6) had the highest level of use among FT2 items compared to spending free time (FT1) and for distractions (FT3), with 90.5% of the respondents agreeing.

Table 5
Levels of use in making oneself known and popular

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
KP1	Increasing my contacts for popularity is one of my goals for using social media.	9.5	14.3	28.6	47.6	-	2.86	ML
KP2	One of my motives for using social media is to create a positive impression of myself.	4.8	23.8	19.0	47.6	4.8	2.76	ML
KP3	Following the latest news about celebrities is my reason for using social media.	14.3	33.3	33.3	9.5	9.5	3.33	MH
KP4	My profile or status updates are the sole purpose of my social media usage.	19.0	42.9	14.3	19.0	4.8	3.52	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, ML: Medium-low, MH: Medium-high

Table 6
Levels of use in spending free time

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
FT1	Social media is my choice of activity during my leisure time.	14.3	38.1	28.6	14.3	4.8	3.43	MH
FT2	Boredom drives me to engage with social media.	38.1	52.4	4.8	4.8	-	4.24	H
FT3	Social media helps me escape from reality.	14.3	23.8	38.1	19.0	4.8	3.24	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, H: High, MH: Medium-high

The mean scores for FT items were high, with 3.63 as the average. The respondents' preference for social media when they have nothing else to do had the highest value of 4.24.

Functioning as Task Management Tool (MT) Aspect. The aspect scored medium-high levels for all four items except MT3 (Table 7). MT3 showed that most respondents were unsure and disagreed (71.4%) than agreed (28.6%). The respondents depend on technology for personal use compared to group activities. The overall scores revealed a moderately high agreement, with mean scores ranging from 2.81 to 3.67.

Bringing the Entertainment (EN). Table 8 shows that 90.4% of the respondents strongly agreed that social media brings entertainment, particularly in listening to music (EN2). It also keeps them entertained through online games (EN1). The media bring enjoyment when they come across funny content (71.4%) and get to share it (66.7%). There is high-frequency use of social media as an entertainment tool, with each item scoring between 3.76 and 4.29.

Providing Information and Educational Content (IE). The six items for this aspect reveal mean scores ranging from 3.10 to 4.00 (a medium-high level) (Table 9). The

Table 7
Level of use as a task management tool

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
MT1	Applications on social media help me organise my tasks.	4.8	42.9	42.9	9.5	-	3.43	MH
MT2	Social media is where I store and arrange my photos.	14.3	52.4	23.8	4.8	4.8	3.67	MH
MT3	Apps help me collaborate with others.	-	28.6	33.3	28.6	9.5	2.81	ML
MT4	I use social media to save the information of my contacts.	19.0	33.3	23.8	14.3	9.5	3.38	MH
MT5	I use social media to track the birthdays and appointments that I need to attend.	4.8	42.9	23.8	19.0	9.5	3.14	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, MH: Medium-high, ML: Medium-low

Table 8
Levels of use for entertainment

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
EN1	I use social media to play online games.	47.6	28.6	4.8	9.5	9.5	3.96	MH
EN2	I use social media to listen to music.	57.1	33.3	-	-	9.5	4.29	H
EN3	I use social media to read funny texts (such as jokes, puzzles and stories).	23.8	47.6	28.6	-	-	3.95	MH
EN4	I use social media to share photos and videos.	23.8	42.9	19.0	14.3	-	3.76	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, MH: Medium-high, H: High

Table 9
Levels of use in getting information and educational content

No.	Item	%					x̄	Level
		SA	A	U	D	SD		
IE1	I rely on social media to communicate information to others.	9.5	33.3	23.8	23.8	9.5	3.10	MH
IE2	I follow the current developments in the world using social media.	23.8	52.4	23.8	-	-	4.00	MH
IE3	I share my opinion with others using social media.	4.7	43.0	42.9	4.7	4.7	3.38	MH
IE4	My educational goals are supported by social media platforms that offer various activities.	9.5	47.6	33.3	9.5	-	3.57	MH
IE5	Social media provides me with resources on a topic of interest.	14.3	57.1	23.8	4.8	-	3.81	MH
IE6	I can access study groups via online platforms that connect people socially.	33.3	38.1	19.0	4.8	4.8	3.90	MH

Note. The 5-point scale Likert scale ranges from strongly agree to strongly disagree: strongly agree (SA) = 5, agree (A) = 4, undecided (U) = 3, disagree (D) = 2, strongly disagree (SD) = 1, MH: Medium-high

respondents' strong preference to keep updates via social media (4.00) is contrary to the striking percentages of uncertainty and disagreement towards using the media to spread information (57.1%). Also, the findings show moderately high use for academic reasons: IE4 (57.1%), IE5 and IE6 (71.4%).

Summary

The first phase's findings showed medium-high social media use among the respondents, particularly in maintaining existing relationships. This medium level is interpreted as a good indicator. The adolescents were not addicted to the media, and the reasons for using it (based on the mean scores) were primarily beneficial. However, the extent to which these disruptive adolescents behave on the media must be explored qualitatively before the study can establish the adverse consequences of social media use. Therefore, the next phase qualitatively explores the nine disruptive adolescents' Instagram postings.

Phase 2: The Adolescents' Instagram Postings

Figure 2 presents the qualitative data obtained from the nine adolescents' Instagram accounts (T1 to T9). Nine hundred seven three-month postings were coded in five themes and subthemes and analysed thematically.
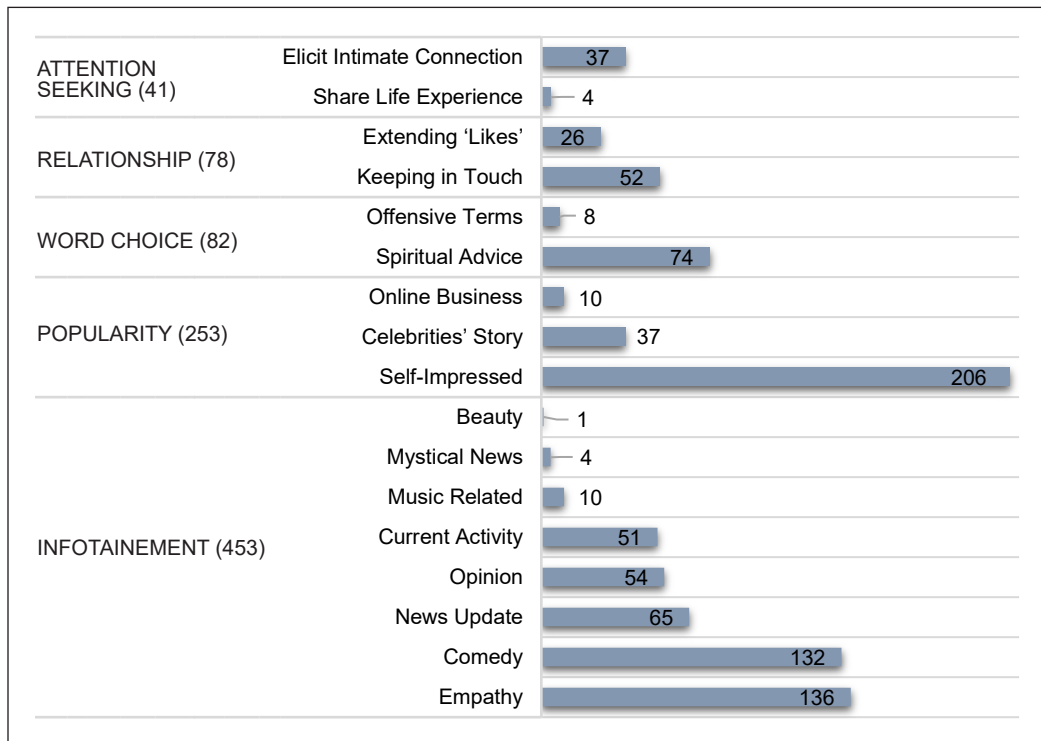
Figure 2. Instagram postings themes and sub-themes by the adolescent
Note. The 907 Instagram postings were gathered in three months (December 2021 to February 2022)

Infotainment. Infotainment' theme (453) has the most sub-themes: 'empathy' (136), 'comedy' (132), 'news update' (65), 'personal opinion' (54), 'current activity (51), 'music-related' (10), 'mystical news' (4), and 'beauty (1). T2 showed empathy by sharing and commenting on a couple's romantic conversation to show her understanding and support for emotional needs by using terms like "darling" or "B" (short for 'baby'), which are popular terms for teenage girls. T5 showed empathy by re-uploading a user's story who posted song lyrics for a broken relationship. What is intriguing is that T5 is a boy who does not mind the 'softness' part of his personality to be known to the public. What started as posting stories for infotainment to their followers leads to telling probably the sensitive part of their personalities.

For 'comedy', T3 posted a video exposing a worker who did not fast. It was later known that the company's CEO was also involved. T1 shared a hilarious video of a sleeping teenager carried out from a room by his friends. These samples showed that the teens used social media as entertainment. For 'current news,' T4 posted actual news of a scattered baby's corpse stabbed by his father, who suddenly went berserk.

Popularity. 'Popularity' has three subthemes: self-impressed (206), celebrity news (37), and business (10). 'Self-impressed' has the most frequented postings for the participants to gain popularity. For example, T1 shared a video showing how to do a self-boomerang move twice. T5 also used his Instagram account to post a story with a question box that said 'drop your number'. The purpose of these posts was to get more new contacts.

'Celebrity stories' is another frequent sub-topic posted by the participants. T3 shared a story about a local celebrity, criticised by some K-pop fans. T7 posted about an actor who tested positive for COVID-19. 'Online business' has postings on beauty products uploaded ten times by T3 in her account story. She is probably an agent or drops ship for the products which use the product's popularity to attract potential customers. Customers who want to know more about the products or place orders might become her new followers, making her more popular apart from gaining some sales profits.

Word Choice. Two opposing subthemes are spiritual advice (74) and offensive language (8). The teenagers posted stories about *doa* (prayer) to embrace the coming of Ramadhan, a blessed month for Muslims. The *doa* is shared with their followers so others can use it to gain more rewards. T4 shared about ten chapters of the Qur'an describing how the Prophet Muhammad SAW overcomes his melancholy by performing ablution, being optimistic, having positive thoughts about Allah SWT (God), and quickening to conduct prayer. Additionally, T2 narrated the sunnah of fasting on Monday and Thursday to gain Allah SWT's pleasure and educate humans with noble qualities.

In contrast, the adolescents were also identified as choosing offensive remarks (8). Some posts contained obscene gestures, swear words and profane words. Specifically, the postings had pornographic signals (5), swear words (2), and vulgar words (1). For example, there was a pornographic gesture where T8 uploaded a video of herself with the middle finger gesture or the foul language *fuck*. In addition, T7 uploaded a story in which she was uttering swear words, *shit* when cursing herself.

About Relationships. Seventy-eight postings about relationships were identified and categorised into two sub-themes, 'keeping in touch (52) and 'sharing 'likes' (28). The participants use eight Instagram features like 'repost' stories when other participants tag them and 'ask me a question to indicate a 'keep in touch' move. The features allow the participants to share personal information, mention important dates, and recall memories.

Extending the 'likes' sub-theme is more of nurturing the relationship. The teens are eager to do anything to increase their number of followers or 'likes' from their friends. They want to be as popular as other participants who have more followers. T7 supported her friend by giving her more contacts or likes from her Instagram followers. She also reposted the pictures or videos her friends uploaded to their stories. She tagged them with enticing comments such as "antiknya b" (so beautiful b—a short form for baby) and "hmm lawo" (beautiful) to attract the interest of her followers. The

posting appeared 26 times in the story on the theme of relationships.

Seeking Attention. 'Seeking attention' has the lowest number of posts (41). The participants used social media to seek or attract their followers and the public's attention by constantly 'liking' newly uploaded statuses and looking forward to opportunities to add a new contact. The 'seeking attention' has two subthemes: 'sharing life experience' (4) and 'eliciting romantic connection' (37). The participants shared their life experiences through their relationship stories and statuses to attract attention. When T3 shared his stories with his partner, he quickly got 'likes' from his followers, and when there were new people 'likes,' the others started to exchange chats and eventually numbers. It also reflects the type of T3 followers who mutually seek attention by 'liking' and pursuing new contacts or followers. The echo chamber also appeared four times by T6.

The subtheme of 'eliciting intimate connection' (37) is strongly connected with seeking attention. T4 connected with many couples through stories uploaded with Instagram tags belonging to their partner. T8 liked to make fun of her partner by pretending to be in dramas, such as calling her little brother their child and using phrases like "*papa derah gok balik anok jerik ey haha haha*" (papa come back quickly your child is screaming/crying). She also 'encouraged' the partner's sweet words using words such as "goodnight b" (baby)," "dear," and many more. These phrases,

which sounded like a married couple's conversation, denote the participant's pursuit of attention to a specific person.

Summary

The adolescents used Instagram during the pandemic to establish social attachments. With the current situation's limitations, cost and time constraints for a get-together, social media has become their choice to keep up with their friends' stories and updates. Indeed, keeping in touch with people you know is essential as it balances your emotions (Jiang et al., 2020). The study's qualitative data proved that maintaining the existing relationship is crucial to these students—evidence of social attachment where social media has made attaching to something familiar more stress-free. Technology affords more conveniences in its effort, space, and time flexibility, instigating adolescents' preference for social media during their free time.

A thought-provoking conclusion can be drawn from the study's conflicting quantitative and qualitative findings. It was earlier identified that 'Making Oneself Known and Popular' had the lowest agreement (3.12) (Table 2). However, the later exploration shows that the subtheme 'self-impressed' under the theme 'Popularity' has the most frequent postings (206) (Figure 2). The matter confirms the immaturity of the adolescents' impulse control and response expressions, leading to poor decision-making (Brown & Wisco, 2019). The notion fortifies our argument on the need for close monitoring and controlled media use for the sample.

Moreover, a closer analysis also presented the adolescents' disruptive behaviours when sharing derogatory postings. The study found that when pressured, adolescents lashed out their emotions and dissatisfaction on Instagram. Being verbally disruptive online to escape loneliness or stress during the pandemic is explained in the social attachment model. Increased sensitivity and tendency towards deviance, social exclusion, scapegoating, and hate crime are conditions perceived as familiar but not objectively safe (Mawson, 2005). If caught, an individual may be subjected to legal and regulatory repercussions.

Also, sharing derogatory content without considering its potential effects can lead to serious legal issues (Daud & Zulhuda, 2020) and personal ramifications in the future (Criss et al., 2021). Individuals may face legal consequences if their shared content violates privacy laws (Kadian & Krishan, 2022). In addition, prospective employers may routinely conduct online searches to vet potential candidates, and a history of sharing malicious or offensive content can damage one's reputation and limit opportunities (Eischen, 2021). Hence, they need to be mindful of the potential impact and think twice before sharing content that may have negative implications. The information on fines, lawsuits, and criminal charges related to the improper use of media should be clear to adolescents, just like other physical crimes.

On a positive note, adolescents used the media to share religious, motivating and practical guidance during the pandemic. Generally, there were more postings with positive words than offensive ones (Figure 2). The findings highlight the participants' awareness and effort to extend positivity based on religious reminders and practices for each other's benefit. Posting spiritual guidance, a form of attaching to religious principles sources, was again consistent with Mawson's model. Also, the result concurred with the rising socio-religious movement in the digital space to the activism of Muslim users online (Nawi et al., 2020). The spiritual awareness presented by this disruptive group of adolescents revealed their beliefs in Islamic practices.

CONCLUSION AND IMPLICATIONS

This exploration of disruptive adolescents' behaviour on social media is significant today to understand how the media causes adverse consequences to netizens, particularly during times of crisis. The study identified the adolescents' use of media and the extent of utilisation that might trigger their aggression. The adolescents showed average time spent on the media during the pandemic, equating to minimal verbal disruptive behaviours detected. The dominant use of the media is to interact with familiar individuals, which is aligned with the social attachment theory. However, familiarity does not deter them from using negative terms when triggered and self-impressed to seek popularity. In addition,

the adolescents' spiritual awareness could anchor their self-control mechanisms when using the media and as an echo chamber for their followers' positive media use.

This apparent sign of social media's indispensability towards adolescent life today should have caused stern involvement from various parties. Related government sectors, mainly through education and sports, should level up strategies and initiatives to inculcate ethical practices and beneficial use of social media from a young age. Moreover, parental involvement and increased role are vital in modelling positive media use and a healthy social environment. Also, understanding SIT might help teachers improve adolescents' deviant behaviour because the theory promotes youngsters' positive social identities when using social media. Since adverse consequences of social media can result in negative publicity and damage a person's reputation, any negativity or misbehaviour should be prevented as the action can quickly get viral and publicised. It could become even more unfortunate if the act tarnishes one's digital footprint, leading to a lifetime of regret. Hence, controlling or limiting their usage time will significantly help them not become addicted to using the media.

Future studies should explore how disruptive behaviour varies across social media platforms and how those platforms may contribute to mitigating this behaviour. Research could focus on developing and testing interventions to reduce or prevent misbehaviour on social media. The measure could include examining the

effectiveness of educational programs, peer-led interventions, and platform-based interventions. Furthermore, there is a need to explore social media use through longitudinal or ethnographic studies to confirm the specific behaviour changes during the crisis. The results can help plan better strategies for future situations that are similar.

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Professional Leadership Competencies for Malaysian Educational Middle Leaders

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ABSTRACT

The quality of education is heavily influenced by the professionalism of teachers and the effectiveness of educational leadership. Previous studies have examined educational leadership, and most concentrate on the roles of principals and head teachers. There is a need to delve into a more comprehensive examination of leadership by middle leaders who served as the backbone of the educational system to improve the education quality in the country. Thus, this study aims to establish a consensus among experts regarding the construct of professional leadership competencies for middle leaders in matriculation colleges, employing the Fuzzy Delphi Method (FDM). An instrument comprising elements related to professional leadership competencies was administered to a panel of 30 experts from diverse fields. The study's outcomes reveal the agreement among expert panels concerning the proposed constructs and elements of professional leadership competencies. All 13 elements met the condition of $d \leq 0.2$, achieving expert agreement exceeding 75% with values ranging from 93% to 100%. The alpha-cut values also exceeded 0.5 (α-cut $\geq$ 0.5), ranging from 0.886 to 0.940. Through the defuzzification process facilitated by FDM, all elements were ranked according to the hierarchy established by the experts. This

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study introduced a novel construct related to professional leadership competencies, specifically to educational middle leaders.

INTRODUCTION

Excellence in the education system is highly dependent on two elements: a strong teaching profession and educational leadership (Hargreaves & Shirley, 2018; Musa & Halim, 2015). Student achievement and educational success are also influenced by the quality of educational leadership (Hargreaves & Shirley, 2018; Leithwood, 2019). The Malaysian government also gives the quality of educational leadership special attention through the Malaysian Education Blueprint (MEB) 2013-2025 (Ministry of Education [MOE], 2013). The fifth shift in the MEB outlines the need for educational institutions to have quality leaders and support leaders to ensure that the excellence of educational institutions can be achieved (MOE, 2013). In line with that, the scope of educational leadership needs to be seen in a more holistic context. Studies related to the leadership of principals/head teachers are often discussed (Grootenboer, 2018; Harris et al., 2018), including those related to their level of competence in leadership. For example, the KOMPAS Model or school leadership competencies has been provided as a guide for measuring the competencies of principals and head teachers (MOE, 2009). Studies to deepen understanding of leadership are very much needed (Rami et al., 2021).

The excellence in leadership and administrative capability of educational leaders with good and efficient leadership styles is necessary (Bhattacharyya, 2019). However, educational leadership is not only focused on the organization's key leaders, i.e., directors or principals/head teachers alone, but also refers to the role and involvement of middle leaders (De Nobile, 2017; Ekaterini, 2011; Beram et al., 2022). These middle leaders include senior assistant teachers, the head of panatia, the head of the department, the head of the unit, or even the subject coordinator. Middle leaders play a major role in achieving the organization's goals, especially ensuring education's smoothness, effectiveness, empowerment, and viability. The position of middle leaders within the organization, being at the center of the leadership layer, allows them to be the liaison between top leaders and educators more effectively (Ding et al., 2019; Grootenboer, 2018; Thorpe & Garside, 2017).

Middle leaders need to lead their groups at the departmental or unit level, and at the same time, they also lead the curriculum (Bassett & Show, 2017). These two roles cause middle leaders to need high professionalism (Bassett & Shaw, 2017; De Nobile, 2017; Gurr, 2018; Wei, 2018). Middle leaders are officers appointed to specific positions reserved within an organization (De Nobile, 2017; Gurr, 2018). It causes middle leaders to have additional skills (Irvine & Brundrett, 2016) outside the pedagogical context. They need leadership and management competencies (De Nobile,

2017; Gurr, 2018; Irvine & Brundrett, 2017; Roselena & Mohd Izham, 2015). The development of leadership competencies is crucial in coping with changes and the environment of educational organizations (Effendy, 2015; Beram et al., 2020), as well as adaptation to different cultures and task functions (Boyatzis & Ratti, 2009). Thus, excellent middle leaders require strong professional leadership competencies (Intang & Shariff, 2019; Stogdill, 1974).

Competency-oriented human resource management is critical, especially in education (Ismail et al., 2018; Beram et al., 2021). Thus, educational organizations need to empower and improve aspects of human resources, especially involving middle leaders. However, studies related to middle leaders' functions, roles, needs, and competencies are still much lower than studies involving principals/head teachers (Grootenboer, 2018; Harris, 2018). Studies related to middle leaders found only 49 articles published in ISI and Scopus between 2007–2017, covering Europe, Asia, the Middle East, North America, and other countries (Harris et al., 2019). These findings clarify that there is still a need to examine and understand the importance of these middle leaders, particularly in education.

To achieve the goal of creating quality education as well as boosting educational excellence, competency practices among middle leadership also need to be given attention (Deli, 2018; McKenzie & Varney, 2018; Razak, 2017). Nevertheless, middle leaders experience various difficulties in performing their leadership duties effectively. They become a sandwich between executing top management instructions and maintaining relationships with colleagues (Branson et al., 2016; McKenzie & Varney, 2018;). Developing specific competencies for middle leaders is crucial (Grootenboer, 2018; Gurr, 2018; Razak, 2017; Roselena & Mohd Izham, 2015; Wei, 2018). In this regard, this study was conducted to develop a competency model of middle leaders in educational institutions in Malaysia.

LITERATURE REVIEW

Competence is the rational behavior of individuals to achieve organizational goals that transcend educational and intellectual levels (Prasertcharoensuk et al., 2015). Competence also refers to an individual's experience, wisdom, and ability to perform a task (Boyatzis, 2011) by using a combination of possessed knowledge, skills, behaviors, and attitudes effectively (Slocum et al., 2008). More interestingly, however, competencies can differentiate the competence of one individual from that of other individuals, including this middle leader (Boyatzis, 1982; Spencer & Spencer, 1993; Beram et al., 2021). Leaders who master the set competencies can exhibit and produce more excellent performance compared to those who lack mastery of the competency aspects (Siraj & Ibrahim, 2012).

Existing Competency Model

In Malaysia's education context, the Aminuddin Baki Institute has developed several competency models as a reference

for educational leaders. The Malaysian School Principalship Competency Standard (SKKSM) (2006) was developed as a guide for principals and headmasters of schools in Malaysia. SKKSM covers nine aspects of management that all principals and headmasters must master. Meanwhile, the School Leadership Competency Model (KOMPAS) (2009) contains six main domains that also target the leadership competencies of principals and head teachers. A summary of the components of these two models is in Table 1.

The SKKSM model was developed to strengthen the professionalism of principals and headmasters through a specific guide that can be referred to in performing their duties. Meanwhile, the KOMPAS Model is provided to develop a high-impact level of competence among principals and headmasters (Deli, 2018). However, this competency model focuses on the daily management aspects of principals and headmasters that are functional and exclusive to use in schools managed by MOE. Therefore, a specific competency model was developed for the reference

and use of principals and head teachers in Malaysia's education system. However, the model developed is very specific to the competencies and roles of principals and head teachers as key leaders of school organizations. This model does not include other leadership groups within the school environment, such as senior assistants, field heads, and unit heads. Whereas leadership in an organization, including schools, is not focused on key leaders only (De Nobile, 2017; Ekaterini, 2011; Slocum et al., 2008).

Literature of Middle Leadership

Meanwhile, there is still a lack of research done on middle education leaders (Grootenboer, 2018; Gurr, 2018; Beram et al., 2022), including in the development of middle leader competency models (De Nobile, 2017; Razak, 2017). Competency development among middle leaders can ensure that outstanding and potential leaders in the future (Razak, 2015). At the same time, these middle leader competencies need to be developed because the success and excellence of an educational institution require the overall

Table 1
SKKSM and KOMPAS model components

No.	SKKSM Components (2006)	KOMPAS Domain (2009)
1.	Organizational Management and Leadership	Policy And Direction
2.	Curriculum Management	Instructional and Achievement
3.	Co-curricular Management	Managing Change and Innovation
4.	Management of Student Affairs	Interpersonal Relationships
5.	Financial Management	Sources and Operations
6.	Office Administration Management	Self-Efficacy
7.	Environmental Management and Physical Facilities	
8.	Human Resource Management and Development	
9.	External Relations Management	

commitment of the existing leadership group (Deli, 2018; McKenzie & Varney, 2018). The middle leaders play a role in mobilizing operations to achieve the vision and mission of the organization through their role as a liaison between top leaders and officers under their control (Branson et al., 2016; Grootenboer, 2018). The middle leader performs the function bilaterally, i.e., up and down simultaneously. This situation makes the role of middle education leaders increasingly complex as they have to manage curriculum, perform administrative work, and implement current policies as directed, but at the same time, they also teach and need to ensure student outcomes (Harris et al., 2018).

Tracing the competencies of middle leaders, Thornton et al. (2018) explained that the competencies of middle leaders in universities are not the same as those of school leaders due to different leadership contexts and needs. Middle leaders in universities are particularly important in supporting faculty and universities, but the dual roles of administrators and lecturers cause their roles to be limited (Branson et al., 2016). Some middle leaders are still incompetent in performing tasks based on their university management assessment (Junaidah & Saodah, 2013). Therefore, a specific model for using middle leaders in higher education should also be created to guide these middle leaders (Beram et al., 2022). The issue of middle leader competence in education does not only occur at the school level but also involves universities.

Lan and Hung (2018) suggested that middle leaders need to master competencies in the context of self-development competencies, professional competencies, human resource competencies, and competencies in the context of regional (cultural). The study by Razak (2017) found 13 critical competencies required by senior assistant teachers of school administration in Malaysia. These competencies include self-awareness, social awareness, communication, problem-solving, teamwork, and instructional development. Razak (2017) also found that differentiating competencies cover professional aspects such as supervision, curriculum-focused, performance management, and ICT management, which these middle leaders found to be less mastered.

Furthermore, Muhamad Yusoff et al. (2014) study found that self-management competencies, relationship management, self-awareness, and emotional competencies become the catalyst for the development process and selection of school leaders. The components of competence expressed as critical by scholars depend on the context and organizational environment involved in their study. Spencer and Spencer (1993) pioneered the Iceberg Competency Model. They explain that competence depends on how an individual thinks, acts, and copes with various situations through motives, traits, self-concepts, knowledge, and skills. While the researchers before them, Boyatzis (1982), through the Model of an Effective Job Performance, has emphasized competencies into three main

clusters: individual, job, and organizational. Job competence (Boyatzis, 1982) is closely related to professional competence, which covers a leader's duties, functions, and roles.

Professional Competencies

Professional leadership competency refers to the ability of mid-level leaders to perform functional tasks involving authentic routines listed in the job description. As educational leaders, the Teacher Professionalism Division (2023) emphasizes that teachers need to demonstrate professionalism as defined by the MOE. In addition to functional aspects of teaching and learning, mid-level educational leaders must also be knowledgeable in office management and human resources (Schum et al., 2018), which are new skills beyond pedagogy (Irvine & Brundrett, 2017). Therefore, this competence needs to be developed, especially among novice mid-level leaders.

Based on the Iceberg Competency Model and the Model of Effective Job Performance, which are often referred to by many researchers of competency aspects (Razak, 2017: Tengku, 2016), it can be summarized that the professional competence component (functionality) becomes a competency that is stated as very important (Ibrahim et al., 2019). As a middle leader, the areas of responsibility that need to be implemented are not focused on management and administration but also include teaching, learning, and curriculum management (Basett & Show, 2017; De Nobile, 2017; Gurr, 2018;). This professional leadership competency is also clearly stated

in the Malaysian Teacher Standards 2.0 (Teacher Professionalism Division, 2023), which emphasizes that as teachers, these middle leaders still need to practice the aspects of professionalism standardized by the MOE.

MOE also pays special attention to professional leadership in the Integrated Assessment of Education Service Officers (MOE, 2013), covering the group of middle education leaders. Emphasis on aspects of professional competence among middle leaders needs to be given more comprehensive attention (Intang & Shariff, 2019), especially in developing the competency model of middle leaders, which is the goal of this study. Therefore, this study was conducted to answer whether there is expert agreement on the elements of professional leadership competencies that need to be included in the Middle Leader Competency Model construct.

METHODS

This study aims to realize the development of the MOE Matriculation College Middle Leader Competency Model. For that purpose, this study was conducted using Design and Development Research (DDR) by applying three phases: the needs analysis phase, the design and development phase, and the usability assessment phase (Richey & Klien, 2007; 2014). DDR allows research to be conducted using multiple methods (Siraj et al., 2020), with each phase utilizing different methodologies. The study in this development phase involves data collection using the Fuzzy Delphi Method (FDM)

technique to obtain expert agreement on the elements in the construct of the developed model. FDM can be used to identify, validate, evaluate, and justify the key elements of the construct in the model development process (Ridhuan et al., 2017; Yoong et al., 2022).

This study also applied the FDM technique introduced by Murray et al. (1985) and reviewed by Kaufmann and Gupta (1988). FDM combines fuzzy set numbering or fuzzy set theory applied in traditional Delphi techniques. The FDM technique is an improved and rebranded measurement method based on the conventional Delphi method (Ridhuan et al., 2018; Siraj et al., 2020). Thus, this method is not new but has been widely used in various research fields that require experts' agreement in the aspects studied (Chang et al., 2011; Yoong et al., 2022).

Zadeh (1965) introduced the concept of 'linguistic variables,' which is to convert words into quantitative values that are easily measurable, especially in solving critical problems (Ding et al., 2019; Ridhuan et al., 2018). The fuzzy set theory allows linguistic variables to be interpreted gradually for each element in a set, and the values contained in this Fuzzy set range from 0 to 1 or in intervals (0.1) (Ding et al., 2019; Zadeh, 1965). The strength of FDM in interpreting linguistic variables to quantitative values allows it to be a more effective measurement tool and solve problems that have uncertainty in a study (Ridhuan et al., 2018). Many researchers have also used FDM, especially in decision-making, including human resource-related fields (Ding et al., 2019). There are two main things in FDM: the Triangular Fuzzy Number and the Defuzzification Process. Triangular Fuzzy Number has 3 values (m1, m2, m3): minimum, most reasonable, and maximum. While defuzzification allows ranks (rankings) to be given to elements based on expert agreement. Expert consensus is achieved when the Triangular Fuzzy Numbers meet the threshold criteria (d) ≤ 0.2, and the expert agreement percentage is ≥ 75%. Meanwhile, the defuzzification criterion is met when the alpha-cut value (α-cut) is ≥ 0.5 (Siraj et al., 2020).

Research Samples

This study was conducted using the FDM technique by involving a total of 30 experts in the field of leadership and competence (Jones & Twiss, 1978; Siraj et al., 2013) who were purposefully selected based on their experience (Cohen et al., 2018) in middle leadership. Rossett (1987) also explained that selecting a sample based on experience and knowledge can provide effective and useful information for the needs of the study. Sampling in Delphi-based techniques cannot be statistically obtained because it requires the involvement of experts who need to be identified first (Adler & Ziglio, 1996). Further, questionnaires containing competency elements were distributed to experts appointed from among university lecturers, senior MOE officials, teacher education institute lecturers, vocational college directors, matriculation college middle leaders, district education officers,

principals, and middle leaders from six colleges. The expert panel was asked to state their level of agreement on the main construct based on the seven-point Likert scale, which has been translated to the Fuzzy scale. Next, the data obtained needs to be analyzed using the Fuzzy Delphi linguistic scale.

Research Instruments

Using FDM techniques, instruments were formed based on literature highlights, pilot studies, or experience (Skulmoski et al., 2007) or using literature highlights, expert interviews, or nominal group techniques (Ridhuan et al., 2014; Siraj et al., 2020). Based on this view, a questionnaire instrument was prepared through the agreement of FDM 1 experts, which has been implemented in advance. The instrument of this study uses a seven-point scale to describe the value of the Fuzzy linguistic scale. This scale is then translated to the value of the Fuzzy set scale. Fuzzy sets interpret each element in them in unit intervals ranging from 0 to 1 (Ding et al., 2009). Triangular Fuzzy Numbers refer to m_1, m_2, and m_3 Values in this FDM technique. The value of m_1 represents

the minimum value, m_2 represents the reasonable value, and m_3 represents the maximum value (Table 2).

Based on Table 2, when an expert chooses a value such as a scale of 7, this value has been translated into a Fuzzy scale based on the values of m_1 (0.9 = 90% likely agree), m_2 (1.0 = 100% likely agree) and m_3 (1.0 = 100% likely agree). In other words, the higher the selected Fuzzy scale, the higher the level of agreement and accuracy of the data obtained (Hassan et al., 2018).

Based on the explanations related to the Fuzzy Delphi processes mentioned, the questionnaire presented was to assess expert agreement on the main constructs of the Matriculation College Middle Leader Competency Model. The elements for the professional leadership competency construct of this study are shown in Table 3.

The list of professional competency elements was obtained from a literature review using existing competency models and combined with findings from interviews with six educational leadership experts in the first phase of the study. Therefore, a questionnaire containing these 13 elements was distributed to 30 experts,

Table 2
Scale of fuzzy linguistic variables

Instrument Scale	Linguistic Variables	*Triangular Fuzzy Numbers* (m_1, m_2, m_3)
7	Very strongly agree	(0.9, 1.0, 1.0)
6	Strongly agree	(0.7, 0.9, 1.0)
5	Agree	(0.5, 0.7. 0.9)
4	Moderately agree	(0.3, 0.5, 0.7)
3	Disagree	(0.1, 0.3, 0.5)
2	Strongly disagree	(0.0, 0.1, 0.3)
1	Very strongly disagree	(0.0, 0,0, 0.1)

Note. Sources by Siraj et al. (2020, p. 186)

Table 3
Elements of professional leadership competencies

No.	Elements of the professional leadership competencies construct tested	Source of elements	New elements
1	Understanding colleague	Boyatzis (1982)	
2	Decision making	Slocum et al. (2008)	
3	21st Century Teaching and Learning (TnL)	Hoy and Miskel (2008)	
4	Work quality	Boyatzis (1982)	
5	Monitoring	Slocum et al. (2008)	
6	Data-driven decision making	Expert interviews	/
7	Take responsibility for decisions	Slocum et al. (2008)	
8	Report writing	Expert interviews	/
9	New knowledge skills	Expert interviews	/
10	Ability to lead	Expert interviews	/
11	Creativity	Spencer and Spencer (1993)	
12	Mentoring	Slocum et al. (2008)	
13	ICT skills	Hoy and Miskel (2008)	

and the findings were analyzed using the formulas of Triangular Fuzzy Numbers and Defuzzification.

RESULTS

The study of developing this Middle Leader Competency Model was conducted using the Fuzzy Delphi technique, involving 30 experts. The demographic distribution of the panel of experts involved is shown in Table 4.

Table 4 shows the demographic information of the panel of experts involved in developing this Middle Leader Competency Model. A total of 30 purposefully selected panels of experts provided feedback through the FDM questionnaire submitted. A total of 12 (40%) experts have more than 20 years of experience in education management, followed by a total of 10 (33%) experts who have between 16 to 20 years of experience, and 8 (27%) have between 11 to 15 years of experience in education management. Of the total, it was found that 40% (12) experts hold positions in the top management group of educational organizations, while the remaining 60% (18) experts hold positions as middle leaders. From the aspect of the working location, it was found that 10 (33%) experts served in MOE, 8 (27%) experts from matriculation colleges, followed by 5 (17%) experts each from public universities and state education department/education department district/ institute of teacher education. While 2 (6%) experts represent vocational colleges/form 6 colleges. Furthermore, the information on the highest academic qualifications of the panel of experts involved showed that 11 (37%) experts have a Master's Degree, followed by 10 (33%) who have a Bachelor's Degree, and a total of 9 (30%) experts hold a Doctor of Philosophy Degree. The selection of expert panels from various educational institutions can avoid bias and

Table 4
Demographic distribution of FDM expert panel

Item	Category	Number	Percentage
Experience in education management	5–10 years	0	-
	11–15 years	8	27
	16–20 years	10	33
	More than 20 years	12	40
Current position	Top management	12	40
	Middle management	18	60
Latest place of work	Malaysia's education camp	10	33
	Public university	5	17
	Matriculation college	8	27
	JPN, PPD, IPG	5	17
	Vocational college/Form 6	2	6
The highest academic qualification	Doctor of philosophy Degree	9	30
	Master's degree	11	37
	Bachelor's degree	10	33

generate a more comprehensive view for developing this competency model.

Next, an analysis of the study findings was performed by testing the agreement of the expert panels on the proposed constructs and elements in professional leadership competencies. The tested elements were obtained by mapping one theory and four competency models, followed by the proposal of new elements by six informants in the needs analysis phase. A total of 13 items were presented as elements of professional leadership competencies in the development process of this Middle Leader Competency Model. To obtain expert panel agreement, the first condition to be met using FDM is that the threshold value must be less than or equal to 0.2 ($d \leq 0.2$). The analysis of threshold value data obtained through the Fuzzy Delphi instrument involving 30 experts is shown in Table 5.

Table 5 shows that the average threshold value 'd' for each element tested is qualified ($d \leq 0.2$). All 13 elements of the professional competence of middle leaders tested obtained a threshold value (d) based on expert agreement less than the set threshold value ranging from 0.060 (item 10) to 0.116 (item 11). Therefore, all 13 of these elements were accepted as constructs of the professional competence of mid-matriculation college leaders. Overall, the threshold value 'd' for the professional leadership competency construct is 0.008. The obtained value also satisfies the threshold condition ($d \leq 0.2$). Directly, these findings indicate that expert agreement has been reached for the constructs and elements tested. Accordingly, the analysis of the study can be continued by looking at the compliance of the expert agreement percentage requirement (Ridhuan et al., 2017). After the threshold value (d) is obtained, further research is needed to test the percentage of expert agreement on the elements tested.

Table 5
Threshold value 'd' based on expert consensus

Experts	Items												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	0.069	0.088	0.066	0.090	0.097	0.102	0.061	0.071	0.051	0.041	0.041	0.069	0.057
2	0.086	0.088	0.066	0.063	0.056	0.102	0.061	0.083	0.051	0.112	0.041	0.326	0.057
3	0.086	0.088	0.088	0.090	0.097	0.102	0.093	0.083	0.051	0.112	0.041	0.084	0.057
4	0.069	0.066	0.066	0.063	0.056	0.102	0.061	0.071	0.290	0.041	0.274	0.069	0.096
5	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
6	0.086	0.088	0.088	0.090	0.097	0.102	0.093	0.083	0.051	0.112	0.041	0.084	0.057
7	0.086	0.066	0.088	0.090	0.097	0.051	0.061	0.322	0.290	0.041	0.274	0.084	0.299
8	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.051	0.041	0.120	0.069	0.096
9	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
10	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
11	0.323	0.327	0.088	0.090	0.097	0.102	0.093	0.083	0.051	0.112	0.274	0.084	0.057
12	0.069	0.066	0.088	0.090	0.056	0.051	0.061	0.083	0.051	0.112	0.120	0.084	0.057
13	0.069	0.066	0.088	0.063	0.056	0.051	0.061	0.083	0.051	0.041	0.120	0.069	0.057
14	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
15	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
16	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
17	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
18	0.069	0.066	0.066	0.090	0.097	0.051	0.093	0.071	0.051	0.041	0.041	0.069	0.057
19	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
20	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
21	0.612	0.327	0.327	0.331	0.056	0.051	0.332	0.071	0.104	0.041	0.274	0.069	0.096
22	0.086	0.088	0.066	0.063	0.097	0.102	0.061	0.071	0.104	0.041	0.041	0.084	0.057
23	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.083	0.051	0.041	0.041	0.084	0.057
24	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.041	0.084	0.057
25	0.086	0.088	0.088	0.090	0.097	0.102	0.093	0.083	0.051	0.112	0.041	0.084	0.057
26	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
27	0.069	0.066	0.066	0.063	0.056	0.051	0.061	0.071	0.104	0.041	0.120	0.069	0.096
28	0.086	0.088	0.088	0.090	0.097	0.102	0.093	0.083	0.051	0.112	0.041	0.084	0.057
29	0.069	0.088	0.327	0.063	0.097	0.102	0.332	0.322	0.290	0.112	0.274	0.084	0.299
30	0.069	0.066	0.066	0.090	0.097	0.051	0.093	0.071	0.051	0.041	0.041	0.069	0.057
'*d*' value	**0.100**	**0.089**	**0.089**	**0.081**	**0.071**	**0.068**	**0.086**	**0.091**	**0.100**	**0.060**	**0.116**	**0.083**	**0.092**
Construct average							**0.008**						

Table 6 summarizes the expert consensus analysis on the constructs and elements of professional leadership competencies for middle leaders. FDM analysis showed that after the elements were tested, it was found that the expert agreement values ranged from 93.3% (items 1, 2, 3, 7, and 8) to 100% (items 5, 9, 10, and 11). Items that obtained 100% agreement indicated that all 30 expert panel members agreed these items were highly important for middle leaders. Therefore, all 13 tested elements that met the expert agreement requirement of greater than 75% were accepted.

After the two FDM conditions are met, further testing is performed by defuzzification analysis to determine the ranking of each element. The fuzzy score (A) analysis obtained ranged from 0.886 to 0.940. The values obtained from the defuzzification process show that all elements met the third condition: the value exceeding (α-cut ≥ 0.5). As such, all tested elements are accepted by a group of experts, and further, this process allows ranking settings to be performed. Table 7 shows the ranking of the personal leadership competencies of middle leaders after the ranking process was calculated.

The re-ranked element in Table 7 shows that the leadership ability element obtained the highest fuzzy score (A) value

in the middle leader professional leadership construct with a defuzzification value = 0.919, followed by a data-based decision element with a defuzzification value = 0.933. The next element in the third important position is monitoring, with a defuzzification value = 0.930, while taking responsibility for decisions becomes the fourth important element with a defuzzification value = 0.932. At the same time, the element's work quality was evaluated by an expert panel with defuzzification = 0.926. Next, the decision-making element and 21st-century TnL are on the same rank as the fifth important element with a defuzzification value = 0.922. The determination of the rank of importance of

Table 7
Element rankings based on expert consensus

No.	Elements of the professional leadership competencies construct tested
1	Ability to lead
2	Data-driven decision making
3	Monitoring
4	Take responsibility for decisions
5	Work quality
6	Decision making
7	21st Century Teaching and Learning (TnL)
8	Mentoring
9	Understanding colleague
10	Report writing
11	ICT skills
12	New knowledge skills
13	Creativity

Table 6
Summary of expert consensus analysis on professional leadership competencies

Item	1	2	3	4	5	6	7	8	9	10	11	12	13
Agreement (%)	93.3	93.3	93.3	96.7	100	100	93.3	93.3	100	100	100	96.7	100
Fuzzy score (A)	.919	.922	.922	.924	.930	.933	.926	.919	.897	.940	.886	.921	.902
Ranking	9	6	6	5	3	2	4	9	12	1	13	8	11

this element continues until the element in the 13th position, which is creativity, obtains the value of defuzzification = 0.886. From this defuzzification process, it is found that all elements pass the specified condition that the defuzzification value must be equal to or exceed the value of 0.5 (α-cut $\geq$ 0.5).

DISCUSSION

This study has developed an FDM questionnaire instrument to validate the constructs and elements of professional leadership competencies of middle leaders based on literature highlights (Skullmowski et al., 2007; Siraj et al., 2020) and interviews (Ridhuan et al., 2014). All the elements contained in this professional competency construct were derived from one theory and four competency models, as well as the findings of expert interviews. Mapping existing theories and models forms the basis for developing competency-based research instruments. Therefore, the findings of this study also confirm the ability of the instrument developed to measure the competence of professional leadership in the context of educational institutions in Malaysia. A threshold value of 'd' less than 0.2 for constructs and elements confirms expert agreement on the tested items. In other words, experts have a high level of understanding (Adler & Ziglio, 1996) even though they are not face-to-face when answering the instruments of this study.

The findings of this study also confirm four new elements incorporated into the construct of professional leadership competencies. These new elements were included based on expert interviews in the needs analysis phase. These four new elements were also found to have high agreement values. The relevant elements were leadership ability ($d = 0.060$), data-based results ($d = 0.068$), report writing ($d = 0.091$), and new knowledge skills ($d = 0.10$). A threshold value of less than 0.2 explains a high level of agreement on the consensus of a 30-member panel of educational leadership experts. It clarifies that middle leaders' professional competencies need to be augmented with knowledge and skills appropriate to adding these already validated elements. This statement is aligned with the views of Grootenboer (2018), who explains that mid-level leaders require specific knowledge and skills to succeed in their roles.

In addition, the expert panel also confirmed all 13 elements tested. It is found that middle leaders need professional leadership competencies to face challenges in performing their duties effectively, with threshold values ranging from 0.060 to 0.116. The expert agreement value on the professional leadership competency construct obtained through FDM was 0.008 and smaller than the threshold value ($d \leq$ 0.2), indicating that this competency was highly significant with middle leaders. At the same time, each element's expert agreement percentage is between 93.3% and 100%. Meanwhile, the fuzzy test score (A) was between 0.886 and 0.940, indicating the level of acceptance of all elements tested above the α-cut value of 0.5.

The study also successfully rearranged the 13 elements tested based on the rank values obtained from the expert consensus. The test results showed that the 10th element from the initial list was given the highest rank and changed position as the first element in this developed professional leadership competency construct. The creativity element, the 11th element in the initial list, changes position as the last element in this construct. This process is performed on all 13 elements according to the priority list from the first to the 13th ranking. Therefore, the FDM technique used is very suitable for decision-making (Ding et al., 2019) related to the elements of professional leadership competence for the middle leader. FDM simplifies the decision-making process and allows for the ranking of elements. The organization of these ranks has made it easier for middle leaders to improve their knowledge and skills to master professional leadership competencies in stages.

The findings of this study confirm that professional leadership competence is one of the important constructs of middle leaders. This study's findings are slightly different from competency studies conducted by previous researchers (Boyatzis, 1982; Spencer & Spencer, 1992; Slocum et al., 2008) because they focus on leadership competencies in general and emphasize more on the organization. The emphasis on competency aspects, specifically to middle leaders, is rarely given attention. Therefore, the findings of this study have presented a new dimension in the context of educational

leadership in Malaysia. This view aligns with Lan and Hung (2018) that middle leaders need to master competency-based knowledge and skills, including professional competencies.

The study's findings also prove that professional leadership competencies are significant to the middle leaders of educational institutions. This view aligns with Tay et al. (2019), who explained that middle leaders need to underpin high accountability in management in educational institutions. The role of middle leaders as a liaison between top management and officers under their control and professional leadership competencies are very important in gaining the trust of all parties and facilitating the execution of tasks. The ability of middle leaders to practice professional competencies in educational institutions can help them become effective leaders (Cecelia & Sabariah, 2019; Grootenboer, 2018; Roselena & Mohd Izham, 2015). Empowering professional leadership competencies can also increase the effectiveness of human resource management while creating a conducive work environment.

The main implication of the findings of this study is that they can give middle leaders in educational institutions an idea of the importance of mastering all the elements of professional leadership competencies that have been validated. Including the elements presented is the most important asset in distinguishing high or medium-quality middle leaders. Boyatzis (1982) explained that competency practices enable

an individual to be more efficient and productive in employment compared to less competent individuals.

As a contribution to the development of existing theory, this study has presented four new elements of professional competence confirmed by experts: data-based decision-making, report writing, new knowledge skills, and the ability to lead. These elements are compatible with the task requirements of middle leaders today and can help these middle leaders run the organization in the future. Middle leader competencies include four new elements that can catalyze high-performing middle leaders. As an implication for practice, middle leaders can use the 13 confirmed elements as a guide for an excellent service culture in educational institutions. Middle leaders must be able to lead and be led by other staff. Mastering this professional competence is crucial because middle leaders face diverse and complex tasks. Therefore, this professional competency-based practice can equip middle leaders to meet Malaysian Teacher Standards 2.0 set by MOE.

In addition, human resource practitioners can also use these elements of certified professional leadership competencies as the basis of training and development activities for newly appointed middle leaders. The capacity development of middle leaders based on leadership competencies is very much needed, especially in education (Effendy, 2015). Training and development programs such as workshops, courses, coaching mentoring, and self-assessment can be implemented by middle leaders in a focused manner using the elements of the model developed.

CONCLUSION

In conclusion, this study was conducted in line with the DDR approach, which is to use experts in the development process of the main model of the study. In the development phase of this model, the FDM method was used to obtain expert agreement on the constructs and elements of middle leader leadership competencies. This study has shown that the constructs and elements of professional leadership competencies proposed for middle leaders have gained expert consensus. All elements were accepted after being tested and passing all three FDM prerequisites.

Besides that, this study also highlights FDM as one of the suitable techniques for developing competency models. The target groups can also utilize the validated elements relevant to Malaysia's educational leadership context. The constructs and elements obtained in this development phase were next tested in the usability phase, the final phase of the DDR-based study. Usability testing has been performed on middle leaders as users of this developed competency model and analyzed using Structured Equation Modelling (SEM) to obtain a goodness-of-fit index.

Overall, the construct of professional leadership competencies has gained consensus from educational leadership experts from various institutions and is suitable for the Malaysian context. Therefore, further studies can be conducted

using this construct involving middle-level leaders in other educational institutions, including Teacher Education Institutes, Aminudin Baki Institute, and district education offices. Further research can also be conducted by testing the model's fitness using Structural Equation Modelling (SEM) analysis to examine the applicability of this construct to mid-level leaders in the field.

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Electoral System Reform in Malaysia: A Delayed Success?

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ABSTRACT

The Election Commission (EC), Malaysia's electoral body, is frequently chastised by the public for its lack of neutrality, manipulation of the electoral roll, gerrymandering practices in constituency delineation, and unfair media access to contesting parties. As a result of these weaknesses, the Pakatan Harapan (PH) manifesto for the 14th General Election (GE-14) promised to reform the country's electoral system if they won the election. The PH Manifesto won 121 of the 222 contested parliamentary seats, capturing the people's hearts. Hence, this article examined the electoral system reforms enacted by the PH administration from its election victory in May 2018 until the end of its term in February 2020. The article asserts that PH had successfully instituted four major reforms in the country's electoral system, including placing the EC under the parliament, cleaning up the electoral roll, enhancing electoral transparency, and amending the federal constitution to allow *Undi18* (Vote18) and automatic voter registration, despite its brief tenure in power. However, the electoral system reforms stalled following the collapse of the PH government due to the Perikatan Nasional (PN) government's lack of commitment to continue this reform.

Keywords: Electoral system, Malaysia, Pakatan Harapan, reform, the Election Commission

INTRODUCTION

Electoral freedom is a frequent topic of discussion in democratic nations. Consequently, allegations of electoral system manipulation marred the elections, resulting in unfair and unjust elections. In Tanzania, election commissions are frequently accused of not being independent in their election management because the National Electoral Commission (NEC)

committee members are appointed by the President of Tanzania, who is also the president of the ruling party, rather than by an independent body (Makulilo, 2009). Mabere Nyahucho Marando and Edwin Mtei, leaders of the opposition party, filed a judicial review in 1993, questioning the legitimacy of the president's appointment of NEC committee members on the grounds that these appointments violated freedom in the conduct of elections. The court, however, rejected the judicial review because, while the president appointed committee members, this did not imply that the NEC was not independent because the commission's independence was based on the credibility of the appointed commission committee members, not their appointments by the president. Due to the lack of electoral independence, Tanzania has been ruled solely by the Chama Cha Mapinduzi party since 1980 (Morse, 2014).

In Malaysia, too, the election was allegedly unfair due to the perception that the electoral body was biased towards the government because this institution is placed under the Prime Minister's Department (PMD), demonstrating the existence of executive control over the Election Commission of Malaysia (EC) (Funston, 2018). Pakatan Harapan (PH) promised in its GE-14 manifesto that it would reform the electoral system if elected as the federal government. The promise persuaded voters to elect the coalition in GE-14. Therefore, this article focuses on electoral system reform during the PH administration. While electoral system reform was successfully implemented during the PH administration, its success has been delayed.

Electoral System Reforms in Malaysia

Numerous Malaysian scholars have published works on electoral system reforms. Weiss (2009), for instance, discussed the electoral system's reform during Abdullah Badawi's reign. He noted that the Coalition for Clean and Fair Elections (BERSIH), which staged massive demonstrations in late 2007, resulted in the Abdullah Badawi-led government implementing several electoral system reforms, including the elimination of serial numbers on ballot papers, the introduction of transparent ballot boxes, and the use of permanent ink in the election. However, permanent ink was cancelled for the GE-12 because the EC was concerned that parties would manipulate the voting process by smearing ink on voters' fingers before casting ballots. The decision drew criticism from Malaysians for Free and Fair Elections (MAFREL), who withdrew as election observers to protest the EC's action. In addition, opposition parties criticised Abdullah Badawi's decision to phase out the use of indelible ink as a failure to follow through on promised electoral system reforms.

Brown (2013) looked at the electoral system reform during the reign of Najib Razak. As the prime minister, Najib Razak established the Parliamentary Select Committee on Electoral Reform in 2011, consisting of five BN Members of Parliament (MPs), three opposition MPs,

and one independent MP. A year after its formation, the committee presented its report to parliament, covering automatic voter registration, more flexible voting locations, and simplified voting mechanisms for Malaysians living abroad. According to Brown (2013), the committee's recommendations were not implemented because Najib Razak lacked the political will to implement those recommendations. After all, Najib was concerned that the electoral reform would undermine his ruling power and allow opposition parties to gain influence. Brown emphasised at the end of his analysis that the failure to reform Malaysia's electoral system was due to the government's lack of political will because of fear of power challenges.

Dettman (2020), Ostwald (2020), and Oliver (2020) elaborated on the electoral reform during the PH era and Dr. Mahathir's second term. They pointed out that one of the significant electoral system reforms implemented by the PH government was lowering the voting age from 21 to 18 years old. The objective is to grant 18-year-old citizens the same voting rights as in most other democracies. To ensure that the EC is free of executive control and can carry out its duties independently and impartially, the PH government moved the EC from the PMD to parliament.

Although the studies mentioned above are intriguing, most do not evaluate the success of previous electoral system reforms. Therefore, this article addresses the gap by evaluating the success of electoral system reforms under the PH administration. The main argument of this article is that the implementation of electoral system reforms has been hampered by constraints addressed in the following discussion.

RESEARCH METHODOLOGY

The research method used in this article was a qualitative one. As qualitative research involves an interpretive process, it allowed the researchers to dig deeper into the electoral system reforms implemented in Malaysia to answer the research questions. Hence, this article relied on primary data gathered through interviews with informants, including Wan Junaidi Tuanku Jaafar, Minister in the Prime Minister's Department (Parliament and Law), Malaysian Opposition Leader Anwar Ibrahim, Parti Amanah Negara (AMANAH) President Mohamad Sabu, and Democratic Action Party (DAP) Secretary-General Anthony Loke Siew Fook. All these informants were involved in the electoral system reform implementation process, either as cabinet members or as members of parliamentary committees. They were able to provide information and data relevant to this article, making their information significant. Books, journals, theses, newspapers, and electronic media portals were used to obtain secondary data. These data were descriptively analysed to assess the success of electoral system reforms implemented during the PH administration. Thus, this article employed the concept of the electoral system as an analysis tool and the reform of the electoral system as its unit of analysis.

FINDINGS AND DISCUSSION

Malaysia is one of the Southeast Asian nations with the least trustworthy elections. Table 1 shows that Malaysia is ranked eighth out of ten ASEAN countries in terms of average electoral integrity from 2012 to 2018. The data is divided into eight categories: election law implementation, election implementation procedures, constituency boundaries, voter registration, political party registration, media coverage, campaign financing by political parties and candidates, voting procedure, and vote counting procedure.

According to the Electoral Integrity Project, the practice of gerrymandering and malapportionment through constituency demarcation are the primary reasons Malaysia is classified as one of the worst countries (Norris & Gromping, 2019). The disparity between the number of elected representatives and the number of voters in a constituency is referred to

Table 1
Average score index of the ASEAN Countries Electoral Integrity Index 2012–2018

No.	ASEAN Countries	Average Score
1	Timor-Leste	64
2	Indonesia	57
3	Myanmar	54
4	Singapore	53
5	Philippines	51
6	Thailand	51
7	Laos	48
8	Malaysia	35
9	Vietnam	34
10	Cambodia	30

Source: Norris and Gromping (2019, p. 6)
Note. 100-Best, 0-Poor

as malapportionment. Gerrymandering redraws electoral districts to favour the government (Ostwald, 2020). For example, in 2018, the Putrajaya parliamentary seat had approximately 27,306 voters, while the Damansara parliamentary seat had 164,322 voters, demonstrating that redistricting electoral districts is a form of injustice intended to benefit the ruling party.

Thus, electoral system reform in a country is required to enable the execution of free and fair elections. For example, during Soeharto's reign in Indonesia, elections were not held openly and equitably because the General Election Institute (LPU), the election management body, comprised ministers under his administration. It led to the country having executive control over elections, with the GOLKAR party, represented by Soeharto, constantly winning elections from 1977 to 1997 (King, 2000). However, following the downfall of President Soeharto in 1998, an electoral institutional reform was adopted, resulting in more free and fair elections in Indonesia. It is proven by establishing an independent agency called the General Election Commission (KPU), which aims to oversee free and fair elections. As a result of this measure, Indonesia has one of the highest levels of free and fair elections among ASEAN countries.

Therefore, in Malaysia, PH in GE-14 pledged to reform the electoral system if they won, and they kept their promise after achieving the victory. Hence, this article discussed four major reforms implemented by the PH government during its 22-month

tenure in office: placing the EC under parliament, cleaning up the electoral roll, improving the electoral process, and implementing *Undi18* (Vote18).

The Placement of EC Under the Parliament

The Election Commission oversees managing the electoral process in Malaysia. However, the agency is frequently criticised for failing to manage the electoral process impartially and fairly because the EC is housed within the Prime Minister's Department, which has led to allegations of executive interference and the perception that the agency favours the government in elections (Pepinsky, 2007). After claiming control of the federal government, the PH government restructured the agencies under the PMD to reduce the prime minister's concentration of power (Hashim, 2019; Nashril-Abaidah & Yusoff, 2021). The EC was one of the agencies involved in the restructuring process, and it was then placed under the jurisdiction of the parliament (Ostwald & Oliver, 2020). By placing the EC under the control of the parliament, this agency will be directly accountable to the parliament and will no longer be under the control of the executive branch. To ensure the smooth transition of the EC to the parliament, the PH government established a Special Select Committee on Electoral Reform on October 17, 2019, chaired by Dewan Rakyat Speaker, Mohamad Ariff Md Yusof ("Dewan Rakyat tubuhkan 4 lagi jawatankuasa pilihan khas," 2019). The committee's objective is to improve and refine the EC's policy to become more

effective prior to placing the agency under parliamentary control. In an interview with AMANAH President M. Sabu (personal communication, September 26, 2021), he commented:

> *"When we incorporate the EC into parliament, all members of parliament will be able to track its progress. Second, the EC is no longer under the control of the government, as it was previously under PMD. The EC is perceived to be biased in favour of the governing government under PMD. Third, the EC has the autonomy and independence required to hold free and fair elections."*

The move to place the EC under parliament is not novel, as countries with free and fair elections, such as Canada and New Zealand, are already doing so. According to Pal (2016), as well as Lawlor and Mayrand (2020), who studied the EC's journey in these two countries, placing the EC under the parliament can increase the institution's credibility as independent and neutral. It can boost public trust in the EC's transparency and integrity as the agency oversees conducting free and fair elections.

However, in Malaysia, efforts to place the Election Commission under the control of the parliament stalled after the PH government was deposed via the Sheraton Move in late February 2020. The Perikatan Nasional (PN) government, which took over from the PH, acted to abolish the Special Select Committee on Electoral Reform,

resulting in the process of placing the EC under the parliament being halted and the EC remaining under the PMD. This matter was raised by Khoo Poay Tiong, who is a member of the Parliament for the City of Melaka, on September 21, 2021, in a special chamber session demanding an explanation on the abolition of this committee when the EC returned under the PMD (Parlimen Malaysia, 2021). However, the answer given by the Deputy Minister of the Prime Minister's Department (Parliament and Law), Mas Ermieyati Samsudin, at that time was that the establishment of the EC was under the executive mandate and that the PMD was responsible for the administration and general management of the EC only. He added that although the EC is under the PMD, it remains an independent body to ensure that elections in Malaysia are conducted freely and fairly.

Despite the guarantee given by the government for the EC to remain an independent body under the PMD, there is a tendency for the executive to control the institution as it did during the previous Barisan Nasional (BN) rule. In fact, by placing the EC under the PMD, the institution is responsible for reporting to the minister in charge of the prime minister, the chief executive in the government. It indirectly illustrates that the EC is still subject to executive control even though the government guarantees only in aspects of administrative and management affairs. Because of that, the EC must be under the supervision of the parliament to ensure that this institution remains independent.

The Clean-up of Electoral Roll

The electoral roll is not clean when a deceased voter still has a record on it or when an address has multiple registered voters. Malaysian opposition leaders and civil movements like BERSIH and MAFREL frequently question the EC's transparency in ensuring the voter register's integrity. MAFREL discovered that locals did not identify 50% and 73% of the electoral rolls in its 2004 survey of the Gombak and Lembah Pantai parliaments, respectively. Even the addresses listed on the electoral rolls were unknown to locals (Wong et al., 2010). MAFREL concluded that the existence of "phantom voters" had granted BN a decisive victory in GE-11. It resulted in the Islamic Party of Malaysia (PAS) and the People's Justice Party (KEADILAN) filing an election fraud and ghost voter complaint with the Human Rights Commission (SUHAKAM) (Khalid, 2007). Aside from that, both parties demanded that the EC not release the election results until the investigation into electoral roll irregularities was completed. However, the EC continued to publish the election results, and the opposition parties filed 40 election petitions nationwide to challenge the results (Moten & Mokhtar, 2006).

In addition to MAFREL, the Parliamentary Select Committee on Electoral Reform, it was revealed in 2012 that up to 200,000 suspicious voters were on the electoral roll that year, with more than 100 voters living at the same address (Case, 2013). Due to the existence of this tainted electoral roll, BERSIH held its first demonstration in November 2007 to

demand free and fair elections. BERSIH 2 through BERSIH 5 were held between 2011 and 2016 in response to the EC's refusal to clean up the electoral roll (Johns & Cheong, 2019). Its primary demands were clean elections, a clean government, preserving the nation's economy, and the right to demonstrate (Chong, 2018).

The success of such protests prompted the EC to allow political parties and the public to review the electoral rolls quarterly (Weiss, 2009). This reform, however, was insufficient because the EC had not demonstrated a commitment to cleaning up the electoral roll, even though the electoral roll was made public. In an interview with him, the opposition leader, A. Ibrahim (personal communication, September 17, 2021), stated:

"Why is it so difficult for the government to meet the people's and BERSIH's demands for a free and fair election process? Our demands are simple: a clean electoral roll, postal vote reform, and media access. What exactly is the problem with this electoral roll? The electoral roll is not being updated, so deceased voter data remains; there are 'ghost voters,' or voters who use other people's identity cards to vote; and the list of names in the electoral roll suddenly disappears on polling day. While we understand that implementing these things takes time, it is highly unreasonable to take too long to do so."

The EC's failure to resolve these issues demonstrates that the country's electoral system is not being implemented independently and fairly. As a result, when the PH was in power, the task force committee was formed, which involved the EC and the National Registration Department (NRD) to coordinate the investigation of issues concerning the verification of citizen information to clean the electoral roll ("SPR, JPN tubuh pasukan petugas khas," 2019). The EC has worked with the NRD through this committee to ensure that the electoral roll is free of voters who are not eligible to vote. Cooperation with the NRD is critical because the agency has data on every Malaysian citizen, and the coordination of citizen information is required to release the names of deceased voters.

The Electoral Reform Select Committee was established at the parliament level in October 2019 (Carvalho et al., 2019). This cross-party committee was formed to provide suggestions and recommendations to the EC to increase transparency in Malaysia's election process. This committee's primary function is to make recommendations on the issue of electoral roll cleaning. From its inception until the end of February 2020, this committee had actively requested that the EC provide a report on the reform of election implementation as well as the cleaning of the electoral roll.

These steps to clean up the electoral roll showed a positive effect until 2020. According to Kota Melaka Member of Parliament Khoo Poay Tiong, who is

also a member of the Electoral Reform Select Committee, the committee's recommendation for electoral roll cleaning resulted in the EC removing 348,098 individuals who were discovered dead between 2018 and 2020 ("Apa nasib usaha reformasi proses pilihan raya," 2020). It demonstrates that during the PH era, the EC began implementing electoral system reforms by cleaning the electoral roll.

However, after the fall of the PH government and the change of EC leadership, the process of cleaning the electoral roll slowed again during the PN and BN eras. It can be seen when there were allegations about unresolved voter registration issues. For example, Fuziah Salleh, a Kuantan MP, claimed that after researching the list of new voters registered by the EC between September 30 and December 31, 2021, the names of deceased voters remained on the electoral roll. As a result of the allegations, BERSIH urged the government to establish an independent electoral roll audit committee to review and audit the electoral roll ("BERSIH gesa kerajaan tubuhkan jawatankuasa audit," 2022). However, the government and the EC did not accept this proposal until the 15th General Election (GE-15). The government's and the EC's failure to take this issue seriously causes doubts about the voter register in Malaysia.

The Enhancement of Electoral Transparency

Electoral transparency in Malaysia is frequently contested. According to Welsh (2015), Weiss (2016), and Ostwald (2020), this lack of transparency occurs in five instances. The first example is scepticism concerning postal votes because the EC does not provide postal voter lists to agents of opposition party candidates, and they are not permitted to enter polling stations to monitor voting procedures. As a result, the postal vote works as a lifeline to victory in the GE and benefits the BN government. In GE-10, for example, Shahrizat Abdul Jalil, the BN candidate for the Lembah Pantai seat, lost in the regular voting process but won with a majority of 1417 votes after postal votes were counted (Weiss, 2000). Besides that, the Merdeka Centre study in GE-13 discovered that postal votes helped BN win in 22 parliaments nationwide, with the party receiving 89.5% of the votes (Ufen, 2013). It raises the issue of transparency in its implementation, as representatives of opposition parties are not permitted to monitor the postal vote's implementation.

Second, there are allegations of election fraud that favour BN. In GE-13, for example, the electricity supply was cut off during the vote-counting process (Welsh, 2013). Following the GE-13, opposition parties and civil society held a 'Blackout 505' rally, with thousands of participants flooding the Kelana Jaya Stadium (Mohd Zulkifli, 2021). Another fraud allegation is using permanent ink in GE-13, which allegedly faded when washed. Although the EC stated that the ink would remain to prevent the existence of repeat voters, the reality was that the ink used in the election did not remain as claimed (Ufen, 2013). It demonstrates that

Malaysia's electoral process is opaque due to the possibility of manipulation and fraud.

Thirdly, there are money politics and corruption. For example, following money politics, the court annulled the victory of the BN candidate in Bukit Begunan DUN, Sarawak, namely Mong Ak Dagang, in the Sarawak State Election 1996. An independent candidate, Donald Lawan, filed an election petition to overturn Dagang's victory over allegations of bribing voters to gain support. The court then overturned the state assembly election results (Chin, 1998).

The fourth issue is the redelineation of electoral constituencies as a result of the use of gerrymandering and malapportionment in the redelineation process. Gerrymandering is the practice of manipulating constituency boundaries to benefit the government. In Selangor, for example, prior to the redelineation of electoral constituencies in 2018, 16 constituencies in the state had mixed voters (50% to 60% Malay voters or 50% to 60% Chinese voters). However, after the demarcation, the area was changed to 13 Malay-majority seats (over 60% of Malay voters) and three Chinese-majority seats (over 60% of Chinese voters) (Wong, 2018). This action gave BN an advantage because the party enjoyed strong support in Malay-majority areas compared to mixed areas.

Malapportionment occurs when one constituency's voter ratio differs significantly from that of another. In GE-13, for example, the Putrajaya parliament had only 15,791 voters, whereas another parliamentary constituency in the Klang Valley, Kapar, had nearly ten times the number of voters as Putrajaya, with 144,159 voters (Ostwald, 2013). It violates Section 2(c) of the Thirteenth Schedule of the Federal Constitution, which states that the number of voters in each constituency in a state must be roughly equal to each other, "The number of electors within each constituency in a State ought to be approximately equal except that, having regard to the greater difficulty of reaching electors in the country districts and the other disadvantages facing rural constituencies, a measure of weightage for area ought to be given to such constituencies."

Although gerrymandering and malapportionment are against the constitution's intent, the EC continues to use them because they benefit the BN government. It is why the EC is viewed as not being transparent, independent, or fair in its election administration. In GE-13, for example, BN lost the popular vote by 4% but still managed to form a government with a 20% majority in the parliament (Ostwald, 2020). BN received 47.4% of the popular vote nationwide but won 59.9% of the parliamentary seats. Pakatan Rakyat (PR), which at the time consisted of DAP, PKR, and PAS, won 50.9% of the popular vote but only 40.1% of parliamentary seats (Chin, 2013). It illustrates that the practice of gerrymandering and malapportionment had resulted in BN's victory, even though they did not generally receive the support of most voters. Therefore, gerrymandering and malapportionment are vehemently opposed by civil society organisations such as BERSIH, which see this practice as one

of the country's electoral system's injustices (Fadzil & Samsu, 2015).

These four issues exemplify Malaysia's lack of transparency in elections. It has resulted in manipulating the GE implementations, which benefits the ruling party. Ergo, after PH won the GE-14, the EC implemented several electoral system reforms to increase the transparency of Malaysia's electoral process. The EC has collaborated with the Royal Malaysian Police (PDRM) and the Malaysian Anti-Corruption Commission (MACC) to combat money politics by candidates and political parties. For example, during the Sabah State Election on September 21, 2020, the MACC arrested two security forces members carrying money suspected of buying votes for a political party (Hassan, 2020).

Furthermore, the EC has increased postal vote transparency by declaring the number of postal votes cast on nomination day. According to EC Chairman Azhar Azizan Harun, this declaration was made to avoid allegations of postal vote manipulation to benefit specific candidates or parties (Alias & Parzi, 2019). For example, in the Tanjung Piai by-election, the EC declared 227 postal voters eligible to vote. Another example is that the EC announced that 17,885 postal ballot papers were issued in the Sarawak State Election at the end of 2021. The postal ballot papers were distributed in the presence of candidate representatives from all parties or individuals contesting in the election (Ibrahim, 2021).

Hence, the EC will broadcast the vote-counting process live to ensure no election

fraud. It began with the Sungai Kandis by-election following GE-14 (Azman, 2018). The goal is to ensure transparency in the vote-counting process and to demonstrate that it is carried out transparently without any manipulation to favour certain candidates. With these changes, there are fewer disagreements in the country about the transparency of the electoral process.

However, another unimplemented electoral system reform is the elimination of gerrymandering and malapportionment because a constitutional amendment is required to provide a clearer clause on a more equitable re-demarcation ratio to be used as a guide by the EC. In response, DAP Secretary-General A. L. S. Fook (personal communication, February 10, 2022) stated:

> *"To ensure that gerrymandering and malapportionment do not occur again, the constitution, particularly the Thirteenth Schedule, must be amended. However, during that time, we needed a two-thirds majority in order to amend the constitution, which the PH did not have at the time. If we wanted to do it, we needed the opposition's help. However, the opposition did not agree because it did not give them an advantage."*

Following the fall of the PH government, the PN and BN governments lacked the political will to prevent gerrymandering and malapportionment from occurring again. They cited the lack of a two-thirds majority as a barrier to enacting constitutional

amendments, particularly those involving the Thirteenth Schedule. W. J. T. Jaafar (personal communication, January 6, 2022), Minister in the Prime Minister's Department (Parliament and Law), stated in an interview with him:

> *"If the opposition believes that the constitution should be amended to address the issue of gerrymandering and malapportionment, they can introduce a private bill in parliament. They should keep in mind that amending the constitution requires a two-thirds majority, which I doubt they will be able to achieve. In fact, the government does not intervene in gerrymandering, malapportionment, as well as redelineation deal. That is a recommendation from the EC, not the government. Hence, we follow that advice."*

It is not impossible if the government has a strong political will to reform the electoral system to prevent gerrymandering and malapportionment from occurring again. However, the implementation process of the reform is being acknowledged to take a long time because the government needs the opposition party to support it. The government and the opposition must discuss and negotiate to ensure both parties accept the proposal. However, until now, there has been no discussion between the two parties about this reform, which indicates that gerrymandering and malapportionment are to be continued in the future.

The Execution of Undi18 and Automatic Voter Registration

In accordance with their manifesto in the GE-14 campaign, the PH government also reduced the voting age from 21 to 18 years old and implemented automatic voter registration. It is consistent with the practice of most countries around the world, which have reduced the voting age to 18 years since the 1960s (Mycock et al., 2020). It is also coherent with Article 1 of the United Nations (UN) Convention on the Rights of the Child, which defines a "child" as anyone under the age of 18 (United Nations International Children's Emergency Fund, 2007). So, according to this definition, anyone over 18 is considered an adult. In Malaysia, the Adult Age Act 1971 established the age of 18 as the legal age of adulthood for Malaysians (Malaysia, 2006).

Furthermore, the PH government is confident that young people aged 18 and above have adequate political awareness to vote in elections. As a result, on July 16, 2019, the government proposed an amendment to the Federal Constitution to reduce the voting age from 21 to 18 years. The motion was passed with a two-thirds majority after 211 MPs voted in favour (Mat Ali & Yusoff, 2022).

Although many countries have reduced the voting age, prior to the amendment to the Federal Constitution, only Malaysia and Singapore, among the ASEAN countries, kept the voting age at 21 or older. This age limit is also similar to that of countries still lagging in democracies, such as Kuwait, Oman, Cameroon, Lebanon, Samoa, and

Tonga (Dundas, 2014). The situation is different in almost all Asian countries that have reduced the voting age to 18 years, and some European countries, such as Austria, Norway, Scotland, and Germany, which have begun to reduce the voting age from 18 to 16 years (Maheo & Belanger, 2020).

In addition to lowering the voting age to 18, the PH government has amended the constitution to allow automatic voter registration. Automatic voter registration was implemented to make it easier for citizens to register and to increase voter turnout. Before the amendment was implemented, the national electoral system was prohibited by Article 119 Clause (4) of Paragraph (b) from implementing automatic voter registration that states—"qualifying date" means the date on which a person applies for registration as an elector in a constituency or the date on which he applies for the change of his registration as an elector in a different constituency in accordance with the provisions of any law relating to elections. It means that if a person wishes to vote, they must submit an application to be registered with the EC before casting ballots.

Following the fall of the PH government, the PN governments lacked the political will to carry out *Undi18* and automatic registration. *Undi18* and automatic voter registration were supposed to go live in July 2021 but were pushed back to September 1, 2022. The reason was due to the COVID-19 pandemic and the implementation of the Movement Control Order (MCO). On March 25, 2021, EC Chairman Abdul Ghani Salleh stated that automatic voter registration and *Undi18* could only be implemented after September 1, 2022 (Rahim, 2021). However, opposition parties and civil society objected to the EC's explanation. They emphasised that the delay should not have occurred because the agreed-upon amendment to the Federal Constitution had been done and that the delay in implementing it demonstrated disrespect for the consented amendment to the Federal Constitution.

Although PN and BN MPs supported the constitutional amendment in 2019 to ensure the implementation of *Undi18* and automatic registration, they were seen as deliberately delaying its implementation while in government. The main reason for this delay is that they were not convinced that *Undi18* and automatic registration would benefit them once they took office. As a result, when they became government, they lacked the political will to expedite the implementation of *Undi18* and automatic registration. A. L. S. Fook (personal communication, February 10, 2022), Secretary General of the DAP, stated:

> *"When the PN and BN MPs became the opposition, they supported Undi18 to demonstrate that they, too, recognise the rights of Malaysia's youth. However, once in power, they were hesitant to implement Undi18 because they were unsure that young people would vote for them. This is why the PN and BN are viewed as untrustworthy and are delaying*

the implementation of Undi18. The same is true for automatic registration. They previously supported it, but their government is now unsure whether it will benefit them."

As a result of the EC's action, 18 people filed a judicial review on April 2, 2021, to challenge the government's decision to postpone the implementation of *Undi18* (Abas, 2021). On May 3, 2021, five Sarawak youths petitioned the Kuching High Court for a judicial review, urging the federal government to immediately implement *Undi18* under Section 3 (Constitution (Amendment) Act 2019) (Abdul Rashid, 2021). They regarded postponing the implementation of *Undi18* as denying more than 125,000 young people in Sarawak the right to vote in state elections. The Kuching High Court granted the application on September 3, 2021, and ordered the federal government to exercise *Undi18* by December 31, 2021 ("Mahkamah arah SPR laksana Undi 18", 2021). The government then directed the EC to implement *Undi18* by December 31, 2021, to comply with the Kuching High Court's decision. However, *Undi18* was implemented earlier, beginning on December 15, 2021, after the Attorney General's Department issued the federal government gazette on December 1, 2021 (Ali, 2021).

CONCLUSION

This article discusses the electoral system reforms implemented by the PH government during its 22-month tenure. There were four electoral system reforms: placing the EC under parliament, cleaning up the electoral roll, increasing electoral transparency, and amending the federal constitution to implement Undi18 and automatic voter registration in elections. Even though the reforms were implemented, there were constraints in implementing them. These constraints stemmed from three factors: the new government's lack of commitment, constitutional obstacles, as well as the PN and BN governments' distrust of the new system.

Regarding the new government's lack of commitment, the PN government and others do not see the need to continue with the PH government's electoral system reform. They never promised to reform the electoral system in their election manifestos. Second, the PH is restricted by constitutional constraints, particularly the practice of gerrymandering and malapportionment at every electoral demarcation due to the PH not having a two-thirds majority at the time to amend the federal constitution to include a clear clause on the electoral boundaries when the redelineation of electoral constituencies is implemented. Finally, the PN and BN governments are sceptical of the new system, which they perceive as threatening their power hegemony. It is feared that these reforms will allow opposition parties to increase their influence. Thus, these three obstacles have hindered and delayed the success of the electoral system reforms that the PH government initiated.

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Determinants of Psychological Problems Among Widows Living Under the Long Civil Unrest in the Southernmost Provinces of Thailand

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ABSTRACT

People in the deep south region of Thailand have experienced civil unrest since 2004, and widows from the conflict have been severely stressed and faced various psychological problems. This study aims to investigate psychological problems and examine factors affecting the psychological problems among these widows. The psychological problems are post-traumatic stress disorder (PTSD), complicated grief (CG), and depression. The study's sample consisted of 350 widows who voluntarily participated in the interviews and completed the questionnaires. PTSD symptom scale-interview version assesses post-traumatic stress disorder, and the complicated grief is measured using the inventory of the complicated grief, and the depression is evaluated with the Hamilton rating scale for depression (Thai version). The results indicate that the respondents had a high post-traumatic stress disorder state ($M = 21$, $SD = 13.8$), a high complicated grief state ($M = 28.56$, $SD = 19.69$), but a low depression state ($M = 5.48$, $SD = 5.70$). Thirty-two percent of the samples fulfilled the criteria for post-traumatic stress disorder, 48% for complicated grief, and 26.6% for depression. The factors significantly affecting post-traumatic stress disorder, complicated grief, and depression are low resilience, high external stressors, and the quality of life. However, the results should be interpreted with caution due to the risk of biases of the sensitive nature of the study. Therefore, to better understand the risks and protective factors of post-traumatic stress disorder, complicated grief, and depression of the bereaved widows, significantly different factors should be considered.

Keywords: Civil unrest, psychological problems, widows

INTRODUCTION

Significant psychological problems result from the violent death of people's loved ones (Djelantik, Robinaugh, Kleber, et al., 2020; Grafiadeli et al., 2022; Williams et al., 2018). Post-traumatic stress disorder (PTSD), complicated grief (CG), and depression are common psychological problems that often occur among people having bereavement (Djelantik, Robinaugh, & Boelen, 2022). These psychological problems resulting from losing a spouse are among the most difficult social and psychological issues. As findings in bereaved Kosovar civilian war, survivors who had lost first-degree relatives due to war-related violence seven years ago and other war-related events had high psychological problems, with 55% PTSD, 38.3% CG, and 38.3% depression (Morina et al., 2010). Widow survivors of the Rwandese genocide had 53.2% of their lifetime PTSD, while the current PTSD was 28%, significantly associated with depression (Ngamije, 2009). Similarly, 16.5% of widows met CG with an average of 12 years post-loss, and their grief-related loss was 70% due to violent death, and this highly significant CG was also related to PTSD (Schaal et al., 2010).

In the southernmost provinces of Thailand, 20,539 unrest events occurred from January 2004 to February 2020, resulting in 13,247 injuries and 7,103 deaths. This civil unrest caused bereavement among the victims, with 3,075 women becoming bereaved widows (Treesuwan, 2020). There was a study reporting that the widows were grieving, mourning, experienced loneliness, desperation, anxiety, and frustration (Kaewkabthong, 2015), and 7.4% of bereaved people from this unrest had poor mental health (Songwathana et al., 2017). The result of a survey in 2014 by the Thai Health Promotion Foundation (ThaiHealth Official, 2017) indicated that people affected by the civil unrest situation had PTSD at 2.6% (higher than other areas, approximately five times the rate), and PTSD co-occurred with 90% of depression and 55% of suicidal idea.

Previous studies found a connection between psychological problems and socio-demographic factors. Ages, marital status, religions, education levels, residences, occupations, and incomes were found to be significantly related to psychological problems, arguably to a certain extent. Ages were inconsistently reported as a risk factor in the development of PTSD and CG (Ford et al., 2015; Kersting et al., 2011; Park et al., 2015), and other studies documented no association among ages for PTSD or CG (Britvić et al., 2015; Taha et al., 2021; Xue et al., 2015). Younger ages were significantly associated with suicidality in depression patients (Casey et al., 2015); younger people had a higher depression rate than older people (Park et al., 2015). Marital status as a widow was a strong significant predictor of PTSD (Taha et al., 2021), and having a widow status bore a significant risk factor affecting an increase in the CG score (He et al., 2014). Living with a partner or spouse significantly affected a low-risk depression score (Lorant et al., 2007), while a low-quality marital relationship was a risk factor for depression (Matinnia et al., 2018).

Belief in religions was yet unclear in terms of its significance, but there was more of a tendency of a protective factor against CG and depression (Braam & Koenig, 2019). Religions generated a unique, positive contribution to recovering from PTSD (Carroll et al., 2020). Education levels were also considered a predictor for PTSD (Ford et al., 2015; Xue et al., 2015). However, some studies argued that there was no relationship between levels of education and PTSD (Britvić et al., 2015; Taha et al., 2021). Low education levels may have been considered a risk to meet CG (He et al., 2014), while higher educational levels seemed to have a protective effect against depression (Maier et al., 2021). Residents living close to violent situations might face direct exposure, as well as those living in disaster-prone areas, where they tend to increase the risks of developing psychological problems. Living in different residential areas had also significantly affected PTSD scores (Ford et al., 2015; Taha et al., 2021). However, no difference between residence places—villages and urban/cities—affected a CG score (He et al., 2014), but living during the war was related to violence risks for CG (Morina et al., 2010).

Employment status, such as employment, unemployment, and pensioners, had significantly different PTSD (Britvić et al., 2015). People who met the criteria for CG had impairment in their occupational area (Prigerson, Horowitz, et al., 2009). In addition, employment status led to changes in the rates of depression (Lorant et al., 2007). Income was also a socioeconomic resource, considered a protective factor against PTSD because high socioeconomic status provided access to opportunities such as financial support (Ford et al., 2015). Higher monthly incomes were significantly less likely to experience CG than those with lower monthly incomes (Kersting et al., 2011). Financial strain increases the risks of depressive symptoms (Lorant et al., 2007).

The literature shows a variety of trauma event factors associated with psychological problems. The traumatic events were frequently associated with PTSD, especially intense fear, helplessness, or horror (Ngamije, 2009). It could be concluded that trauma events were positively correlated with PTSD (Park et al., 2015). In addition, traumatic events that occurred to someone close to or on a mass scale, such as war or genocide, could lead to a higher risk of PTSD (Ford et al., 2015). Regarding CG, medical and trauma events had a significant negative effect on CG symptoms (He et al., 2014), as well as violent death events with a higher CG score than non-violent events (Schaal et al., 2010). Nevertheless, there was little support for differences between suicide survivors and homicide survivors or between suicide survivors and accident survivors in terms of symptoms of depression (Hibberd et al., 2010). The elapsed time since trauma was negatively correlated with PTSD (Park et al., 2015). The CG score of widows who lost their beloved people for one year was higher than those who lost their loved ones over one year and the average years (11.5 years; Schaal et al., 2010).

Besides, the mean duration after the loss was 4–6 months of accidents; survivors were reported to experience more depression than 9–4 months after the loss. However, some studies found no significant differences in depression at 5 months, 14 months, and 6 years after the deaths (Hibberd et al., 2010). Survivors who faced more than one traumatic event tended to exhibit more risks of developing psychological problems. Survivors who had multiple losses or experienced at least one and often two or more traumatic stressors were significantly related to PTSD (Ford et al., 2015; Kessler et al., 2017). A person who had faced multiple losses tended to meet the criteria for CG (Schaal et al., 2010). Moreover, the number of losses of household family members was shown to predict emotional distress and depression (Kristensen et al., 2012).

There were previous research works examining psycho-social factors impacting psychological problems. Risk factors associated with PTSD were external stressors (Kydonieus, 2016), family problems (Ford et al., 2015), and interpersonal conflicts (Ford et al., 2015). Risk factors leading to CG were family problems and interpersonal conflicts (Melhem et al., 2004). Risk factors related to depression were family problems (Mason et al., 2020) and interpersonal conflicts (Melhem et al., 2004). Protective factors comprising resilience (Horn & Feder, 2018), self-efficacy (Ford et al., 2015; Hibberd et al., 2010), social support (Ford et al., 2015), and quality of life (Hansson, 2002) were significantly affected the reduced risks of persistent PTSD. Protective factors related to CG were resilience (King & Delgado,

2021), self-efficacy (Hibberd et al., 2010), social support (Hibberd et al., 2010; King & Delgado, 2021), and quality of life (Boelen & Prigerson, 2007). Also, protective factors associated with depression were resilience (Edward, 2005), self-efficacy (Hibberd et al., 2010), social support (Casey et al., 2015; Razzak et al., 2019), and quality of life (Hansson, 2002).

Several studies also suggested that psychological problems were associated with healing factors. Healing factors were meant to be ways of helping people to get out of suffering from loss effects. There were two ways to these healing factors: receiving compensation from the government and having problem solutions by themselves, which were investigated and found that the score of PTSD (Park et al., 2015), CG (Mason et al., 2020), and depression (Park et al., 2015) reduced after people participated in those healing activities which provided healing solutions to their problems after loss of their beloved people.

Still, there is a lack of studies on factors associated with psychological problems involving PTSD, CG, and depression, especially among widows living under long civil unrest in the southernmost provinces of Thailand. Therefore, the objective of all the factors in this study is to identify factors most closely associated with PTSD, CG, and depression. The factors were socio-demographic, trauma event, psycho-social, and healing factors. In addition, this study also examines the state of PTSD, CG, and depression among the selected widows. The findings of this study could be beneficial for understanding the real situations these

widows face and designing the healing process to improve their health.

METHODOLOGY

Participants

The cross-sectional study was conducted from September 2019 to February 2020. The samples were widows who were selected by convenience sampling. Their data were collected using a questionnaire on demographic characteristics, post-traumatic stress disorder (PSS-I), complicated grief (ICG), and depression (HRSD-17). In detail, the widows participating in this study were those who had lost their husbands in Thailand's southern insurgency situation between January 2004 and February 2020 in Pattani, Yala, and Narathiwat.

The sample size is calculated using the following formula: $n = \frac{NZ_{\alpha/2}^2}{4Ne^2 + Z_{\alpha/2}^2}$, where n is the required sample size, N is the number of population (3,075), $Z_{\alpha}/_2$ is 1.96 whereby α is 0.05, and e is the precision of estimation (0.05). Initially, the sample size was 341.49, which was expanded to 350 to compensate for the non-response of participants.

Measures

The questionnaire on the socio-demographic factors (ages, marital status, religions, educational levels, places of residence, occupations, and monthly incomes), trauma event factors (trauma event types, duration in years of loss, and loss of other beloved people), and healing factors (receiving compensation and having problem solutions) was developed.

For PTSD Symptoms, the Scale-Interview Version (PSS-I) was adopted from Foa and Tolin (2000). The 17-item semi-structured questionnaire was developed for the interview process. The interviews were applied to assess the presence and the severity of the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV; American Psychiatric Association, 2005) PTSD symptoms. The rating scales were considered to reflect a combination of frequency and severity (from 0 = "not at all" to 3 = "5 times or more per week/very much") and yield a slightly higher coefficient and sensitivity to PTSD. PSS-I score ranged from 0–51, whereby more than 15 score was considered a cut point for PTSD diagnosis, which was determined by counting the number of symptoms endorsed per symptom cluster: 1 re-experiencing, 3 avoidances, and 2 arousal symptoms or greater.

Inventory of Complicated Grief (ICG; Prigerson, Maciejewski, et al., 1995) was used to measure the symptoms of CG and comprised 19 items. This ICG rating scale contained five levels: never, rarely, sometimes, often, and always. The ICG score range was from 0–76, whereby the respondents with more than 25 of the ICG score were considered as having CG.

Hamilton Rating Scale for Depression (HRSD-17) in the Thai version (Lotrakul et al., 1996) assessed depression symptoms in four domains: depression and anxiety, sleep, physical, and cognitive domains. The scales were from 0 to 5, categorized as 0 = absent or none or no difficulty, 1 = mild, 2 = moderate, 3 = severe, and

4=incapacitating. Examples of some items were "depressed mood (sadness, hopeless, helpless, worthless)", "feeling of guilt?" and "early insomnia?" The HRSD score range was from 0–31, whereby a lower than 8 score was considered as no depression, an 8 to 13 score meant mild depression, a 14 to 18 score identified moderate depression, 19 to 22 score showed severe depression, and a score of more than 22 was labeled as very severe depression.

Regarding the psycho-social factors, the compilation of resilience was measured by the Thai resilience quotient screening test (Department of Mental Health, 2009). General efficacy was assessed by the general self-efficacy scale (Schwarzer et al., 1997). Family problems and interpersonal conflicts were indicated in the employee assistance program inventory by Anton and Reed (2004). Social support was evaluated using a part of the Thai mental health indicator (TMHI; Mongkol et al., 2004). The World Health Organization Quality of Life Brief-Thai (WHOQOL-BREF-THAI) assessed the quality of life and was developed by the Department of Mental Health (2005). All instruments were only in Thai.

Procedures

The name list of all the widows residing in districts was available from three districts in each province, and approximately 40 widows were selected. Notifications and appointments for the interviews were informed in advance. Prior to conducting the interviews, psychologists asked the participants about their preferred language (Thai or Yawi) and collected data in the mentioned language. Nine psychologists (one from each hospital) carried out the interviews at the district hospitals. Most widows are bilingual. They *speak* the "Thai" and "*Yawi*" dialects of Malayan, which should mutually be comprehensible with Bahasa Malaysia. These psychologists are bilingual Muslims who fluently speak "Thai" and "Yawi" and have experience using measurement tools. The tool of this study was the questionnaire written in Thai. All participants were provided with an information sheet explaining the study's aims, and verbal consent was received from the participants.

Data Management

Each filled questionnaire was checked for completeness, and the data were recorded. Some items in the questionnaire were incomplete with some fields, so they were left blank. These missing values were less than 5% and replaced with each variable's median value. The total scores of PTSD, CG, and depression were computed. The total scores of each variable of psycho-social factors were computed by adding the questionnaire items and treating them as categorical variables.

Statistical Methods

Statistical analysis in this research involved analyzing the frequency distributions of determinants. The determinants comprised the socio-demographic factors, the trauma event factors, the psycho-social factors, and the healing factors. The socio-demographic factors included age, marital status, religion,

levels of education, residences, occupations, and incomes. The trauma event factors contained trauma event types, duration in years of loss, and loss of other beloved ones. The psycho-social factors were resilience, general self-efficacy, external stressors, family problems, interpersonal conflicts, social support, and quality of life. Finally, the healing factors comprised received compensation and solutions to problems. Their univariate associations were measured with the outcomes of PTSD, CG, and depression scores using an independent sample t-test and one-way analysis of variance (ANOVA). Backward-selection multiple regression was also used to examine the relationship between the determinants and the psychological problem outcomes. The data analysis used R: a language and environment for statistical computing (R Core Team, 2018). This study protocol was approved by the research ethics committee for science, technology, and health science (psu.pn.1-008/62), Prince of Songkla University, Pattani Campus.

RESULTS

Characteristics of the Samples

Table 1 shows the frequency distributions of the determinants. In terms of the socio-demographic factors among 350 widows who responded to the questionnaires, 33.7% of widows were at the age of 50–59, 73.4% remained in the widow status, and 26.4% were newly married. For their religions, 81.7% of them are Muslims. Regarding their educational level, 46% had finished secondary school. In addition, 48% of the participants lived in Narathiwat. Finally, for their occupations, 77% of the samples were unemployed, and 29.4% of them had lower than 4,000 Baht of income. Pertaining to the trauma event factors, 80.9% of their husbands died due to shooting, 30.6% of the samples said that their husbands died between 11 years 1 month and 13 years ago, and 91.4% of these widows indicated that their husbands had just died. In terms of the psycho-social factors, 48% of the widows had low normal resilience, 41.8% had high general self-efficacy, 46.9% had mild external stressors, 50% had mild family problems, 44.3% had internal conflicts, 48.8% had fair social support, and 71.1% had fair quality of life. With regard to the healing factors, 77.7% of the participants had received compensation, and 32.3% had solved their problems by self-awareness, struggle, mindfulness, and tolerance.

Table 1
Characteristics of respondents (n = 350)

Factors		n	%
Socio-demo factors			
Ages (years old)	Less than 40	83	23.7
	40–49	107	30.6
	50–59	118	33.7
	60 and over	42	12.0

Table 1 *(continue)*

Factors		n	%
Marital status	Widow	257	73.4
	Newly married	93	26.6
Religions	Buddhist	64	18.3
	Islam	286	81.7
Levels of education	Uneducated	16	4.6
	Primary	140	40.0
	Secondary	161	46.0
	Bachelor & higher degree	33	9.4
Residences	Pattani	46	13.1
	Yala	135	38.6
	Narathiwat	169	48.3
Occupations	Unemployed	80	22.9
	Employed	270	77.1
Incomes (Baht)	< 4,000	103	29.4
	4,000–4,500	76	21.7
	4,501–6,000	91	26.0
	> 6,000	80	22.9
Trauma event factors			
Trauma event types	Killed by shooting	283	80.9
	Killed by bomb	19	5.4
	Others	48	13.7
Duration of loss (years)	<8	82	23.4
	8–10	81	23.1
	11–13	107	30.6
	>13	80	22.9
Loss of other beloved people	No	320	91.4
	Yes	30	8.6
Psycho-social factors			
Resilience	Low normal	103	29.4
	Normal	216	61.7
	High normal	31	8.9
Self-efficacy	Low	109	31.1
	Moderate	95	27.1
	High	146	41.8
External stressors	Mild	164	46.9
	Moderate	26	7.4
	High	44	12.6
	Severe	116	33.1

Table 1 *(continue)*

Factors		n	%
Family problems	Mild	175	50.0
	Moderate	32	9.1
	High	36	10.2
	Severe	107	30.6
Interpersonal conflicts	Mild	155	44.3
	Moderate	41	11.7
	High	41	11.7
	Severe	113	32.3
Social support	Low	82	23.4
	Fair	202	57.7
	Good	66	18.9
Quality of life	Not good	16	4.6
	Fair	249	71.1
	Good	85	24.3
Healing factors			
Received compensation	In process	78	22.3
	Yes	272	77.7
Solutions to the problems	No way/still suffering	84	24.0
	Religious principle	28	8.0
	Understanding life	17	4.8
	Family/relatives/friends	108	30.9
	Self-awareness/struggle / mindfulness/tolerance	113	32.3

State of PTSD, CG, and Depression

The mean value of PTSD was 21.06, and its standard deviation was 13.87. The lowest score of PTSD was 0, while the highest score was 51. The mean value of CG was 28.56, and its standard deviation was 19.69. The lowest score of CG was 0, while the highest score was 76. The mean value of the depression was 5.48, and the standard deviation was 5.70. The lowest score of the depression was 0, while the highest depressive score was 31.

In addition, the state of PTSD, CG, and depression were explored in terms of prevalence and presented in Figure 1. The PTSD symptoms based on the PSS-I score were summarized, and 32% of the widows met the full criteria for the PTSD diagnosis. According to the ICG screening, 48% of them had met the criteria for CG. In terms of the depression state based on the HRSD score, 26.6% of those who met depression were indicated separately into 16.6% of mild depression, 4.6% of moderate depression, 3.4% of severe depression, and 2% of very severe depression. Of the widows who met all the PTSD, CG, and depression criteria, 8%, 22% met both PTSD and CG, 6.6%

had both CG and depression, and only 2% of them faced PTSD and depression. Importantly, no widow possessed only PTSD. However, those widows without psychological problems with PTSD, CG, and depression were 40%.

The results of the univariate analysis with mean (*M*) and *p*-value from *t*-test or ANOVA are presented in Table 2. The *p*-values for significant predictors at $p < 0.05$ are highlighted in bold.
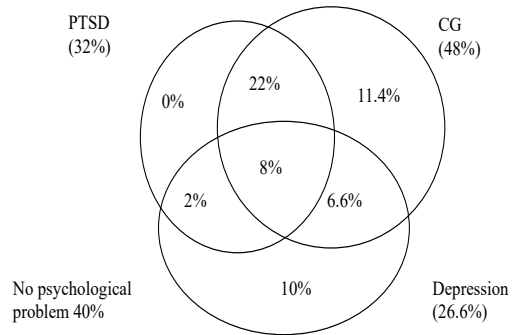
Figure 1. Percentage of psychological problems among widows

Table 2

Characteristics of bereaved widows in relation to PTSD, CG, and depression (n = 350)

Factors		PTSD		CG		Depression	
		M	*p*-value	M	*p*-value	*M*	*p*-value
Socio-demo factors							
Ages (years old)	Less than 40	22.42	**<0.001**	31.82	**0.017**	6.98	**0.043**
	40–49	23.31		30.20		5.26	
	50–59	20.85		27.61		4.71	
	60 and over	13.29		20.67		5.26	
Marital status	Widow	21.71	0.147	29.65	0.086	5.27	0.251
	Newly married	19.28		25.56		6.06	
Religions	Buddhist	19.31	0.264	28.30	0.904	3.17	**<0.001**
	Islam	21.46		28.63		6.00	
Levels of education	Uneducated	17.37	0.125	23.94	**0.047**	5.56	0.210
	Primary	19.39		25.81		6.05	
	Secondary	22.80		31.71		5.34	
	Bachelor & higher degree	21.51		27.18		3.76	
Residences	Pattani	20.30	**<0.001**	29.89	**<0.001**	6.78	0.080
	Yala	29.53		40.31		4.73	
	Narathiwat	14.51		18.82		5.73	
Occupations	Unemployed	19.55	0.267	26.55	0.298	7.10	**0.003**
	Employed	21.51		29.16		5.00	
Incomes	< 4,000	15.46	**<0.001**	20.88	**<0.001**	5.70	0.871
	4,000–4,500	16.63		21.03		5.07	
	4,501–6,000	26.87		37.53		5.69	
	> 6,000	25.90		35.42		5.36	

Table 2 *(continue)*

Factors		PTSD		CG		Depression	
		M	*p*-value	M	*p*-value	*M*	*p*-value
Trauma event factors							
Trauma event types	Killed by shooting	21.83	**0.045**	30.09	**0.011**	5.12	**<0.001**
	Killed by bomb	14.37		22.63		3.10	
	Others	19.21		21.94		8.58	
Duration of loss (years)	<8	20.72	**<0.001**	29.17	**<0.001**	6.52	0.110
	8–10	20.73		26.65		5.97	
	11–13	26.27		35.83		4.71	
	>13	14.80		20.16		4.95	
Loss of other beloved people	No	21.17	0.661	28.82	0.439	5.08	**<0.001**
	Yes	20.00		25.90		9.73	
Psycho-social factors							
Resilience	Low normal	18.73	**<0.001**	24.13	**<0.001**	7.91	**<0.001**
	Normal	24.34		33.77		4.78	
	High normal	6.03		7.06		2.29	
Self-efficacy	Low	15.44	**<0.001**	19.78	**<0.001**	6.00	**<0.001**
	Moderate	19.09		26.46		6.98	
	High	26.55		36.49		4.12	
External stressors	Mild	15.61	**<0.001**	21.12	**<0.001**	3.52	**<0.001**
	Moderate	24.50		31.42		4.69	
	High	20.16		26.54		6.41	
	Severe	28.35		39.21		8.08	
Family problems	Mild	16.77	**<0.001**	22.57	**<0.001**	3.57	**<0.001**
	Moderate	18.41		23.34		7.78	
	High	19.28		24.92		6.11	
	Severe	29.48		40.71		7.71	
Interpersonal conflicts	Mild	15.08	**<0.001**	20.57	**<0.001**	3.69	**<0.001**
	Moderate	19.73		24.83		4.22	
	High	21.19		30.51		6.63	
	Severe	29.71		40.18		7.97	
Social support	Low	18.21	0.076	23.56	**<0.031**	8.32	**<0.001**
	Fair	22.32		30.06		5.01	
	Good	20.79		30.21		3.42	
Quality of life	Not good	15.06	**<0.001**	21.25	**<0.001**	7.44	**<0.001**
	Fair	17.30		22.70		6.12	
	Good	33.22		47.12		3.25	

Table 2 *(continue)*

Factors		PTSD		CG		Depression	
		M	*p*-value	M	*p*-value	*M*	*p*-value
Healing factors							
Received compensation	In process	21.41	0.804	27.31	0.523	8.87	**<0.001**
	Yes	20.97		28.93		4.51	
Solutions to the problems	No way/still suffering	34.58	**<0.001**	48.64	**<0.001**	4.87	0.484
	Religious principle	12.75		16.46		4.43	
	Understanding life	20.76		26.59		6.88	
	Family/ relatives/ friends	17.66		24.23		5.65	
	Self-awareness/ struggles / mindfulness/ tolerance	16.38		21.08		5.83	

Multiple Regression Models

The separated multiple regression model was fitted to the data for each outcome with its significant determinants (Table 2). A reduced model, produced by omitting the determinants with *p*-values exceeding 0.05 using backward elimination, is presented in Figure 2.

The reduced models gave the R-squared values at 0.63 for PTSD, 0.66 for CG, and 0.31 for depression. The model for PTSD had similar predictors as the CG model, except for the duration of loss. The pattern of predictors was also similar, with increasing scores of self-efficiency, external stressors, interpersonal conflicts, and quality of life, resulting in increasing scores for PTSD and CG. The PTSD and CG scores were higher than the mean for widows residing in Yala province. The widows with the high scores of resilience had the high scores for PTSD and CG. The widows with "no way" to solve their problems had high scores for PTSD and CG. For PTSD, widows aged 8 to 11 years of loss had the highest scores.

However, a different set of predictors was observed for depression. The high scores of depression were observed for widows who lost their husbands in other event types, such as being killed by burning or beheading and losing other family members, and they were also in the process of receiving compensation. The low scores of depression were observed for widows with high resilience and quality of life, mild external stressors, and family problems, and they received compensation from the government.
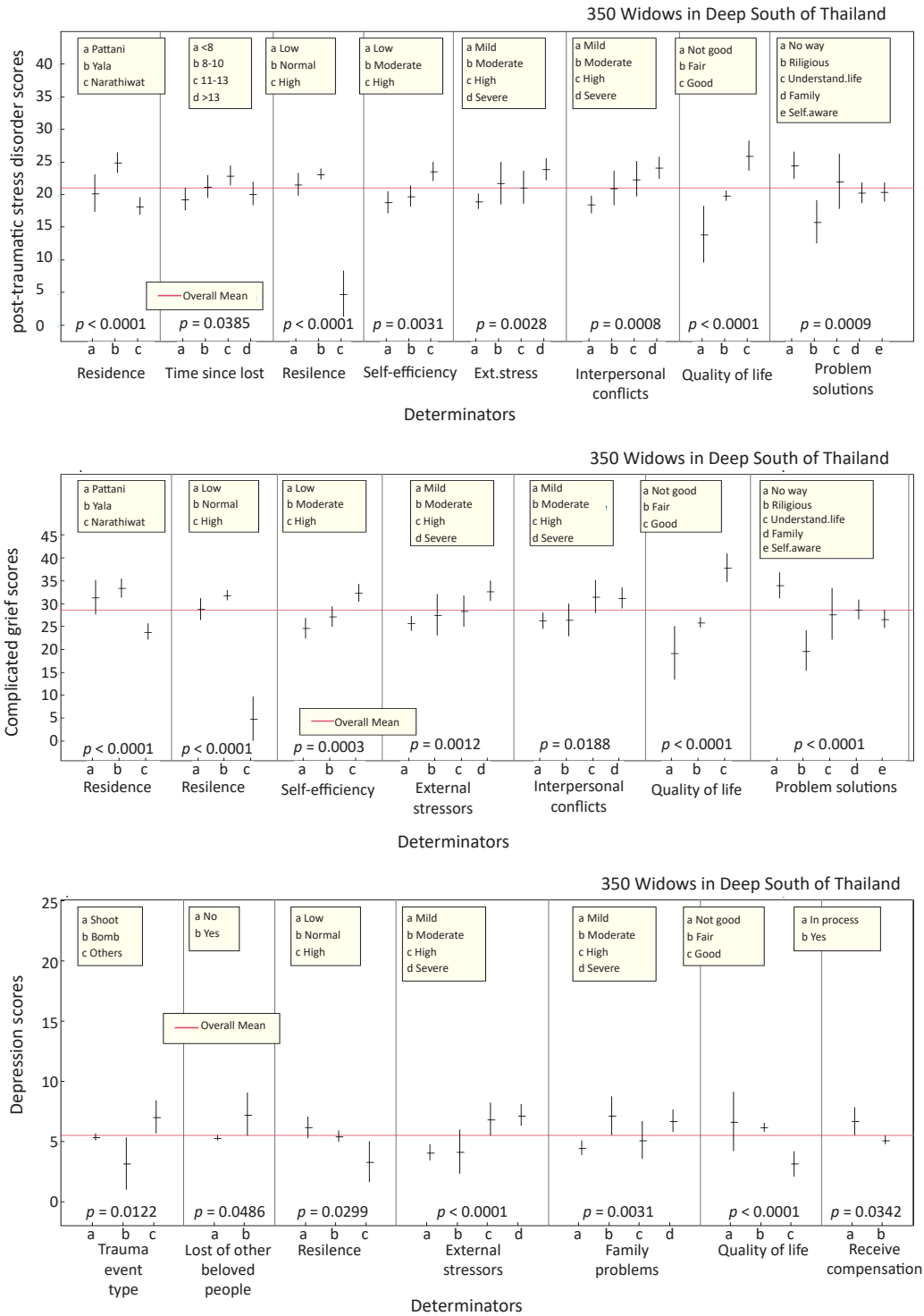
Figure 2. Results from multiple regression of PTSD, complicated grief, and depression among widows ($n = 350$)

DISCUSSION

The average score of PTSD was 21.06 (SD = 13.87), and 32% of widows met the PTSD criteria. This finding showed a lower score than the average PTSD score observed among terrorist-affected people after three years (Bryant et al., 2011). It was also lower than in a previous study on widows in the same situation (Prohmpetch et al., 2015). The average score of CG was 28.56 (SD = 19.69), whereby 48% of the samples met the criteria for CG. The scores were considered higher than the average CG in terrorist-affected people after three years (Bryant et al., 2011) but lower than among widows from the civil unrest in 2015 (Prohmpetch et al., 2015). The average score of depression was 5.48 (SD = 5.70), and 26.6% of these widows have depression. This score was considered lower than the average of Thai mental patients (Lotrakul et al., 1996).

The state of PTSD, CG, and depression was lower than in the previous studies under the same situation due to the longer period after trauma, and this period was negatively correlated with PTSD, CG, and depression (Park et al., 2015; Schaal et al., 2010). Moreover, the widows also faced a low frequency of violent situations, and facing violent situations was considered one of the risk factors for psychological problems. The Thai government supported the inflicted problems with budgets and specialists so these widows could access care and reduce psychological problems (Prohmpetch & Songwathana, 2018). This study's sensitive nature may have explained the low mean and percentages of PTSD, CG, and depression. Underreporting symptoms may also have been of concern for these widows, who might have been reluctant to disclose this information.

Most widows are bilingual, and a few speak the "Yawi," so this language might play a role in the study and introduce potential biases to the study findings. All widows were told to respond to the questionnaires with their willingness, and they could decline or cancel this participation at any time to reduce potential biases. Moreover, experienced psychologists facilitated and answered participants at the beginning and end of the session.

Furthermore, some widows met three criteria of PTSD, CG, and depression. Some met two criteria for both PTSD and CG, both CG and depression, and both PTSD and depression. These phenomena resulted from co-occurrence among PTSD, CG, and depression (Djelantik, Robinaugh, & Boelen, 2022; Komischke-Konnerup et al., 2021). According to the American Psychiatric Association (2013), PTSD, CG, and depression are highly comorbid. However, this issue would need further studies in cases of different contexts.

The association between the levels of the determinants and PTSD, CG, and depression could be measured by the cross-sectional nature of the data in this study, but PTSD, CG, and depression cannot be evaluated as a dynamic process (how being widows may have increased or decreased psychological problems in the population). In practice, the cross-sectional study was usually inexpensive and easy to conduct,

so it was useful for establishing preliminary evidence in planning an advanced study in the future.

Factors Affecting Psychological Problems: PTSD, CG, and Depression

In terms of residences in different provinces, Pattani widows had higher PTSD scores than Narathiwat widows but lower than Yala widows. This finding might indicate that most cases were widows living in the Raman, Krong Pinang, and Muang Yala districts in Yala, where the highest frequency of civil unrest events happened (Southern Border Incident Database Working Group, 2014). Widows who had 11–13 years of losing their husbands had more PTSD scores than the overall mean. The American Psychiatric Association (2013) mentioned that PTSD usually begins within the first three months after the trauma, although there might be a delay of months or even years. According to Hull et al. (2002), it was found that PTSD occurred 10 years after disasters. Therefore, this finding might be delayed in the case of 11–13 years of losses.

For the psycho-social factors, the widows who had low resilience had higher PTSD scores than those who had high resilience. Resilience was highlighted as an effective protective factor in treating PTSD (Horn & Feder, 2018). This finding also confirmed that the high resilience score presented the low PTSD score. The interview data also showed that most widows expressed their willingness to be aware of the situations, attended consultations, had tolerance and struggles, and perceived social support for facing current problems, whereby these expressions were considered the possibilities to increase resilience traits. Thus, it was confirmed that resilience was a protective factor that reduces the risk of persistent PTSD. The widows who possessed high self-efficacy had more PTSD scores than those who had low self-efficacy. The reviews found that the latter aspect of self-efficacy could help to cope with self-efficacy, and it is relevant to resisting or resiliently recovering from PTSD (Ford et al., 2015). It was possible since they lived within the unrest event (Treesuwan, 2020).

Widows with more external stressors had higher PTSD scores than those with fewer external stressors; however, external stressors such as work problems, family problems, and substance abuse could lead to an increased risk for the development of PTSD (Kydonieus, 2016). The widows with high interpersonal conflicts had higher PTSD scores than those with mild interpersonal conflicts, whereas those with severe interpersonal conflicts exhibited the highest PTSD scores. In addition, the interpersonal conflicts expressed negative emotions and thoughts with colleagues related to the PTSD scores. The interpersonal conflicts were considered the mediator which caused direct effects on the PTSD scores with regard to violence among single mothers (Samuels-Dennis et al., 2013), and the PTSD subjects were more likely to have more interpersonal conflicts with their parents, step-parents, siblings, peers, boyfriends/girlfriends, and relatives than non-PTSD subjects (Stander et al.,

2014). Pertaining to the quality of life, the widows without a good quality of life had lower PTSD scores than those with a fair or good quality of life. A high WHOQOL-BREF-THAI score should indicate low psychological problems after receiving treatment (Prasithsirikul, 2007), but this result contrasts with the expected situation.

Most widows who had a high quality of life had the conditions of the age between 40 and 59, living in Yala, facing suffering, having no way of solving their problems, being severely affected by external stressors, and having severe internal conflicts, which would probably be the main reasons why they had the high PTSD scores. According to Alvarez et al. (2011), there was no significant difference in the physical and social domains of a healing PTSD program in male veterans. It would be possible that some domains of quality of life were not associated with PTSD, and this finding was positively related to PTSD.

The samples with no solutions to their problems had higher statistically significant PTSD scores than those with fewer solutions. Psychological remedy and accessibility could reduce psychological problems (Songwathana et al., 2017), so the widows with no solutions to the problems and adhered to suffering reasoned out the fact that those who responded with the answer of no problem solutions had the highest PTSD score.

The model of the CG scores was similar to the PTSD model. Only the time duration of loss was statistically significant in the PTSD model but not in the CG model. The widows who lived in Pattani provinces had higher CG scores than Narathiwat widows but lower than Yala widows. This finding was the same as PTSD, which was influenced by more civil unrest events in the Raman, Krong Pinang, and Muang Yala districts in Yala (Deep South Incident Database, 2014).

The widows with low resilience had higher CG scores than those with high resilience. This finding could confirm that resilience was a protective factor that decreases risks against CG (King & Delgado, 2021). The widows who were low in self-efficacy had lower CG scores than those who had high self-efficacy. Self-efficacy might not be the only factor alone, but it also needs to work with other factors, for example, education and intelligence (Ford et al., 2015) and residences in the unrest event (Treesuwan, 2020). The widows with mild external stressors had lower CG scores than those with severe external stressors. This result resembled influences on PTSD, but the severe external stressors would be more likely to influence the CG scores than the PTSD scores. Nonetheless, both confirmed the evidence that high external stressors affected high PTSD and CG scores. In addition, the external stressors faced by the widows were similar to the findings from a previous study. Hollander (2016) reported the relationships between CG and external stressors.

For instance, families who miss experience were linked to many interrelated stressors, extreme poverty, conflict-affected areas, not knowing what to do as a person

and ambiguity. The widows who experienced mild interpersonal conflict had lower CG scores than those with high and severe interpersonal conflicts. The CG subjects were more likely to have interpersonal conflicts with their parents, stepparents, siblings, peers, boyfriends/girlfriends, or other relatives than the non-CG subjects (Stander et al., 2014). The high interpersonal conflict group exhibited higher CG scores than those with lower interpersonal conflicts (Mash et al., 2014). The widows who did not have a good quality of life had lower CG scores than those with a good quality of life. This situation was found to be controversial with other results since the quality of life was a protective factor against CG (Boelen & Prigerson, 2007). However, a study by Charney et al. (2018) found no difference in the quality of life between loss without CG and loss with CG. It could suggest that quality of life might affect CG differently depending on study groups, and it needed further investigation.

The widows with no solutions to the problems had higher CG scores than those with solutions such as holding strong religious principles, family-relative-friend support, and relying on themselves, like self-awareness, struggle, mindfulness, and tolerance, which might help widows cope with CG. This finding was similar to predicting PTSD. In other words, PTSD and CG were negatively and significantly affected by holding solutions such as practicing and following their religious principles firmly, getting support from significant people, and relying on themselves. Songwathana et al.

(2017) reported that the remedy experience of women who lost their family members involved self-empowerment, which came from putting religious precepts into practice, treating children as a moral stronghold, and strengthening willpower.

In terms of the trauma event types, other trauma event types, which were not the trauma of the samples' husband being killed by shooting and bombs, were related to depression. The widows who faced the trauma events of their husbands being killed by being burnt, attacked, and cruelly murdered had the highest depression score. Zisook et al. (2010) reported that violent deaths stimulated CG, and after 6 months, the widows might face increased risks for depression. The widows losing other beloved people, such as children, close relatives, or family members, exhibited higher depression scores than those who lost only their husbands. Similarly, Kristensen et al. (2012) found that the number of losses of family members was predicted to indicate depression.

Widows who had low resilience exhibited a high level of depression. This factor was similar to both affected PTSD and CG protective factors. This result confirmed the evidence shown in many studies that resilience increased the risk of not being depressed by about twofold (Edward, 2005; Park et al., 2015). In terms of the external stressors, it showed that the severe external stressors had a statistically significant depression score rather than the mild external stressors. This finding also affected the external stressor predictors,

similarly influencing PTSD and CG. For the influences of risk factors, external stressors such as stressful environments, financial problems, low social status, greater daily stress, and others were positively related to depression (Razzak et al., 2019). For family problems, it showed that severe family problems had more statistically significant depression scores than mild family problems. Mason et al. (2020) reported that family problems were risk factors related to depression. The widows who had a "not good" quality of life had more depression scores than those who had a good quality of life. Similarly, people with major depression perceived a worse subjective quality of life than non-depressive people (Hansson, 2002). In receiving compensation, widows waiting to receive compensation had more depressive scores than those who already received compensation. Similarly, Lorant et al. (2007) found that increases in financial strain or deprivation of financial strain raised the risk of depression.

This study suggested three common predictors related to the psychological problems among PTSD, CG, and depression: resilience, external stressors, and quality of life. The widows with low resilience and high external stressors had high PTSD, CG, and depression scores. This finding suggested that widows might be healed of PTSD, CG, and depression if they receive enhanced resilience and reduced external stressors. The finding also revealed that the widows with good quality of life and the higher scores of PTSD and CG need further investigation. Further studies are required to examine the influences of this factor.

Some limitations were presented in this paper. Firstly, data collection from the widows came from different processes. The psychologists interviewed most widows; however, a mobile phone and a Google form were used in insecure or unsafe situations. It might provide inconsistency in the data. Secondly, recall bias might occur because some widows faced losing situations for many years, and recalling the real situations was difficult to depict the exact happenings. Thirdly, bias may have occurred when the data were collected because all instruments for which there had been no validated translations in the Yawi language were translated and translated back into Thai. Finally, a sampling technique used in this study was a non-probability sampling method, so the results were merely specific to widows losing their husbands from the civil unrest in Thailand's Deep South.

CONCLUSION

The findings exhibited that many predictors affected PTSD, CG, and depression. Those factors might then discriminate to be the protective and risk factors for clear descriptions of the causal model of psychological problems among the widows after losing their husbands from the violent situations. Both common factors (Protective factors: Resilience and quality of life; risk factors: External stressors) and unique factors (time since loss, trauma event type, family problems, and receiving compensation) could affect psychological problems. These findings could become a guideline for determining a mental health plan, promotion

of intervention, and prevention and solutions to psychological problems. Psychological problems prevention and control efforts should be reinforced, particularly considering widows' residence. Moreover, this psychosocial intervention should cover the prevention of depression, so it would be able to prevent family problems, be compensated, and be aware of severe types and the number of losses of beloved people. The application of effective psychosocial interventions specifically should aim at increasing resilience and reducing external stressors for bereaved widows. It can also be used in the creation of easy accessibility for mental health services among widows living under civil unrest and other places of similar contexts. Furthermore, this may need a thorough study on the common and unique factors of PTSD, CG, and depression among these Thai widows. For example, qualitative research should be conducted to highlight the details of the factors affecting psychological problems, including cultural influences.

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Multi-dimensional Gender Perspective in Historical Narrative Structure of A. S. Byatt's *Possession: A Romance*

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ABSTRACT

This study explores gender issues in the historical narrative structure of A. S. Byatt's novel *Possession: A Romance* (1990) by critically examining women's exclusion from society, men's identity crisis in gender environments, and the separation and union between two sexes in the novel. To reveal these complicated gender issues, Byatt combines history with narrative, which accords well with Hayden White's historical narrative that fictive history can unveil historical truth. Additionally, Byatt's three levels of historical narratives echo Giambattista Vico's cycle of history to reveal the recurring gender issues in human history. In this respect, this study investigates how Byatt uses historical narratives to examine gender dilemmas of men and women to explore how characters free themselves from their gendered travails. In conclusion, Byatt employs historical narratives to reveal the recurring gender dilemmas and gender opposition in the history of human development. Meanwhile, Byatt is seeking a new type of gender relations in the cycle of human history as well—it is androgyny that liberates men and women from the limitation of defined gender roles and dissolves gendered conflicts to realize the union between body and soul in men and women.

Keywords: A. S. Byatt, androgyny, cycle of history, gender issues, historical narrative

INTRODUCTION

For feminists, gender is not an essential quality for a person but "performed" (Butler, 1999, p. 175), and gender studies, thus, mainly explore gender constructs defined by

social norms and expectations. It discloses that the real purpose of such constructs is to maintain the patriarchal system of power and to create a consciousness among women that "the masculine principle is always the favored 'norm' and women the outsiders" (De Beauvoir, 1984, p. 295). However, the gender perspective cannot be narrowed down to the feminist perspective, for the study of gender should not merely encompass women's experiences and perspectives but also require a complete understanding of men and the relationship between men and women (Sedgwick, 2007). Byatt is one such novelist, dedicating herself to exploring the relationship between women and men and reconstructing their identities throughout her literary career. By depicting women's social status, thoughts, and their relationships with others, Byatt (1993) attempts to show her liberal and humanistic concern for women when she confesses to her readers "how she wishes women to be normal…." (p. vii), for them to be treated equally to men.

Furthermore, Byatt's male characters, who occupy a significant position in her exploration of gender issues, are largely intellectuals shaped by specific social and historical conditions. Her special concern about gender issues is woven throughout every aspect of her first Booker-Prize-winning *Possession: A Romance* (1990), which has also earned plaudits from the public and critics for its original narrative structure. However, previous studies in the existing criticism of Byatt's *Possession* from a combined perspective of gender relations and historical narratives are relatively

rare (Farahmandfar, 2017; Wells, 2002). Against this backdrop, we argue that the novel *Possession* provides profound insights into the endeavors of men and women who seek a new type of gender relations amidst the recurring gender dilemmas in human history. In pursuit of this argument, this study investigates how Byatt uses historical narratives to examine gender dilemmas of men and women to explore how characters free themselves from their gendered travails.

The present study draws upon Hayden White's historical narrative and Giambattista Vico's cycle of history to achieve this goal. The theories examine male and female characters' difficulties when associating with the opposite sex and their efforts to improve their gender relations in the novel. For Hayden White, historical narrative unveils truth obscured by history in fictive stories. By recording "the histories of the marginalized, the forgotten, the unrecorded" (Byatt, 2001, p. 11), historical narratives make it possible to explore such gaps and create plausibility, attaining or approximating submerged historical truths. In like manner, Giambattista Vico's cycle of history helps to exhibit the recurring gender issues in the course of human history. With each generation mirroring those that have come before, the cycle of history is a kind of cultural reflection that makes it possible to examine the gender problems depicted in the novel. The law of "history is progress" (Vico, 1744/1984, p. 22) also shows that solutions to gender issues always exist in the cyclical nature of human history.

Literature Review

Literary scholars have employed many theoretical frameworks to analyze Byatt's novel *Possession: A Romance* (1990). Farahmandfar (2017) in his research examined the use of historical narratives to reveal the truth of the past in *Possession*, which "reclaim the 'ex-centric' voice of women…that has, for a long time, been silenced or at least driven to the margins by patriarchal practices of history" (p. 479). Ioannidou (2020) further illustrated restrictions that gender imposed on women writers in the Victorian era. Ioannidou observed that poetic creation helped LaMotte develop her identity as a poet, which empowered her against Victorian norms that enslaved and degraded women and provided her with a means of expressing her emotions and the challenges she faced. However, she was only "a sort of poet", as opposed to a "real" one like her counterpart, the male poet Ash, since it was not easy for women to develop a career as a writer in the Victorian age (p. 417). The current study further supports the work of Farahmandfar and Ioannidou by showing how historical narratives record the unrecorded in the past and expose the confinements imposed on women in the patriarchal Victorian era. However, our study explores women constrained by gendered distinctions in patriarchal systems and examines men's predicament within the defined culture.

Pereira (2019) discussed women's autonomy in two fairy tales of Byatt's *Possession—* "The Glass Coffin" and "Gode's Story"—and concluded that Byatt's use of fairy tales communicates women's confined living conditions and establishes expectations that women will live lives of an "autonomous and self-sufficient being that strives" (p. 320). Zhang (2021) went considerably further in their exploration of the factors that contribute to women achieving autonomy, and he claimed that "solitary and isolation become the norms of literary creation, especially for women artists" (p. 43). Additionally, Zhang (2020), in another article, "The Cauda Pavonis and Byatt's Female Visionary in the Tetralogy", associated female creativity with the notion of androgyny. Zhang (2020) argues that autonomous female artists are androgynous—"the union of opposites", representing "fertility" as well as "creativity." Furthermore, the interaction between androgyny and femininity supports Byatt's creation of characters such as Melusine and LaMotte in *Possession*, who echo the "essential androgyny of the creative mind…" (p. 412), in which gender expression transcends the confines of the masculine-feminine binary.

In the above studies, Pereira (2019) perceives that gender confinements can be destabilized when women learn to be "autonomous and self-sufficient"; Zhang indicates that solitariness and isolation are *sine qua non* for women artists' literary creation that enables them to gain autonomy. In addition, Zhang argues that female artists are androgynous, the union of fertility and creativity, a union that transcends the restriction of "inherent" gender duality. In particular, these studies attempt to separate

women from gender relations by cutting the connection between men and women, while the current study examines the experiences of men and women within such defined gender relations and explores how they may be freed from their gendered difficulties. Additionally, the notion of androgyny in this study represents the union between two sexes in body and soul rather than the understanding that it can exist beyond gender relations.

Wells (2002) discussed the trajectories of history when examining Giambattista Vico's conceptualization that "history is progressive". Wells refuted the view of Byatt's *Possession* that contemporary culture regressed into "a state of paralyzing skepticism" in contrast with Victorian culture (p. 669). Instead, Wells argued that the value of self-conscious cultural reflection made the salvation of the deteriorating postmodern culture possible. Wells and we employ Vico's cycle of history to explore Byatt's *Possession*. Wells focuses on an investigation of the progressiveness of history from a cultural perspective, while the current study examines the recurring gender issues revealed by the juxtaposition of historical periods. According to Vico, "history is progressive"; thus, the solutions for gender inequality can also be revealed by the cyclical nature of human history. Byatt (1990) states in the novel that "body and soul are not separable" (p. 373), and the concept of androgyny precisely signifies such expectations for gender relations. Through uniting masculinity and femininity, androgyny creates a sense of wholeness

for individuals and establishes harmonious gender relations.

Therefore, this study explores gender issues of A. S. Byatt's novel *Possession: A Romance* (1990) in the framework of Hayden White's historical narrative and Giambattista Vico's cycle of history, by critically examining women's exclusion from society and men's identity crisis in gendered environments, as well as the separation and union between two sexes in the novel. It concludes that Byatt's construction of androgynous gender relations liberates men and women from the limitations of defined gender roles and dissolves gendered conflicts to realize the union between body and soul in men and women.

THEORETICAL FRAMEWORK

Byatt and Hayden White's Historical Narrative

Traditionally, historians contend that history can represent reality faithfully and objectively. However, postmodern historians challenge the idea of history as a science and consider history textual, open, plural, and uncertain. The postmodern historian, White (1990), defines history as a "verbal structure" (p. 9) or a tool that employs the linguistic and rhetorical structures of a narrative. Rather than a reality simply waiting to be transparently communicated in language, the construction of history has led to a greater focus on the role of narrativization (White, 1990). Accordingly, White (1975) outlines three models that can be applied to historical

discourse: (i) "explanation by emplotment," (ii) "explanation by argument", and (iii) "explanation by ideological implication" (p. 7). These three models suggest that historical texts are poetic, imaginative, and fictive. To White, emplotment is assembling a series of historical events into a narrative with a plot. Considering this, White (1975) identifies four modes of emplotment: romance, tragedy, comedy, and satire, and argues that all histories are narrative discourses about the past, shaped, crafted, and formed by emplotment. History, therefore, has been transformed into a narrative model for fiction. Historians not only "find" stories but also "invent" as a fiction writer does (White, 1975, p. 8). The significance of White's theory lies in his destabilization of the scientific foundation of history, narrowing the distance between historical discourse and literary narratives.

Byatt acknowledges her debt to Hayden White, whose historical views greatly influenced her creation of historical fiction. In Byatt's book *On Histories and Stories* (2001), she discusses Hayden White's view of history and narrative: "Narrative is simply there, like life itself . . . international, transhistorical, transcultural" (Byatt, 2001, p. 10). She further examines White's investigation of narratives in fiction and thoroughly explores the relationship between fiction and history, insisting on the position of "fiction expressing history" (p. 9) and how history aims to unpack the actual events of the past and their narrative. Among Byatt's historiographic metafictions, she has rewritten historical events or personages,

myths, legends, and folklores interwoven with plots to construct whole stories. In contrast to other historical novelists who repudiate any access to the past, Byatt believed in the power of narrative to reveal the truth about the past. History employs narrative structures with color and metaphor "to keep past literature alive and singing, connecting the pleasure of writing to the pleasure of reading" (p. 11). Accordingly, history became a form of "textuality", a way to reconstruct the past through imaginative fiction "that makes fact alive as a kind of truth" (p. 42). Enlightened with "one very powerful impulse", Byatt dedicated herself to writing "the histories of the marginalized, the forgotten, the unrecorded" (p. 11). She writes about women excluded from official versions of the past and men who suffer from identity anxiety in gendered environments. Byatt has faith in the power of historical narratives that can reflect history and bring what has been marginalized to the fore.

Byatt and Giambattista Vico's Cycle of History

Instead of traditional historical narratives employing a single form of discourse, Byatt's novel *Possession* employs multiple forms to present a rich tapestry of history. Plots and discourses are organically integrated on the historical level to form a unique narrative style of her own, which refreshes traditional historical narratives as Byatt (2001) stated, "old tales, new forms" (p. 5). The use of the creative structure of historical narratives in Byatt's novels is significantly influenced by Giambattista

Vico's cycle of history. Vico proposed a recurring cycle of history in his *New Science* (1984). He argued that human history proceeded in a recurring cycle (ricorso) of three ages: the divine, the heroic, and the human. Frye (1981) then developed into the mythical age, or the age of gods; a heroic age, or the age of an aristocracy; and the age of the people. Each age exhibited distinct political and social features and can be characterized by language. In addition, these three ages constitute the history of human development. Vico (1744/1984) envisioned history as progressive, as "Each generation or 'time-form' occupies a space on an overall continuum, or 'corso', which follows a trajectory over which a society develops from a primitive to a more advanced state" (p. 22). With each generation mirroring those that have come before, the cycle of history is a kind of cultural reflection that makes it possible to examine the gender problems depicted in the novel.

In *Possession*, Byatt takes various historical stages of human experience as the novel's narrative content: the ancient mythological era, the Victorian era of a century ago, and the contemporary era at the end of the 20th century. These three historical times roughly correspond with the eras of gods, heroes, and people, as described by Vico. The first narrative level is the narrator's description of the Western academic community in the 20th century, which reflects the contemporary social landscape. Scholars Roland and Maud found many historical texts when they uncovered a secret history of 19th-century literature. The

letters and diaries from the two Victorian poets, LaMotte and Ash, constitute the second narrative layer. In the letters, many myths, epics, and folklore rewritten by the two poets tell the stories of others that have persisted from the mythical age, implying a third narrative level. The three-level, interwoven historical narrative clearly and naturally forms a retrospective tracing from the contemporary to the Victorian period and then to the ancient humans, thus presenting the stories and historical landscapes of three different historical periods. *Possession* reveals Byatt's concern for gender issues from different perspectives through these three historical narratives. The narratives of each age interact with each other to draw a rich picture of human history. Hayden White and Vico influence Byatt's view of history, and her multi-layered narrative in *Possession* enriches the ancient historical context and vividly presents the historical development of gender issues.

METHODOLOGY

The present study examines gender issues in A. S. Byatt's novel *Possession: A Romance* (1990) in historical narratives. More specifically, *Possession*'s narrative techniques are based on Byatt's historical views, theoretically structured by Hyden White's historical narrative and Giambattista Vico's cycle of history. The main data collection method from this theoretical framework would be a textual analysis of the novel. Specifically, the study follows the narrative structure from the ancient times through the Victorian age until the

contemporary period to explore gender issues that have existed since ancient times. By examining marginalized women whose talents are buried, as well as men who suffer from gendered identity crises in different eras, the study aims to achieve the first objective. According to Byatt (2001), historical narratives disclose "the histories of the marginalized, the forgotten, the unrecorded" (p. 9). She constructs three historical times in which she writes about multiple female characters who are neglected and suppressed because of their sexual identity and men who are frustrated and fearful of love and intimacy with women. Byatt records the recurring gender struggles of men and women throughout human history while seeking ways out. Therefore, the present study investigates the separation and union of the two sexes to achieve the second objective. Female utopia and asexuality are expected to expel the opposite sex in terms of body or emotion to maintain autonomy, which worsens gender relations and imprisons the self. A new type of gender relations based on unity and coexistence, which precisely aligns with Byatt's expectation that "body and soul are not separable", can be considered through the lens of androgyny (Byatt, 1990, p. 373).

Text

Byatt's Booker-Prize-winning *Possession: A Romance* (1990) is the present study's primary data collection and analysis source. It details two interrelated stories of contemporary critics, Roland Mitchell and Maud Bailey, who investigate the

lives of two Victorian poets, Christabel LaMotte and Randolph Henry Ash, through the unexpected discovery of a secret correspondence between them. Through its complex narrative structure, the novel explores a variety of gender-related mechanics and presents the living conditions of both genders through the interaction of the contemporary world and the Victorian past, which is directly related to the central argument of this study.

RESULTS AND DISCUSSION

Gender Dilemmas of Two Sexes in Historical Narratives

Confined Women in Gender Identity. It is notable that female predicaments are viewed diachronically and investigated both in the two main plots and the novel's many embedded subplots and poems. When narrating the Victorian past, Byatt intentionally employs "emplotment" (White, 1975, p. 8) and creates new narrative lines to give voice to "the marginalized, the forgotten, the unrecorded" women whose intelligence has been neglected by male authoritative discourse (Byatt, 2001, p. 11). Ellen Best, the wife of the famous Victorian poet Randolph Ash in *Possession*, is a neglected intellectual woman. She ruefully notes in her journal:

> I hit on something I believe when I wrote that I meant to be a Poet and a Poem. It may be that this is the desire of all reading women, as opposed to the reading men, who wish to be poets and heroes but might see the inditing

of poetry in our peaceful age as a sufficiently heroic act (Byatt, 1990, p. 122).

Ellen voices the distress of intelligent Victorian wives of male geniuses, normally restricted by their "housewife" identity. They live in the shadow of their husbands' glory and become "outcasts" in a male-dominated world (Wallhead, 1999, p. 237). As a "woman in the shadow," Ellen once dreamed of becoming a poet, but this ambition faded after marriage. Upset by what her life has become, she then secretly starts writing journals to record her thoughts. While most contemporary scholars believe Ellen's life and journals are dull, feminist critics rediscover her talents and argue that her husband restrained her literary brilliance and imagination. Like Ellen, Proserpina is a goddess abducted by Pluto and imprisoned in the Underworld in Ash's poem. Her husband also dominates her.

By contrast, female characters in the contemporary world of Byatt's novel are ambitious and devote themselves to academic careers. However, in the architecture of an overwhelmingly male-dominated society, literary women: "are enclosed, inevitably, trapped in the specifically literary constructs which male writers controlled" (Gilbert & Gubar, 1980, p. vii). Beatrice Nest is a documentary expert who leads a simple life as a single woman, and she dedicated twenty-five years to studying the great Victorian poet Ash's wife, Ellen. In this way, two women from different times are connected by the enduring unfair treatment because of their gender. Initially, Nest was

obsessed with Ash's poetry, yet her tutor's words, "What contribution to knowledge did she hope to make, could she be sure of making?" (Byatt, 1990, p. 127) discouraged her and persuaded her to take up document editing as it was more suitable for her gender and ability. She is thus forced to bury her love for Ash's poetry and turn her interest to the "cute boring woman" Ellen instead but finds nothing valuable in her research. Even though Nest ranks among contemporary scholars, she is a marginalized scholar whose ability has been questioned because of her gender, like her counterparts Ellen and Proserpina. Although from three different eras, the tradition of women's subordination since ancient times echoes throughout the novel.

Frustrated Men in Gender Relations. Vico (1744/1984) argues that "the present [is] only intelligible if one [knows] how its traditions, beliefs, and way of thinking [have] evolved from the past" (p. 16). Along similar lines, Byatt (1990) writes, "those past voices and lives whose resuscitation in our own lives as warnings… is the business of every thinking man and woman" (p. 104). Apart from being concerned about the problems women faced throughout human history, Byatt also examines the predicaments and difficulties that men encounter.

At the story's opening, Roland Michell, a contemporary scholar, accidentally finds some letters in Giambattista Vico's book *The New Science* and later learns that the letters were from Victorian poet Randolph

Henry Ash to one Christabel LaMotte. Thus, a secret romance was revealed. In a sense, Vico and his *The New Science* generate the plot, connect the past with the present and fiction with fact, and reveal the "textuality" of history, a way to reconstruct the past (Byatt, 2001, p. 42). Roland obtains new knowledge about the Victorian poet Ash in reconstructing the past. Ash is commonly recognized as a successful man in his career and marriage. He fell in love with Ellen at an early age and waited for fifteen years before she decided to marry him. Due to Ellen's fear of men and sex, their marriage was never consummated, and they maintained their asexual marriage for forty-one years. Later, Ash meets and experiences an immediate attraction to his contemporary poetess, Christabel LaMotte, and they develop a secret romance through correspondence. The unexpected love inspires Ash to write many love poems different from his previous ones on the subject—"Ash's great love poetry was inspired not by his wife, but by a mistress" (Wallhead, 1999, p. 180). Their combination of body and soul evokes in Ash a profound and long-lasting love, even enduring until the final moments of his life. Although Ash implicitly accuses LaMotte of coldness and mercilessness in his last letter to her, the reader can feel his love for LaMotte between the lines. Ash later died of illness and passed away in a pitiful state.

The contemporary scholar Roland Michell also suffers anxiety regarding gender relations and his academic career. Unable to shoulder the responsibility as a breadwinner, Roland's dignity is challenged in his relationship with her girlfriend Val, as he "saw himself as a failure and didn't want to do anything so decisive, in terms of himself and Val" (Byatt, 1990, p. 16). Instead of following contemporary, popular literary trends in his academic career, Roland studied the Victorian poet Randolph Henry Ash, who was considered outdated. His neglected academic career results in his economic inferiority: Val assumes the role of a breadwinner, and Maud patronizes him during their research. Emotionally, Roland is attracted to Maud, who has already acquired fame and authority in the academic world at that time, but his awareness of the disparity in their social status prevents him from admitting his true feelings to Maud: "Maud was a beautiful woman such as he had no claim to possess. She had a secure job and an international reputation…but in almost all incompatible" (Byatt, 1990, p. 459). Therefore, he withholds his feelings, hesitating to express his love. Only when Roland finally gets offers from multiple universities does he dare to suggest they could love each other "in a modern way" (p. 530). This success inspires Roland to confess his love. Therefore, Byatt (1990) ironically comments, "How true it was that one needed to be seen by others to be sure of one's existence. Nothing in what he had written had changed, and everything had changed" (p. 508).

Historical narrative, as a "verbal structure" of history, is poetic, imaginative, and fictive (White, 1975, p. 9). Byatt's three levels of historical narrative vividly display human groups of women and men

from the mythical times, the Victorian age, and the contemporary age, forming a landscape of human history. There are mythological figures Proserpina, Victorian wife Ellen, and Contemporary scholar Nest, who have been dominated, forgotten, and questioned because of their female identity. Among male characters, Ash is a literary giant of the Victorian era, renowned for his intelligence and talent, but he is impotent in handling relationships with women. At the same time, contemporary scholar Roland's inability to fulfill the supposed masculine responsibilities of being a successful man and breadwinner is defined as a "failure" (Byatt, 1990, p. 16). Three levels of historical narrative, echoing Vico's cycle of history of the human, the heroic, and the divine, depict the recurring gender dilemmas of men and women. It implies the "truth" behind the historical "textuality" that it is precisely the gender construction of patriarchy that has led to the predicament of both sexes (Byatt, 2001).

From Separation of Body and Soul to Union

In addition to revealing the recurring gender dilemmas confronted by men and women in historical narratives, A.S. Byatt seeks ways out of the depressing gender travails in the cycle of history. She investigates the "separate autonomy" that emphasizes isolation from the opposite sex to gain self-autonomy (Steveker, 2009; Zhang, 2021) as well as the "inseparable body and soul" that advocates the union of both sexes (Byatt,

1990). The following discussion will unfold from the two points.

Female Utopias and Sexual Fear—Separation of Body and Soul. In *Possession*, Byatt includes a female utopia to indicate that women could live independently without being subordinate to men. This conception is mirrored by Elaine's description of the Amazon utopia "as a country entirely populated by women and completely isolated from the male world" (Showalter, 1977, p. 4). The LaMotte-Glover Bethany house can be regarded as a women's utopian world. Both passionate about artistic creation, LaMotte and Miss Glover live peacefully together, exchanging their thoughts through art. The "LaMotte—Glover" style utopia in *Possession* reflects the self-awakening of female consciousness, showing that women can live the life of the mind and make a difference through art. However, this utopia ends in tragedy because of the intrusion of the male poet Ash. Byatt indicates that women's utopia is fragile when intruded upon by men.

Byatt's female characters like Ellen and Maud, who are from different historical backgrounds, suffer from the fear of sexual intimacy, which mirrors D. H. Lawrence's assertion that "the mind has an old groveling fear of the body and the body's potencies" (Lawrence, 1930, p. 5). Ellen and Ash's marriage remains an asexual marriage due to Ellen's fear of sex. Since Ellen fails to complete what she views to be her wifely responsibilities, she does her best to please her husband as a slave, even

though she is aware of Ash's betrayal in marriage. Rather than fighting for rights in their marriage, Ellen chooses to be a good Victorian wife who bears the betrayal. If Ellen and Ash's marriage is asexual, then the modern relationship between Fergus and Maud is completely physical. Their fragile relationship is comprised of a sexuality that is fully erotic rather than love. This carnal relationship casts a deep shadow on Maud's psychology. She refuses any possibility of emotional intimacy with a man, and the idea of marriage never occurs to her. Indeed, many women are afraid of married life with men and subconsciously refuse to enter the male territory of the family. In *The Second Sex* (1984), De Beauvoir discusses marriage anxiety in women and lists extreme behaviors they might adopt, such as pretending to be sick or suicidal, to escape marriage. In *Possession*'s mystical stories, the "Crystal Coffin" princess would rather be cursed to sleep in a crystal hall for a hundred years than marry.

Female utopia and asexuality, though different in form, are essentially expected to be free from gender constraints and live "autonomous and self-sufficient" lives by separating themselves spiritually or physically from men (Pereira, 2019). Victorian wife Ellen detaches from her husband sexually, leading to her emotional enslavement. Maud conceals her femininity by hiding her beautiful long hair to keep an emotional distance from men. However, such self-autonomy based on cutting off the connection between men and women is unreliable, as "fully self-sufficient and

isolated consciousness cannot possibly exist…Separation from the other can only result in the loss of self" (Bakhtin, 2010, p. 287). Byatt's plot of male intrusion to disintegrate female utopia in the novel illustrates that separated gender relations violate her expectations that "body and soul are not separable" in the relationship between men and women (Byatt, 1990, p. 373).

Androgyny: The Union of Body and Mind in Two Sexes. In *The New Science*, Vico explains that history is recurrent, cyclical, and progressive. At the crucial point at the end of the "corso" (cycle)—there would come a moment of retrospection, or "ricorso", during which a society can save itself by repeating more primitive time-forms in their most valuable aspects (Wells, 2002, p. 674). In *Possession*, Byatt indicates that there is a "ricorso" that relieves the gender travails that existed throughout human history. She creates many major characters—such as Ellen, Maud, and Val—who constantly complain that "love is terrible" but still eulogize the love between Ash and LaMotte, while it is love that acts as a cure for Maud's fear of sex. In this way, Byatt seeks to establish a union between body and soul between the two sexes, and this kind of union can be considered through the lens of androgyny.

In the novel's Victorian narratives, Byatt takes LaMotte and Ash's love story to reveal the androgyny they embodied. Ash, as portrayed by Byatt, is very different from the other characters in her work. Apart from

his artistic talent, Ash also shows his respect and understanding for Victorian women, "Through Ash, Byatt explores the possibility of being a male sympathetic to feminism in the nineteenth century" (Campbell, 2004, p. 132). Ash addresses LaMotte as his equal and shows her his respect and admiration. Additionally, his writings are greatly influenced by the brilliant poetess. Compared with his previous poems, which are full of masculinity, Ash writes poems with feminine tenderness when in a loving relationship with LaMotte. The transformation of his writing style from masculine to a combination of masculine and feminine indicates Ash's androgynous mind. According to Woolf (1929), androgyny unites masculinity with femininity in individuals to challenge gendered conceptions of consciousness. It allows men to attain selfhood by recognizing the "courage to be tender", while women attain selfhood by having a sense of their destiny, and the androgynous individual is characterized by a "completing" of their psyche (Kenyon, 1988, p. 51). As an intelligent poetess, LaMotte is a woman with independent thoughts. She establishes a lesbian utopia with Miss Glover to protect women from men's oppression. In this sense, LaMotte is a fighter with a strong will and courage, which indicates masculinity in mind. When LaMotte meets Ash, she is attracted by his brilliance and melts into Ash's fiery and sincere love, Ash's encouragement, understanding, and love to open her previously sealed heart and awaken her desire for true love.

Inspired by love, appreciation, and respect, she completes two impressive epics—*The Fairy Melusina* and *The City of Is*. The Ash-LaMotte romantic relationship is initially based on "art, the intellectual life, and an interest in Melusine" (Franken, 2001, p. 99). The mutual influence of the ideal Victorian poet and poetess on one another exemplifies Byatt's androgynous conception of the fusion of male and female forces in artistic creation. It is androgyny that makes them transcend the barriers of gender to a spirit of reconciliation (Heilbrun, 1973, p. 10). Spiritual unity, in turn, promotes the union in the body, which makes possible the realization of androgyny mentally and physically. However, it is regretful that Ash—LaMotte's androgynous zeal is not sustained as Ash cuts himself off from LaMotte in the latter part of his life.

In contrast, Maud Bailey and Roland Michell from the contemporary narratives appear as figures that can succeed in their respective interpretive projects, creating the circumstances in which postmodernity can experience the benefits of the "ricorso". Maud is a LaMotte scholar in the Women's Resource Center, and Roland holds a Ph.D. in the Ash Factory. Maud's connection with LaMotte reflects their kinship and shared thoughts and qualities: they share intelligence in creation and solitude in life. To live according to her feminist beliefs, Maud appears inaccessible to men and attempts to separate herself from her femininity. She hides her beautiful long hair, "always inside some sort of covering, hidden away" (Byatt, 1990, p. 65). In addition, she

projects traits associated with masculinity to be taken seriously in the academic world. Compared with Maud, Roland is a loser in life and his career. He dedicated himself to unpopular research fields and was ridiculed by his colleagues. His girlfriend has assumed the breadwinner's role, seriously damaging his masculinity. He experiences feelings of inferiority in his career and relationships. While delving into the past, both Maud and Roland change. Maud reassumes her sense of personal and societal identity. She frees her hair and femininity, showing a more integrated sense of self about others that "concedes sexual difference but allows for both desire and equitable treatment" (Wells, 2002, p. 687). Her relationship with Roland symbolically unites the past with the present and her masculinity with femininity. Maud's androgynous traits enable her to reexamine her relationship with men. Roland develops a more clearly defined identity as a social being and an academic. He no longer feels inferior to Maud, who eventually becomes his lover and attains a new level of professional respect. As the two scholars investigate the past, they gradually gain a balanced understanding of one another and even spend time reading about the other's preferred writers and discussing their thoughts. Meanwhile, Roland is inspired by Maud's academic confidence, and Maud's respect and support also encourage Roland to approach her during their research. Maud and Roland develop a bond based on mutual respect, challenging, stimulating, and fostering each other's growth, which exactly confirms the androgynous state as

Cixous (1988) describes: "the one enhances and brightens the other. The two of them equal in stature, in power, in the richness of soul, in the mobility of spirit, equal in virtue…" (p. 47). This personal growth brings them together and, therefore, initiates the spontaneous, revitalizing repetition of the "ricorso", which has lasting positive effects on themselves and broader gender relations. They arrive at "a modern way" of managing their romance, which enables them to realize the unity of body and mind.

A new type of gender relationship, not based on separation and opposition but on union and coexistence, corresponds to the male-female relations described by androgyny. It is worth noting that androgyny here represents the union between two sexes in body and soul rather than the understanding that it can exist beyond gender relations. Through uniting masculinity and femininity, androgyny creates a sense of wholeness for individuals and establishes harmonious gender relations. In the two couples Ash-LaMotte and Roland-Maud, their spiritual understanding promotes their union in the body, which makes possible the realization of androgyny mentally and physically, and this union also has significant effects on themselves and gender relations.

CONCLUSION

As a historiographic metafiction, *Possession* highlights the continuity between history and reality when comparing fictional history with fictional reality, which also connects the past with the present. Different historical

periods intermix to form a unique narrative structure. Through a dialogic relationship with the past, it lays bare the recurring gender issues throughout the history of human development. Byatt shows women's living conditions in the ancient mythological era, Victorian England, and contemporary society. She expresses her sympathy for female dilemmas and fairly examines men who encounter predicaments and anxiety in gender relations as well as their careers and highlights how their difficult situations are significantly influenced by their social and cultural environment. Byatt is concerned about the relationship between men and women, and she investigates the separation and the union of genders. Although Byatt adopts a negative attitude towards love and marriage, she still wishes to rebuild relationships between men and women and indicates that androgynous gender relations may be the ideal way to realize the harmonious coexistence of men and women and to fulfill the union of body and soul. Although from different eras, the couples Ash and LaMotte and Maud and Roland echo each other to form a grand historical development of gender relations. The model of sexes' coexistence essentially expresses Byatt's faith in gender relations that men and women can transcend gender limitations and enjoy harmony in body and soul. However, such a model of androgyny still invites us to ponder, and some questions need to be answered. Since androgyny represents the ideal relationship between the two sexes, why can't it be sustained? Ultimately, romantic love between Lamott and Ash ends

tragically with decades of separation and Ash's death, while Roland and Maud will eventually face separation as Roland accepts a new job overseas. Such outcomes deserve to be explored in future studies.

ACKNOWLEDGEMENTS

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Semantic Extensions of Hausa Visual and Auditory Perception Verbs *gani* and *ji* in Romance Fiction

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ABSTRACT

This study focuses on the metaphorical semantic extension of Hausa visual and auditory perception verbs as portrayed in romance fiction. Hausa language, just like any other language, provides a window into how speakers use language to make sense of the world around them. The study examines how language users attribute abstract concepts, such as thinking and understanding, to sensory experiences of seeing and hearing, drawing on the conceptual metaphor theory. The study analysed a corpus of Hausa romance fiction, focusing on the use of perception verbs and the metaphorical extensions they evoke. A qualitative research approach was employed, and literary texts were selected as the primary data source. The text data were extracted using the AntConc programme, and such data were then analysed using a cognitive semantics analytical framework. The study's findings indicated that verbs of higher intellect, such as "understand" and "think", are derived from hearing and vision, respectively. These metaphorical extensions are closely related to cultural beliefs and norms, emphasising the importance of visual and auditory cues in human relationships. This article provides insights into how language and culture intersect in using perception verbs in Hausa romance fiction texts and demonstrates the importance of understanding metaphorical extensions in studying language and culture.

Keywords: Metaphor, perception verbs, prototypical meaning, semantic extension, trans-field

INTRODUCTION

Perception verbs such as *see*, *hear*, *touch*, *taste,* and *smell* are used significantly in fiction writing to create the effect of immediate sensory experience. They create an internal viewpoint that reflects various levels of the reader's psyche, creating various layers of meaning to achieve a specific objective. Many recent studies in semantic change have suggested that perception verbs have a polysemous structure. It implies that in addition to their prototypical meanings, perception verbs have extended meanings, otherwise known as semantic extensions, which could be either physical or abstract, with the latter being primarily metaphorical.

According to Roque et al. (2018), perceptual language is a rich source of polysemous meanings and semantic extensions. Only verbs referring to non-contact perception, such as "vision" and "hearing", were found to exhibit any extension to the cognitive domain (e.g., Evans & Wilkins, 2000; Ya'u et al., 2021). These verbs of perception are primarily mapped onto domains of cognitive experience. In accordance with the semantic roles of their subjects, perception verbs are also divided into three categories: copulative verbs, experience verbs, and activity verbs (Viberg, 1983). Experience verbs such as "see" and "hear" are more polysemous than active or copulative verbs (Manasia, 2016). Moreover, lexical items that are deemed polysemous have more than one meaning. Examination of perception verbs has revealed that they have non-prototypical

meanings, which are all extended meanings, in addition to prototypical meanings, which are the original meanings from which all other meanings can be derived (Manasia, 2016; Neagu, 2013), as illustrated by Example 1:

Example 1. I *see* many books on the shelf.

The meaning of the vision verb *see* in the preceding example is prototypical since it conveys the meaning related to a common bodily experience of seeing. However, it has other meanings, known as extended ones, in addition to the literal or prototypical meaning.

The semantic extensions of perception, or meaning extensions, can be trans-field or intra-field. Trans-field extensions occur when one domain of experience is transferred to another, as opposed to intra-field extensions, which take place within the perception verbs (sensory modalities) themselves. The focus of the current study is on the former. Such extensions can be either physical or abstract (Ibarretxe-Antuñano, 1999, 2002; Li, 2013), as shown in Examples 2 and 3:

Example 2. I want to *see* you at home today.

Example 2 illustrates a non-prototypical meaning with a physical meaning extension. In this context, the word *see* refers to "meet", which is a physical activity. Example 3, on the other hand, illustrates a non-prototypical but abstract meaning extension in which the literal meaning of the verb *see*, as illustrated previously, has been extended to the meaning "understand".

Example 3. I do not see why you cannot do it.

As in Example 3, the abstract extension is usually metaphorical since it is systematically conceived in terms of another (physical) experience. It suggests that semantic extension may be physical or metaphorical. This paper, however, is limited to examining metaphorical extensions of Hausa visual and auditory perception verbs of experience (*gani* and *ji*).

Similar to other natural languages of the world, Hausa, a tonal language belonging to West Chadic and the lingua franca of not only Nigeria but also the entire West Africa (Almajir, 2010), has five perception verbs, with one for each sensory modality. However, Hausa has the verb *gani* (see) and only one verb *ji* to designate 'hear,' 'touch', 'taste', and 'smell' because each of these five human senses is perceived in relation to the respective five senses organs, such as the eyes, ears, tongue, nose and skin. In addition, the verb *ji* also denotes 'feeling' things in an intuitive or emotional sense (Ritchie, 1991). For this reason, some linguists have described Hausa as having two perception verbs: vision and non-vision. In other words, Hausa has a monomodal sense (sight) and a multimodal sense (*ji*-complex). In this regard, Ritchie (1991) asserts that because the same verb, *ji*, denotes *thinking and feeli*ng, there is a fusion of the faculties in Hausa that is thought to operate together. However, it is imperative to note that the claim that Hausa recognises only two senses remains unjustifiable, which this article will not address. Nonetheless, it must be stated that the fact that a language has a particular verb to designate many senses does not mean such senses are not recognised. Only the context of use determines which type is in operation.

Problem Statement

Sense perception has become an increasingly important topic in cognitive semantics. Since the wake of Sweetser's (1990) groundbreaking research, sense perception has sparked the attention of many researchers not merely in the field of linguistics but also other academic disciplines, namely, psychology (e.g., Goldstein, 2010), physiology (e.g., Matthen, 2015; Rouby et al., 2002) and anthropology (Howes, 1991; Majid & Levinson, 2011). Since the conceptual domain of sensory perception and its conceptual structure are reasonably productive and motivate a variety of conceptual metaphors, they have gained growing attention in the field of cognitive semantics.

Besides the matter above, the issue of the universality or cultural specificity of perception metaphors has also been a concern in many cognitive linguistic studies (e.g., Evans & Wilkins, 2000; Ibarretxe-Antuñano, 2008; Neagu, 2013; Roque et al., 2018). The concern is to determine whether the metaphorical extensions of perception verbs are universal, i.e., shared across all languages and cultures, or if they vary significantly across different linguistic and cultural contexts. While some metaphors may appear universally understood due to their prevalence and similarity across languages, other may be deeply rooted in specific cultural experiences, making

them challenging to comprehend outside those contexts. Related to this, some cognitive linguistic researchers asserted that verbs expressing higher intellect, such as understand, know, and think, are closely related to verbs of visual perception in terms of semantic extensions and are common to all cultures (e.g., Lakoff & Johnson, 1980; Sweetser, 1990). In contrast, others have challenged this theory by contending that, depending on the individuals' cultural affiliations, verbs of higher intellect can be developed from verbs of auditory perception (e.g., Aikhenvald & Storch, 2013; Evans & Wilkins, 2000). The current study aims to examine Hausa verbs for both visual and auditory perception, *gani* and *ji*, respectively, in Hausa romance fiction to support or refute the claim that verbs of visual perception are connected to intellect and shared across cultural boundaries.

The majority of the evidence supporting the claim above comes from Indo-European languages, and to date, there is very little published research on the subject in Afro-Asiatic languages, especially Hausa, which is the most widely spoken in Africa today, and exceeded only by Arabic and perhaps Swahili (Almajir, 2010; Jaggar & Buba, 2009). Thus, both the visual and auditory perception verbs merit a systematic investigation in Hausa, as recommended by Ibarretxe-Antuñano (2008, 2019), to determine which claim—universality or culture-specificity of metaphor—is likely to be supported by languages other than Indo-European and Australian, as well as the status of vision verbs in relation to higher intellection. Specifically, the present study

examined the perception verbs *gani* (to see) and *ji* (to hear) in Hausa romance fiction to address this aim.

The literature on semantic extensions of perception verbs often focuses on major world languages such as English, Spanish, or Indo-European languages (e.g., Ibarretxe-Antuñano, 1999; Neagu, 2013; Sweetser, 1990), leaving a dearth of research on the Hausa language. This study explored the unique semantic extensions and cultural nuances associated with *gani* and *ji* in the context of romance fiction, focusing on the Hausa language spoken in West Africa. Examining the semantic extensions of these verbs in romance fiction, researchers can better understand how sensory perception verbs contribute to emotional and romantic narratives. Additionally, this study enables us to understand how cultural factors shape the metaphorical use of perception verbs related to romantic experiences in fiction. By bridging the gap between linguistics and literary studies, this study gives us insights into how language and literature interact in metaphorical expressions.

Regarding data sources, corpus-linguistic inquiries into semantic change have obtained data from various sources and employed a wide range of data collection procedures. For instance, previous studies have mainly sourced their linguistic data from survey questionnaires through responses provided by the respondents (e.g., Vanhove, 2008), dictionaries and thesaurus (e.g., Neagu, 2013; Sweetser, 1990), unstructured interviews with native informants and writer's intuition (e.g., Aliero, 2016), and natural face-to-face

conversations (Roque et al., 2015, 2018). This study, however, differs from those of past related studies in that its data were solely extracted from texts of Hausa romance fiction. Based on the aim of the study, the study was guided by the following research questions:

1. What are the metaphorical meanings of Hausa perception verbs *gani* and *ji* in romance fiction?
2. What are the theoretical implications of the Mind-as-Body theory on the meaning extension of the Hausa perception verbs *gani* and *ji*?

Theoretical Framework

The theoretical framework of the present study is situated within the cognitive linguistics tradition. Specifically, the study adopts Sweetser's (1990) Mind-as-Body theory, a cognitive semantics framework, to explain metaphoric polysemous perception verbs. This theory, generated from the Conceptual Metaphor Theory (CMT), is the foundation for data analysis. In this regard, Lakoff and Johnson (1980) have posited that metaphorical expressions reflect underlying cognitive associations between the source and the target domains. They further purported that the mapping between two conceptual structures is an integral part of metaphor. Such mapping is, therefore, a set of correspondences across different domains of experience in conceptual structures (Semino et al., 2018). It refers to the cross-domain mapping of

a comparative source domain to a target domain.

By using terms and concepts from the physical and social world that are more accessible to denote the realms of reasoning, emotion, and conversational structure that are less accessible, Sweetser (1990) suggests a semantic link-up to explain the widespread trend in metaphorical use in the Indo-European languages. In the same vein, Gunnarsdóttir (2013) opined that the human body serves as a basic means of understanding and absorbing the information found in immediate environments, but it also makes use of a variety of senses which enable us to view the world in a variety of ways. As such, Sweetser (1990) was particularly interested in describing the semantic extensions of passive perception verbs (Manasia, 2016). She stressed that perception verbs manifest a series of extended metaphorical meanings related to cognition, internal feeling, and emotion. After examining perception verbs in numerous Indo-European languages, Sweetser (1990) made the generalisations that visual verbs are extended to denote "knowledge", auditory verbs are extended to denote "internal receptivity or obedience", and tactile verbs are connected to "feelings". Moreover, she argued that while verbs of *taste* are linked with people's internal selves, representing human's "personal likes and dislikes", verbs of *smell* represent "dislikeable feelings". Sweetser's metaphorical mappings for English perception verbs can be represented in Figure 1.

VISION	→→	KNOWLEDGE		
HEARING	→→	HEED	→→	OBEY
TOUCH	→→	FEELINGS		
TASTE	→→	LIKES/DISLIKES		
SMELL	→→	DISLIKEABLE FEELINGS		

Figure 1. Semantic extension perception

In view of the above discussion, it must be stated that the metaphorical semantic extensions of perception verbs could be examined in the light of the Conceptual Metaphor Theory (CMT) proposed by Lakoff and Johnson (1980). Accordingly, the metaphorical semantic extensions of perception verbs in Hausa fiction writings can be approached using the CMT, which posits that understanding abstract concepts is based on people's embodied experiences in the physical world. As shown in Figure 2, metaphor is driven by correspondences between the people's external experience, the source domain, and their internal emotional and cognitive states, the target domain. The theory provides insights into how the meanings of visual and auditory perception verbs are extended via mapping them onto other domains of experience. In this way, the metaphorical use of these verbs can reveal cultural, social, and historical factors that motivate language use and perception in Hausa romance fiction. In other words, the CMT could account for how language communicates meanings in Hausa fiction writings. In line with this, it is noteworthy that metaphor involves conceptualising a particular experience, the mind, in terms of another, the body (Neagu, 2013).
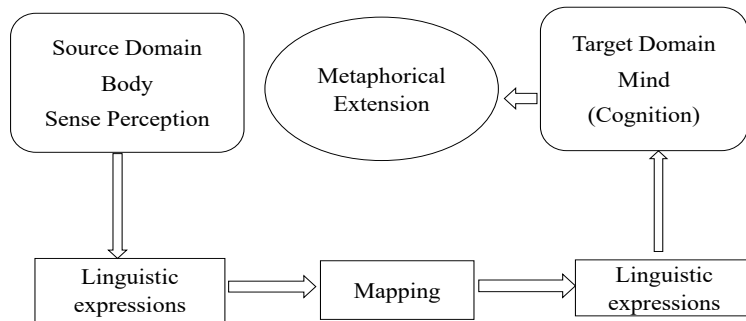

Figure 2. Theoretical framework

RELATED LITERATURE

Polysemy and Verbs of Sensory Perception

It is essential first to define polysemy because the perception verb is a typical example of polysemy. In light of this, the linguistic environment in which a word contains two or more related meanings is, thus, referred to as polysemy in semantic analysis (Ibarretxe-Antuñano, 1999).

Research on polysemy, a common linguistic behaviour used by all people daily, spans both the meaning structure and language processing domains (e.g., Collins & Loftus, 1975; Sweetser, 1990). These features have elevated polysemy to a central topic of study and drawn interest from the fields of computational, cognitive, and psycholinguistic linguistics (Steen & Gibbs, 1999). The lexical meaning ambiguity in polysemous words triggers the focus on polysemy. In the same vein, a number of recent studies in the field of cognitive semantics (e.g., Ibarretxe-Antuñano, 2019; Leon, 2021; Manasia, 2016; Neagu, 2013) have revealed various semantic extensions of perception verbs due to their structurally polysemous nature.

The semantic extensions of perception verbs refer to a shift in meaning from a literal and concrete to a more logical and abstract meaning, which is mostly metaphorical (Sweetser, 1990; Vanhove, 2008; Yu, 2008). Related to this, Raffaelli and Kerovec (2017) emphasised using conceptual metaphors to account for how meaning extends from the source to the target domain in cognitive linguistic studies. Accordingly, conceptual metaphor helps us see how the senses of words with multiple meanings are related, for everyday cognition is metaphorically constructed (Lakoff & Johnson, 2003). Since conceptual metaphor is among the cognitive tools that frame this spectrum of meanings, it is ubiquitous in everyday language (Lakoff & Johnson, 1980; Manasia, 2016), influencing how people use language, think, and act.

The association between the domain of 'perception' and other domains of experience, such as 'cognition' was first introduced in the seminal work of Lakoff and Johnson (1980), where the notion of conceptual metaphor was derived. They argued that abstract concepts, such as understanding, are often conceptualised in terms of concrete perceptual experiences. Approximately a decade later, using Lakoff and Johnson's conceptual metaphor as a point of departure for studying English perception verbs, Sweetser (1990) discovered the metaphorical mappings amongst the vocabulary of internal self and sensation, which serve as the target domain and the vocabulary of physical experiences as the source domain. In other words, she found a logical network of metaphorical connections between the physical realms of the five senses and other comparable abstract domains of experience. Theoretically, mental existence's objective, intellectual side appears frequently related to the sense of "vision". According to Sweetser (1990), it would be unusual for a verb whose literal meaning is "hear" to change to imply "know" instead of "understand". Other Indo-European studies, such as those by Ibarretxe-Antuñano (1999, 2002) and Neagu (2013), provided evidence to support Sweetser's theory.

However, the findings of some comparable studies on non-Indo-European languages tend to be inconsistent (i.e., not in line with Sweetser's hypothesis). Evans and Wilkins (2000) carried out the most noteworthy study, which examined

60 Australian Aboriginal languages. They found that most languages supported auditory rather than visual perception verbs, Sweetser (1990) asserted, indicating culture-specificity. The study further revealed that visual perception verbs are connected to 'lust', 'desire', 'offence', and 'supervision' instead. The body of research has shown that only non-contact sensory verbs like "seeing" and "hearing" have been demonstrated by cognitive semantics to extend to cognitive readings; therefore, these contradictory findings are not unexpected (e.g., Evans & Wilkins, 2000; Ya'u et al., 2021). Hence, this study examines the polysemy occurring in the semantic field of visual and auditory perception verbs in Hausa.

Metaphorical Motivation of the Semantic Extensions of Perception Verbs

In cognitive semantics, the concept of motivated language involves embodiment, which is a concept that encompasses both physical sensorimotor and socio-cultural grounded experiences (Ibarretxe-Antuñano, 2013b). Dirven and Pörings (2003) highlight that in cognitive linguistics, the theory of metaphor is revolutionary, for it is closely connected to two broad assertions: (i) the experientialist, bodily basis of metaphor, and (ii) the universalist basis for conceptual metaphors. Metaphorical analysis should consider bodily-based and cultural elements, as the body and culture interact when constructing the experiential basis of metaphors. The human body plays a vital role in creating meaning and understanding;

the embodiment and physical and cultural worlds must delineate what is meaningful to people.

Some researchers argue that humans share common embodied experiences, and different languages should have similar conceptual metaphors (Yu, 2004, 2008). In her comparative study of body-part terminologies of Chinese and English, Yu (2008) discovered that the terms for 'face' in both languages have processed figurative meanings in similar ways. However, some researchers have argued that the role of socio-cultural traits should not be overlooked when it comes to metaphor grounding, as the way people use bodily experience may differ tolerably. Metaphorical correspondence between source and target domains occurs due to the interplay between body and culture. Thus, cultural models play an interpretive function in observing the human body and its role in metaphor grounding. In this manner, some cultures or languages can select different organs of the body or embodied experiences to map onto the same abstract concepts (Blake & Sekuler, 2005; Ibarretxe-Antuñano, 2013a, 2019). Therefore, the interaction between universal embodied experiences and different cultural experiences reveals the magnitude to which conceptual metaphors are universal, widespread, or culture-specific.

Verbs of Sensory Perception in Fiction Writing

The semantic field of perception verbs has become an increasingly important topic of study in fiction writing. Various books

on the literary genre have indicated that perception verbs are mainly employed in fiction to portray a realistic atmosphere in literary works. According to Semino (2008), fiction is a fertile ground for exploring and discovering new things about the metaphorical nature of perception verbs. It means that such verbs are not merely utilised to create a new world but also to make readers perceive a storyline from a character's perspective. Related to this is the reference to the Western folk model of the 'five senses'— vision, audition, smell, taste, and touch which has been commonly utilised in the study of perception verbs (Geurts, 2002). This model of sensory perception conceptualises the sense organs, namely, eyes, ears, nose, mouth, and hands, as an internal viewpoint to reflect various levels of a character's psyche. Moreover, as stated earlier, sensory verbs such as see, hear and feel have been used by narrators in literary works to portray certain characters as perceived objects (Farner, 2014).

Sensation plays a vital role in making the reader experience and live the events so that he or she can see, hear, smell, feel, and taste the external world as a story unfolds, one of the modes of fiction writing (Klaassen, 2015). Sensation establishes vivid descriptions of a character in a way that brings action to life. It can also stimulate recollection, which may help in depicting the experiences of a character or the circumstances of an event that occurred prior to the action in a literary work. Utilisation of sensory perception in literary works of art can be an effective mechanism

for developing a character, especially in relation to emotional responses to certain stimuli. For instance, in Patrick Süskind's *Perfume,* the main character's extraordinary sense of smell is depicted through visual metaphors (Popova, 2003).

METHODOLOGY

This study is qualitative, specifically employing a descriptive and interpretive qualitative approach. The study utilised data comprising Hausa linguistic expressions pertaining to perception verbs, particularly visual and auditory verbs used in romance fiction writings. The data were extracted from four Hausa novels selected as the data sources, for they provide rich sources of the required data. The abundant occurrences of the perception verbs in the novels enabled the researcher to examine how the Hausa perception verbs *gani* and *ji* occur and behave in various linguistic situations metaphorically or via different semantic extensions (Deignan, 2005; Weisser, 2016).

Criteria for the Selection of Novels

The study used inclusion-exclusion criteria in selecting the novels to be included. Firstly, the novels selected should belong to the romance genre, as it is known for its emphasis on emotional relationships, sensory descriptions, and themes of love and desire. Secondly, Hausa authors should write the novels to represent the cultural context in which Hausa language and perception verbs *gani* and *ji* capture the nuances and cultural-specific expressions. Thirdly, only

novels that showcase a variety of linguistic expressions and usage of *gani* and *ji* were selected to ensure that the data represents the full range of metaphorical extensions and usage of the perception verbs, which, in turn, provide a richer dataset for analysis. Finally, the period for the selection of novels is another criterion. Specifically, the selected novels were written between 2010 and 2020 to avoid any potential changes or evolution in romance fiction's metaphorical extensions of *gani* and *ji* within a short decade. Based on these criteria, the researchers could ascertain that the selected novels provide a representative and diverse dataset that captures the metaphorical extensions of *gani* and *ji* within the context of romance fiction.

As for sample size, four novels were considered a reasonable sample size, taking into account the scope and depth of the study and its required analysis to answer the research questions. In this regard, several studies on metaphor have addressed linguistic analysis in the context of literary texts with comparable or smaller sample sizes. Such studies have achieved meaningful insights and valuable conclusions, thereby supporting the feasibility of a sample size of four novels (Dagnev & Chervenkova, 2020; Msuya, 2016). Such studies have demonstrated that valid conclusions could still be drawn from a small sample for those within the qualitative paradigm. Utilising a small yet meaningful sample of texts has enabled researchers to reveal notable patterns related to underlying metaphorical linguistic expressions in the writing style of selected authors.

Table 1 provides an overview of the novels used in the corpus of the study, their respective authors, word counts, and the percentage they contribute to the overall dataset. Each novel was carefully chosen to comprehensively depict the metaphorical usage of *gani* and *ji* in romance fiction.

Table 1
Novels used in the corpus

No.	Novel	Author	Word counts	Percentage (%)
1	*Yaƙin So*	Jamila Isa Fagge	50323	23.2
2	*Rabon Kwado*	Hajiya Hafsat Sodangi	46962	21.6
3	*So ɗaya tak*	Amina Yusuf Magashi	54764	25.2
4	*Abun Sirrine*	Sadiya Abdullah Shehu	65102	30.0
Total	4	4	217156	100

Data Collection

To gather the necessary data, PDF texts of the novels were converted into plain text format using an online PDF-to-text converter. The resulting plain text files were cleaned to remove irrelevant characters, such as page numbers, headings, and other extraneous information that may interfere with the analysis process. Such plain text files were then imported into the AntConc

3.5.7 programme. In order to identify their metaphoricity while taking into account their co-text and track their frequency of occurrences, different morphological forms of each of the two verbs, *gani*, *ganin*, *ga* (for *gani*), and *ji*, *jin* (for *ji*), were keyed in separately into the software. The text data were then retrieved using a concordancing tool in the AntConc 3.5.7 programme. The data are presented as Key Word in Context (KWC), where the verb *gani* or *ji* is displayed in the centre of a page and is bordered by co-text. By examining the concordance results, the study analysed the contextual usage of *ji* and *gani*, paying close attention to any metaphorical extensions or usages within the romance fiction texts. This analysis involved the identification of patterns, collocations, and recurring themes associated with the metaphorical extensions of the visual and auditory verbs. The concordance results provide relevant examples illustrating the metaphorical extensions manifest in *gani* and *ji* in the texts. The extracted examples were later subjected to further evaluation to identify and interpret the specific semantic extensions of *gani* and *ji*. They also considered patterns, metaphoric mappings, and cultural influences contributing to their metaphorical use in the novels.

Data Analysis

As highlighted earlier, the concordance lines and surrounding context were analysed to identify the semantic extensions of *ji* and *gani* within the romance novels. Instances where these verbs are metaphorically used to express abstract concepts, emotions, or cognitive processes to reflect the associated meanings conveyed by these semantic extensions, were identified and analysed. The Pragglejaz Group's (2007) Metaphor Identification Procedure (MIP) was used to assess the metaphoricity of the Hausa sentences containing the verbs and decode the metaphorical overtones that the Hausa verbs *gani* and *ji* exhibit in their semantic extensions. The Hausa expressions were first translated into English before the identification of the metaphors in the novels. Numerous monolingual and bilingual dictionaries were used to decode the literal meanings of the metaphorical expressions involving Hausa verbs for visual and auditory perceptions to ensure their accuracy for the identification process.

Using the MIP involved four successive steps as follows:

    i. Reading the entire text (in this case, the sentence/phrase that contains the investigated perception verbs) to create a general understanding of the topic,

   ii. Determining the contextual meaning of visual or auditory verbs while taking into consideration their co-text,

  iii. Verifying whether the verb has a more literal meaning in another context than in a given context; and if yes, decide whether the meaning in context differs from the literal meaning but is comprehensible in comparison with it, and

iv. Deciding on whether the verb manifests a metaphorical semantic extension; if the contextual meaning of the verb can be understood compared to its literal meaning, such verb is, therefore, metaphorical.

The frequency of their occurrences was presented, having identified metaphorical uses of these perception verbs. Illustrative examples of linguistic expressions were also given, extracted from the corpus to illustrate the different extension types. The Mind-as-Body analytical framework proposed by Sweetser (1990), which depicts a systematic connection between bodily perception and the mind's abstract realm, was used for data analysis.

RESULTS
Analyses of Metaphorical Extension of Hausa Verb *Gani* and *Ji*

The transference of two entities, qualities, or processes through a correlation, in addition to assigning one's attributes to the other, is known as metaphorical semantic extension. This process allows us to understand one thing in terms of another. A word, phrase, or sentence's metaphorical extension depicts what a speaker might use it to mean in contrast to what it actually signifies (Searle, 1978). Hence, the relation between the sentence meaning and the metaphorical meaning of utterances is not arbitrary but systematic. The knowledge allows people to understand and use metaphorical utterances that surpass the knowledge of the literal meaning of words and sentences (Almajir, 2010). For the analysis presentation, each

example of Hausa linguistic expressions manifesting the different metaphorical extensions is accompanied by a literal back translation into English, its literal meaning and the actual meaning of the expression.

The Vision Verb *Gani* (See)

The Hausa perception verb *gani* encodes 'activity of seeing' animate and inanimate objects with physical eyes. The metaphorical expressions underlying Hausa visual verbs manifest different metaphorical semantic extensions. For example, the results of visual perception verbs revealed three main groups of metaphorical extensions, such as the extension to intellect and a mental activity, extension to reliability and assurance, and extension to a miscellany of human experiences, in which each group has a number of specific metaphorical extensions as shown in Table 2.

Table 2
Metaphorical extensions of Hausa vision verb gani *(see)*

Metaphorical extension	Frequency
Extension to intellect and mental activity	76
- to consider/think	65
- to visualise/imagine	7
- to foresee	4
Extension to reliability and assurance	66
- to make sure/ensure	43
- to find out	18
- to take care	5
Extensions to miscellany of human experiences	17
- to witness/experience	14
- to support	3
Total	159

As shown in Table 1, the data analysis revealed 159 instances of non-prototypical or extended metaphorical meanings. Specifically, eight metaphorical semantic extensions of the verb *gani* were identified. The most frequent of them is the semantic extension "to think about/consider" with 65 tokens, followed by "to make sure/ensure" with 43 tokens, and the least frequent is "to support" with only 3 tokens.

Metaphorical Extension of The Verb *Gani* to "Consider/Think"

This meaning extension deals with the ability to judge a particular thing in a particular way or form an opinion about something (Ibarretxe-Antuñano, 2002). In Hausa, the metaphorical extension of the verb *gani* is mainly used to share personal opinion, as can be instantiated in Example 4:

Example 4	*Kina*	*ganin*	*Dr Bilal*	*ba zai*	*tona mana asiri*	*ba?*
	2SG-IMPFV.	see	Dr Bilal	3MSG.FUT.	dig our secret	NEG.

[Do you *see* Dr Bilal will reveal our secret?] (literal meaning)

Do you *think* Dr Bilal will not reveal our secret?

Metaphorical Extension of the Verb *Gani* to "Visualise/Imagine"

Besides the meaning "to consider/think", the verb *gani* undergoes a change in meaning from denoting physical activity of seeing to abstract mental experiences such as imagining. When someone visualises something, he or she imagines something unreal or non-existent, which was only created in his or her mind. In this regard, Ibarretxe-Antuñano (2002) highlights that people visualise counterfactual situations that have already taken place or may occur at some point. This extended meaning is manifested in the following metaphorical expression in Example 5:

Example 5	*Yana*	*tuna*	*fuskoki-n*	*mutanen da ya*	*gani*	*a cikin mafarkin-sa*
	3MSG.IMPFV	remember	faces.of.	people 3MSG.PFV.	see	in dream.of. 3MSG

[He thinks about faces of people he saw inside his dream] (literal meaning)

He remembers the images of people's faces he *imagined* in his dreams.

Metaphorical Extension of the Verb *Gani* to "Foresee"

The verb *gani* may also metaphorically be realised as 'foresee'. Example 6 demonstrates that the source domain *gani* has its corresponding target domain, 'foresee', as the metaphorical element. In this example, the verb *gani* is not used literally as an act of physical seeing with eyes but metaphorically to mean 'foresee'. Thus, the speaker in the novel (novel 3) considers Mardiyya, a little girl who cannot

foresee or predict future events. In such a case, the metaphorical extension denotes the meaning of predicting and imagining future happenings, which has to do with the mind's eyes (Ibarretxe-Antuñano, 1999).

Example 6	*Mardiyya,*	*ke*	*yarinya*	*ce*	*baza ki*	*ga*	*muhimmanci-n*	*magana ta ba*
	Mardiyya	2SG	girl	STAB.	FUT.3FSG	see	importance.of	talk.of.1SG NEG.

[Mardiyya, you are a girl you cannot see the importance of my talk] (literal meaning)

Mardiyya, you're still young, and you cannot *foresee* the importance of my words.

Metaphorical Extension of the Verb *Gani* to "Make Sure/Ensure"

Another metaphorical extension of *gani* is to "make sure/ensure". The verb *gani* is not used in its literal sense but metaphorically, as it carries the meaning 'to make sure' (Example 7). As such, a task is usually given to someone asked to observe the process and ensure it is done correctly (Jumaah et al., 2020).

Example 7	*Suna,*	*ƙokari-n*	*ganin*	sun	ceto	ran-ta
	3PL.IMPFV	try.of	see	3PL.PFV	3PL.PFV	life.of. 3FSG

[They are trying to see they rescue her life] (literal meaning)

They are trying to *make sure* that her life is saved.

Metaphorical Extension of the Verb *Gani* to "Find Out"

Another metaphorical usage of the verb *ga* (another form of gani) involves its extension to indicate a process of becoming aware of something or happening. The semantic change of the verb *gani* from concrete to abstract indicates metaphorical uses. Thus, the vision verb *gani* in Example 8 is used metaphorically to mean to 'find out', as the speaker in the novel (novel 4) decided to send his daughter to Gwaggo to find out if she could stay with her, as instantiated in the following example:

Example 8	*Bari*	*na kai ta*	*wurin Gwaggwo*	*na ga*	*ko za ta yarda*	*ta zauna*
	Allow	1SG send 3FSG	place.of. Gwaggwo	to see	if she can agree	to sit

[Let me to take her to see if she can agree to sit] (literal meaning)

Let me take her to Gwaggwo to *find out* if she will stay with her.

Metaphorical Extension of the Verb *Gani* to "Take Care"

The Hausa verb *gani* can also undergo a metaphorical extension to mean 'take care' whereby the agent (animate subject) is given the command to look after an object, as exemplified in the linguistic expression (Example 9):

Example 9   *Don Allah*   *gane min*   *jakar nan*   *inaso*   *zan zagaya*

           For-the-sake.of. Allah   see 1SG-POSS   bag this   1SG.want   1SG.FUT round

           Because of Allah, see for me this briefcase I want to go round (literal meaning)

           For the sake of Allah, keep an eye on this briefcase for me. I want to ease myself.

Metaphorical Extension of the Verb *Gani* to "Witness/Experience"

In addition, the verb *gani* undergoes a semantic shift from its original meaning of the physical activity of seeing to the abstract activity of witnessing, which is metaphorically extended to mean 'witness or experience'. It is similar to the verb *ga* in Example 10, which is used metaphorically to denote 'to witness', since the novel speaker asks a rhetorical question: "If he or she witnessed that day, how happier would he be?"

Example 10   In na <u>ga</u>   wannan rana-r   wane irin   farin-ciki zan yi?

            If 1SG.PFV see   this day-DET   which colour.of   happiness 1SG.FUT. do

            [If I saw that day, which happiness I would do?] (literal meaning)

            For the sake of Allah, keep an eye on this briefcase for me. I want to ease myself.

Metaphorical Extension of *Gani* to "Support"

In Example 11, the vision verb *ganin* (another related form of *gani*) in this context is used metaphorically to mean 'to support.' In novel 1, the speaker used the word to indicate his/her support of one of the characters, Garba's suggestions. After some consideration, the speaker was convinced by his argument and decided to support it, as manifested in the following expression.

Example 11   *Ni kam*   *har yanzu*   *na fi <u>ganin</u>*   *shawara-r Garba*

            1SG. PART.   CONJ. now   1SG. COMP. see   suggestion.of. Garba

            For me, still I *see* more suggestions of Garba (literal meaning)

            I am still in *support* of Garba's suggestions.

The Auditory Verb *Ji* (Hear)

The Hausa's auditory verb *ji* is the sense of linguistic communication involving sound perception. In communicative interaction, two players are involved: the speaker and the hearer, which, in turn, create mental or cognitive perceptions among the interlocutors. In this light, the verb *ji* has a literal sense of 'to hear' sound. The verb manifests a metaphorical mapping between the physical, experiential domain, the source, and that of the abstract experiential domain, the target, which results in a gamut of metaphoric meanings (Table 3).

Table 3
Metaphorical extensions of Hausa auditory verb ji *(hear)*

Metaphorical extensions	Frequency
to understand/know	24
to pay attention	18
to be told/informed	38
to obey	15
to find out	7
Total	102

The data analysis revealed five different kinds of metaphorical semantic extensions underlying the Hausa verb *ji* (Table 2)*.* These extensions constitute 102 occurrences. The analysed data indicated that the metaphorical extension of the verb *ji*, which means "to be told", was the most common, with a frequency of 38 times, followed by the extension "to understand", occurring 24 times. The less common extension is "to find out", with a frequency of seven times.

Metaphorical Extension of the Verb *Ji* To "Understand/Know"

Although the Hausa perception verb *ji*

has a basic sense of the physical activity of hearing with one's ears, it is associated with mental activity or cognition. It has a metaphorical sense denoting 'understanding' or 'knowledge,' as can be illustrated in the metaphorical connotations in Example 12. This finding aligns with the previous study on Hausa's sensory perception. As Ritchie's finding (1991) highlighted, the Hausa verb *ji* 'hear' can mean 'to understand'. In contrast, the word *gani*, 'to see', is never used to understand what a person means.

Example 12	*Bai yi*	*kama da*	*mai jin*	*Hausa ba*
	3MSG.NEG.	similar with	MOD. hear	Hausa NEG.
	[He does not look like someone who hears Hausa] (literal meaning)			
	He does not look like someone who *understands* Hausa.			

Metaphorical Extension of the Verb *Ji* to "Pay Attention"

The verb *ji* may also be realised metaphorically, denoting 'to pay attention'. Example 13 below illustrates the source domain of the vision verb *ji*, i.e., physical activity of hearing, which

has its corresponding target domain, the abstract activity of paying attention, as the metaphorical elements. In this case, when a speaker utters such words in a sentence, he or she is not simply asking the hearer to hear him or her. By implication, he or she requests the listener to pay attention

to understand the speaker. This meaning extension is also related to knowledge, for the hearer has to pay attention if he/she has to understand the speaker's message.

Example 13 *Duk   magana-r nan da   suke yi   bata <u>jin</u>-su   sai lazimi take yi*
DET (all)   talk.of. that REL   3PL.IMPFV. do   3FSG hear NEG   3PL prayer IMPFV.do
[Every talk they were doing she didn't hear them] (literal meaning)
She didn't *pay attention* to whatever they were discussing as she was busy praying.

Metaphorical Extension of the Verb *Ji* to "Be Told/Informed"

Besides the aforementioned metaphorical extensions, the auditory verb *ji* may have a metaphorical extended meaning that denotes 'to be told or informed when used in a context'. When the verb *ji* is used in such a situation, it can be inferentially perceived as 'to know', as speakers do not simply say that they heard someone say something but rather infer that they know something, albeit second-hand information. This extension type is instantiated in the metaphorical connotation in the linguistic expression (Example 14).

Example 14 *Mun   ji labari   mutane   da yawa   sun mutu   A wannan haɗari-n*
1PL.PFV. hear story   people   many   3PL.PFV.die   in that accident-DET
[We heard a story many people died in that accident] (literal meaning)
We were told that many people died in such accident.

Metaphorical Extension of the Verb *Ji* to "Obey"

Another metaphorical extension usage of the verb *ji* is 'to obey'. In this case, it must be pointed out that the verb *ji* does not mean 'to obey,' but the context of use makes the hearer realise its semantic shift. This metaphorical extension is manifested in Example 15:

Example 15 *Yaro ne   mai   rashin ji*
Boy STAB.   MOD.COMP.   NEG. hear
[The boy with no hearing] (literal meaning)
He is a disobedient boy.

Metaphorical Extension of the Verb *Ji* to "Find Out"

This metaphorical semantic extension is uniquely peculiar to Hausa, whereby both verbs *ji* and *gani* can extend their meaning to 'to find out' depending on the context of the situation. In Example 16, the speaker is determined to visit her parents to find out if they intend to end their love relationship.

Example 16 *Zan   je   gidan   na ji   ko dai iyaye-n ta ke son raba mu*
1SG. FUT. go house-DET.   1SG hear   if parents.of. 3FSG want separate 3PL
[I will go house and hear if her parents want to separate us] (literal meaning)
I'll visit her house to *find out* if her parents want to separate us.

DISCUSSION

Expanding upon the metaphorical extensions of the Hausa perception verbs *gani* and *ji*, which were previously identified and discussed in this paper, delving into the theoretical ramifications of the Mind-as-Body theory can offer valuable insights into how cognitive processes and cultural experiences shape the utilisation of these perception verbs. This exploration can be framed within embodied cognition, conceptual metaphors, and cultural influence.

In terms of embodied cognition, the Mind-as-Body theory suggests that people's understanding of abstract concepts is grounded in bodily experiences. By applying this theory to the meaning extension of *gani* and *ji*, it becomes evident that these perception verbs have metaphorically extended to represent mental states and cognitive processes. For example, the verb *gani,* which means "to see" in its literal sense, could be metaphorically used to express considering, foreseeing or visualising. Similarly, the verb *ji*, meaning "to hear" literally, might metaphorically convey the meaning of understanding or knowing something.

Moving on to the conceptual metaphor aspect, the Mind-as-Body theory emphasises the role of conceptual metaphors in understanding abstract concepts. In the case

of *gani* and *ji*, the metaphorical extensions rely on conceptual mappings between sensory perception and mental processes. The metaphorical uses of *gani* and *ji* could involve conceptual metaphors, such as "considering is seeing" or "understanding/knowing is hearing". By employing these conceptual mappings, individuals are able to express complex cognitive experiences by relating them to more concrete sensory experiences.

Lastly, the Mind-as-Body theory recognises the influence of cultural experiences and practices on metaphorical mappings. In the specific context of the Hausa perception verbs *gani* and *ji*, the cultural context and practices of the Hausa community play a significant role in shaping the metaphorical extensions of these verbs. Cultural beliefs, values, and practices related to seeing, hearing, and understanding contribute to the metaphorical use of gani and ji. Exploring these cultural influences provides insights into how specific cultural contexts shape metaphorical extensions.

This study revealed that using visual and auditory perception verbs in Hausa romance fiction is associated with intricate metaphorical extensions, reflecting a strong cultural and emotional resonance. The metaphorical extensions mirror Hausa's culture and traditions, conveying complex emotional, cultural, and social issues. The

study's findings suggest the importance of attending to the metaphorical meanings of perception verbs when analysing language use in a specific context. Properly considering metaphorical meanings, particularly those associated with perception verbs like "gani" and "ji" in Hausa, will significantly enhance the comprehension of language, culture, and cognitive processes. In particular, these findings revealed how the physical domains of the Hausa mentioned above perception verbs are mapped onto the mental domain, resulting in several metaphorical extensions. The findings also suggest that the Hausa verb *gani* can have meaning extensions that are associated with abstract experience, such as "to think", "to consider", and "to foresee". These extended meanings are connected to intellect and mental activity, which are cognitive domains. The fact that both the verbs *gani* and *ji* develop metaphorical extensions that mean "to find out" is an interesting finding of this study.

In addition, conceptual metaphors are essential in comprehending linguistic metaphors and semantic extensions. Such metaphors map concepts from one domain to another, enabling us to more concretely understand abstract or complex ideas. In this case, while linguistic metaphors use a source domain to evoke a target domain, semantic extensions broaden a word's meaning beyond its original scope. In this regard, conceptual metaphors contribute to semantic extensions by facilitating the extension of meanings of words *gani* and *ji* based on their association with related concepts. This process unfolds via metaphorical mappings, wherein an underlying conceptual metaphor establishes a cognitive connection or conceptual link that expands a word's meaning into novel contexts of domains.

Another striking finding which emerged from this study is that it is the verb of hearing that extends its meaning to knowledge and understanding, which corroborates the findings of some studies on African languages, such as those by Aliero (2016), Ritchie (1991), Gachũgĩ (2018), Van Putten (2020) and Ahmad (2020). These findings may be related to Wober's (1966) 'sensotype' hypothesis, which argued for the pervasiveness and hegemony of the sense of hearing in African culture. According to this finding, however, knowledge and intellect are not always associated with the sense of vision, contrary to Sweetser's hypothesis, which states otherwise.

In contrast to literate Indo-European communities, which prioritise "seeing", this discovery may be explained by the fact that the Hausa community is mostly oral (Ritchie, 1991), with people relying on "hearing" for the acquisition of knowledge and intellect. This finding is consistent with the findings of studies on non-Indo-European languages (Evans & Wilkins, 2000; Vanhove, 2008), which indicated that regularly hearing verbs develop meaning extensions of "know" and "think", thus suggesting culture-specificity of metaphorical extensions of these perception verbs. The current study has provided supporting evidence for the culture-specific nature of cross-domain semantic extensions in perception verbs. The study has unveiled a connection between

auditory perception verbs and cognitive processes, or intellection, as evidenced by the additional meanings associated with the experiential verbs "gani" and "ji", primarily pertaining to cognition.

It suggests that verbs of auditory perception are also associated with objective knowledge and intellection. Specifically, it is found that Hausa derives verbs of higher intellect, such as "understand" from hearing and "think" from vision. These findings suggest that the cultures in which people are embedded influence the semantic extensions of perceptual verbs significantly. The existing evidence strongly suggests the presence of cultural diversity in the trans-field semantic extensions of perceptual verbs. Gaining insight into the metaphorical usage of perception verbs in Hausa romance fiction offers a valuable perspective on the cultural, social and historical forces shaping language within the Hausa community. As a result, this study significantly contributes to a broader comprehension of how metaphorical extensions can unveil cultural perspectives, values and emotions within romance fiction.

CONCLUSION

This study aims to investigate the metaphorical meanings of Hausa perception verbs *gani* and *ji* in romance fiction and examine the Mind-as-Body theory's theoretical implications on the meaning extensions of these verbs. The results shed light on how these verbs undergo metaphorical extensions to convey abstract concepts beyond their literal meanings.

The study found that the verb *gani*, which literally means "to see", is metaphorically extended to represent cognitive processes and experiences. Metaphorical extensions of *gani* encompass meanings associated with intellect and cognitive processes, reliability and assurance, as well as a range of human experiences. Among these extensions, the most frequently observed metaphorical usage was "to think/consider", followed by "to make sure/ensure", with "to support" being the least commonly encountered.

Similarly, the verb *ji*, which literally means "to hear", also exhibited metaphorical extensions which convey abstract meanings. The metaphorical extensions of *ji* encompassed meanings such as "to understand/know", "to pay attention", "to be told/informed", "to obey", and "to find out".

In this study, we also delved into the theoretical implications of the Mind-as-Body theory. The findings revealed that the Mind-as-Body theory offers valuable insights into how cognitive processes and cultural experiences shape the metaphorical extensions of the Hausa verbs *gani* and *ji*. The theory of embodied cognition posits that abstract concepts are rooted in bodily experiences, which may elucidate why these perception verbs are metaphorically extended to represent mental states and processes.

Furthermore, the study suggests that conceptual metaphors, such as "considering is seeing" or "understanding/knowing is hearing", could underlie the metaphorical use of *gani* and *ji*, enabling speakers to convey intricate cognitive experiences

by linking them to tangible sensory experiences. Additionally, the specific metaphorical extensions of these verbs may be influenced by the cultural context and practices of the Hausa community, highlighting the significant role of culture in shaping metaphorical meanings.

The study contributes to cognitive linguistics, metaphor studies, and Hausa language research. Future research could be valuable to gain a more comprehensive understanding of cultural variation in utilising perception verbs. Notably, this study is confined to examining the experiential category of verbs associated with vision and hearing. Thus, there remains potential for further investigations to explore the scope of cultural variation in the usage of perception verbs across different languages, contexts and categories.

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SOCIAL SCIENCES & HUMANITIES

Review Article

Potential of Sense of Place in Cultural Heritage Conservation: A Systematic Review

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ABSTRACT

Sense of place is a fundamental aspect of cultural heritage conservation and management, as it plays an important role in understanding the connection between individuals and the places they inhabit. This study aims to provide heritage managers and scholars with up-to-date insights into the importance of a sense of place in maintaining cultural heritage. The main objectives of this research are to explore whether a sense of place's role in cultural heritage research has been adequately investigated and to assess the sense of place potential in cultural heritage conservation. We conducted a systematic literature review of 42 articles to achieve these goals. Through thematic analysis, this study reveals a sense of place's impact on various aspects of cultural heritage conservation. From the results, six prominent themes emerged, highlighting that a sense of place is a key determinant in the effectiveness of cultural heritage management initiatives. Based on these findings, authors advocate for enhanced collaboration between the government and local communities, acknowledging the importance of heritage tourism and reinforcing policies for cultural heritage conservation to bolster the sense of place. In future research, examining a sense of place can expand to interdisciplinary intersections, quantitative studies, cross-

national comparative research, and the exploration of the role of technology in augmenting both the sense of place and cultural heritage conservation.

Keywords: Conservation, culture heritage, sense of place, systematic review

INTRODUCTION

According to earlier research, residents' emotional, mental, and behavioral experiences are frequently gauged at the community level using sense of place (Ghoomi et al., 2015; Mohammad et al., 2013; Stedman, 2002). Numerous previous studies on topics pertaining to a sense of place and physical space demonstrated the extensive academic interest of researchers in the sense of place. Furthermore, and perhaps significantly, these studies demonstrate a strong correlation between cultural and social characteristics and the prevalence and strength of a feeling of place. Interactions between individuals and places generate a sense of place (Steele, 1981) and are mutually formed by ecological and cultural processes (Ryfield et al., 2019). Thus, knowledge about a place is a multifaceted subjective experience (Jorgensen & Stedman, 2006). Eisenhauer et al. (2000) demonstrated that the meaning of the environment is derived from people's social and cultural experiences. At the same time, it forms the ordinary meaning of culture and provides a reference for constructing a sense of place. Under the circumstances, social and cultural significance is crucial for converting space into place.

However, the framework within which heritage managers operate is increasingly being questioned due to the gap between past and present (Waterton, 2005). Thus, this study systematically reviews related articles to resolve the gap in the literature and comprehensively answers the research question. The sense of place is connected to the concept that certain physical, emotional, and spiritual connections can be made with particular places or places that are typically of personal or cultural significance. This attachment to and familiarity with a place has traditionally been associated with cultural heritage, which refers to the traditional values, customs, and beliefs transmitted across generations within a cultural group. Recently, a growing number of studies have attempted to determine how a sense of place might aid in conserving and promoting cultural heritage. Therefore, the present researchers conducted a review following the PRISMA 2020 Checklist and flow illustration proposed by Page et al. (2021). Using the Scopus, Molecular Diversity Preservation International (MDPI), Taylor and Francis Online, and SAGE databases to search for literature, this study reviews essential findings on the involvement of a sense of place in the management of cultural heritage from different countries and regions to examine the correlation between place and cultural heritage. This study addresses the following research topics: (i) whether the role of sense of place in cultural heritage research has been adequately explored and (ii) the potential of sense of place in cultural heritage conservation.

Simultaneously, this systematic literature review aims to synthesize the current published works on this topic and focuses on the interaction between the sense of place and the conservation and management of cultural heritage. Furthermore, this research tracked the trends and highlighted areas and directions for future research.

Literature Review

Collaboration between individuals and places produces a sense of place (Steele, 1981). Jorgensen and Stedman (2006) viewed it as a self-referential, organizational belief, an emotional and behavioral commitment, a generalized attitude toward the spatial environment, and a complex sociopsychological structure. The capacity to distinguish between many places and identities inside a place is the weakest consequence of a sense of place. Furthermore, over the past 20 years, a considerable number of academic researchers have focused on the sense of place and physical space. For instance, Pretty et al. (2003) employed a sense of place to reveal the attitudes of adolescents and adults toward rural remoteness under economic and sustainability pressures. Rogan et al. (2005) shed light on the changing perceptions and associations about the nature of the biophysical environment. Shamsuddin and Ujang (2008) underlined the value of place attachment in the sense of place to identify special and crucial locations in a particular sociocultural context. Soini et al. (2012) used a sense of place to examine how people and the environment interact along urban-rural boundaries. Ellis and Albrecht (2017) examined how a sense of place in a community is impacted by climate change. Furthermore, Shaykh-Baygloo (2021) broadened the definition of a sense of place to encompass travel locales and concentrated on travelers' perceptions from diverse geographical, historical, social, and cultural backgrounds.

Furthermore, a sense of place is an experience of memory, tradition, history, culture, and society instead of a preset event (Ghoomi et al., 2015). In addition, it considers place relationships and views within their social and geographical contexts (Hay, 1998). Undoubtedly, the sense of place, which unites the user and place, plays a crucial part in the cultural context (Mohammad et al., 2013). Nonetheless, according to Hausmann et al. (2016), one of the greatest underappreciated cultural services is a sense of place while simultaneously demonstrating the importance of integrating place values into conservation decisions. To integrate the other benefits of cultural ecology with a sense of place, Ryfield et al. (2019) used material and socially generated features that can accommodate it.

Cultural identity and heritage are closely attached to a sense of place (Cantillon & Baker, 2022). However, Szymanski and Schofield (2016) recommended that, in the increasingly democratic management of change, sense of place is a strategy and procedure that can be understood, appraised, and considered in heritage practice.

Nevertheless, in heritage conservation practices, the operational tendency continues to prioritize concrete material structures, weakening groups and their sense of place (Lesh, 2020). In addition, Dutson and Convery (2007) reiterated that the idea of a sense of place is a potentially helpful mechanism for framing community sustainability projects and as a viable umbrella term for community heritage/cultural projects. A sense of place and cultural heritage are developed as a result of people interacting with their surroundings (Raatikainen & Barron, 2017). For local people, a sense of place is derived from the physical constraints of a settlement in space and the recognition of the settlement, which considerably enhances its sense of uniqueness and identity (Tuan, 1977). Moreover, da Silva and Pereira (2022) highlighted that meaningful, recognizable, and memorable features in physical spaces can promote a sense of place. Additionally, a sense of place is a symbol that renders a unique place and a characteristic of a certain geographical location that distinguishes it from other places (Parker & Doak, 2014). Alternatively, conserving heritage is essential because it contributes to sustainability, gives a feeling of place, and reflects and strengthens the identity of local communities.

METHODOLOGY

Data Collection and Screening

Systematic reviews, as opposed to other types of reviews, aim to determine the current level of knowledge in an area so that future research objectives can be established (Page et al., 2021). It combines scientific evidence to provide a transparent and duplicable response to a particular research question while considering all available information on the issue and assessing the quality of such data (Lame, 2019). To minimize the risk of selection bias, Nightingale (2009) noted that researchers could establish inclusion and exclusion criteria and employ two or more independent reviewers to assess the inclusion of the studies under review. This process demonstrates systematic reviews' comprehensiveness, transparency, and rigor (Klassen et al., 1998; Weed, 2006).

Therefore, to determine the operational propositions of scholars in related fields on cultural heritage, the researchers conducted a systematic review of papers on the involvement of a sense of place in cultural heritage. The study's main focus was the recommended reporting item checks for systematic reviews and meta-analyses (Moher et al., 2009; Page et al., 2021). The 27 items on the suggested PRISMA 2020 item checklist by Page et al. (2021) were the subject of a systematic study. To prepare a systematic review paper, the researchers conducted a comprehensive literature search for journal articles published up to the end of January 2023.

The researchers created a review methodology to direct the literature search to minimize any bias resulting from post hoc revisions and modifications in the review procedure dependent on the review's goal. Scopus has been recognized as the largest database for abstracts and citations of peer-reviewed literature, with a broad range of

subjects and appropriate quality (Ghani et al., 2022). Additionally, the researchers used MDPI, Taylor & Francis Online, and SAGE individually as additional data sources to obtain more comprehensive literature. Second, the keywords selected for the search for discovering potential studies linked to the topic of interest were "sense of place" AND culture* AND heritage. Third, the researchers targeted articles with search terms in their titles, abstracts, and keywords. Finally, one of the researchers entered the search terms into the aforementioned online databases to screen all previous articles published in English in the social sciences and the arts and humanities. The last search was performed on February 2, 2023. Table 1 outlines the precise procedures for selecting papers for review.

Initially, the researchers identified 408 articles, including 321 articles retrieved from Scopus using TITLE-ABS-KEY. However, the results of content retrieval limited to the title, abstract, and keywords were 0. Therefore, the researchers made appropriate adjustments for the three other databases. Only the pre-determined search terms were checked in the abstract. As a result, the study identified 37 articles from Taylor & Francis Online and seven articles from SAGE. In addition, the study retrieved 43 articles by entering the search terms in the Title/Keyword search bar in MDPI. Following the flowchart shown in Figure 1, 42 of the 408 identified articles were screened for review.

Table 1
Steps and results of the review

| Step	Stage	Criteria/Reasons	Result	
			Included	Excluded
1	Identification	Enter the set search terms in the title, abstract, and keywords	408	–
2	Screening	**Discipline**: Social sciences or humanities and arts **Language**: English **Article type**: Article **Duplicate**	174	234
		Exclude articles that are irrelevant or weakly relevant to the research question	86	88
3	Eligibility	**Reason 1:** Only focus on a sense of place. **Reason 2:** Only focus on cultural heritage. **Reason 3:** Focus neither on a sense of place nor cultural heritage **Reason 4:** Not a journal article	42	44
4	Included		42	
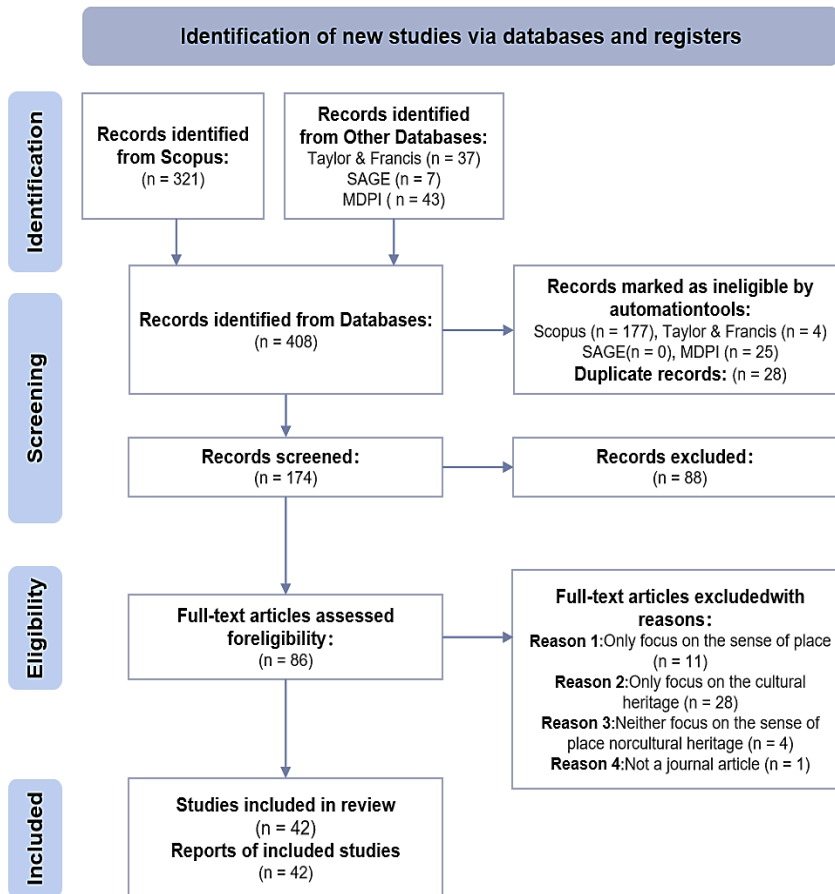
Figure 1. PRISMA chart for reporting systematic reviews

Data Analysis

Considering the context of diverse regional, methodological, and thematic approaches in examining the sense of place in cultural heritage conservation, this study used thematic analysis to comprehensively assess the outcomes of the current state of academic research and identify existing gaps. As an independent qualitative descriptive method, thematic analysis helps identify, analyze, and report data (Braun & Clarke, 2012). Building upon Braun and Clarke's

(2006) six-step method, along with insights from Tozan's (2023) study, the researchers summarized the thematic analysis process as follows: (1) data integration and preparation, (2) coding, (3) classification of themes, and (4) interpretation and drawing conclusions. To minimize bias, three independent researchers individually classified the themes of the selected papers, and after their respective results were examined as a group, they engaged in discussions to reach a consensus (Ayres, 2008).

Thematic analysis was used to code and categorize data into themes for the final set of 42 selected articles. It allowed the researchers to accurately identify relationships between concepts and compare them with the data collected, connecting various learner concepts and perspectives from different conditions throughout the project. The literature was categorized by publication year, country, research methodology, and thematic tags to gain insight into cultural heritage conservation. Through thematic analysis, similar and related themes in different articles were compared and summarized, revealing key issues, research trends, and findings related to a sense of place in cultural heritage conservation. The coding, based on research methodology and themes, further helped understand the methodological characteristics and thematic focuses of studying the sense of place in cultural heritage conservation.

RESULTS AND DISCUSSION

Overview of Existing Research

The researchers coded the final 42 articles. The coding aims to enhance the accuracy of the analysis while establishing a solid foundation for the impending comprehensive overview and assessment, ensuring the rigor of both theoretical and empirical dimensions. Table 2 depicts that the researchers first included the year of publication, authors, study area, a list of research topics, and research methodologies for each article.

Table 2
Details of articles included in the review

No.	Research (authors) and year	Country	Methodology	Topic tags
1	Cantillon and Baker (2022)	Australia	Qualitative	Heritage site-management
2	da Silva and Pereira (2022)	Portugal	Qualitative	Landscape elements (paving)
3	Csurgó and Smith (2022)	Hungary	Qualitative	Cultural-ecosystem
4	Bindi et al. (2022)	Italy	Qualitative	Biocultural Heritage (sustainability)
5	Bahauddin et al. (2022)	Malaysia	Qualitative	Built heritage-composition
6	Al-Alawi et al. (2022)	Germany	Qualitative	Built heritage-sustainability
7	Chen and Shih (2022)	China	Qualitative	Intangible cultural heritage (Folk belief)
8	Muhammad et al. (2020)	Nigeria	Qualitative	Landscape (place-name)
9	Ng and Feng (2020)	China	Quantitative	Heritage site (attitude)
10	Dogan and Kan (2020)	-	Qualitative	Heritage site (immersive)
11	Mısırlısoy (2020)	Hungary	Qualitative	Built heritage (authenticity and identity)

Table 2 *(continue)*

No.	Research (authors) and year	Country	Methodology	Topic tags
12	Hussein et al. (2020)	Egypt	Qualitative	Landscape (component: square)
13	da Silva (2019)	Portugal	Qualitative	Geodiversity (Coats of arms)
14	Gallou and Fouseki (2019)	The United Kingdom	Qualitative	Landscape (sustainability)
15	Taylor (2019)	China	Qualitative	Landscape (cultural values)
16	Lillevold and Haarstad (2019)	Norway	Qualitative	Heritage site (sustainability)
17	Garcia et al. (2018)	Ecuador	Quantitative	Built environment (place attachment)
18	Tan et al. (2018)	Malaysia	Qualitative	Intangible cultural heritage (community)
19	Savić (2017)	Portugal	Qualitative	Cultural mapping (contemporary city)
20	Auer et al. (2017)	Argentina	Qualitative	Cultural (ecosystem)
21	Skjeggedal and Overvåg (2017)	Norway	Qualitative	Heritage site (management)
22	Khakzad and Griffith (2016)	The United States	Mixed	cultural ecosystem (sustainability)
23	Craith et al. (2016)	-	Qualitative	Virtual heritage (film)
24	Ujang (2016)	Malaysia	Qualitative	Historical places
25	Poe et al. (2016)	The United States	Qualitative	Cultural (ecosystem)
26	Yung and Chan (2015)	China	Quantitative	Built heritage (willingness to pay for conserving)
27	Lau and Li (2015)	China	Quantitative	Intangible cultural heritage (Cultural festival)
28	Ivanovic (2014)	South Africa	Quantitative	Heritage site (authenticity)
29	Azmi et al. (2014)	Malaysia	Qualitative	Built environment (place identity)
30	Yung et al. (2014)	China	Mixed	Heritage site (sustainability)
31	Howell and Chilcott (2013)	-	Qualitative	Digital heritage
32	Borrelli and Davis (2012)	-	Qualitative	Eco-museum
33	Wang (2011)	China	Qualitative	Heritage site (authenticity)
34	Wells (2010)	The United States	Qualitative	Built heritage (cultural values)
35	Haas (2009)	Croatia	Qualitative	Landscape (component: square)

Table 2 *(continue)*

No.	Research (authors) and year	Country	Methodology	Topic tags
36	Malpas (2008)	-	Qualitative	New media (possibilities and limits)
37	Budruk et al. (2008)	The United States	Quantitative	Heritage site (authenticity)
38	Dutson and Convery (2007)	The United Kingdom	Qualitative	Community (sustainability)
39	Waterton (2005)	The United Kingdom	Qualitative	Landscape (component)
40	Jamal and Hill (2004)	-	Qualitative	Heritage site (authenticity)
41	Kaltenborn and Williams (2002)	Norway	Quantitative	Heritage site (place attachment)
42	Stewart et al. (1998)	New Zealand	Qualitative	Heritage site(evaluation of interpretation)

Note. "-" indicates that these articles do not specify or mention any countries

Over the previous decades, various articles have discovered that a sense of place can help conserve cultural heritage. Figure 2 clearly illustrates that among the 42 selected studies, the most significant number was published in 2022; 29 research articles were published after 2013, and the remaining 13 were published in or before 2013. In addition, the earliest published related articles date back to 1998. According to statistical analysis of the number of articles published from 1998 to 2022, increasing numbers of scholars have gradually explored a sense of place in cultural heritage despite fluctuations.
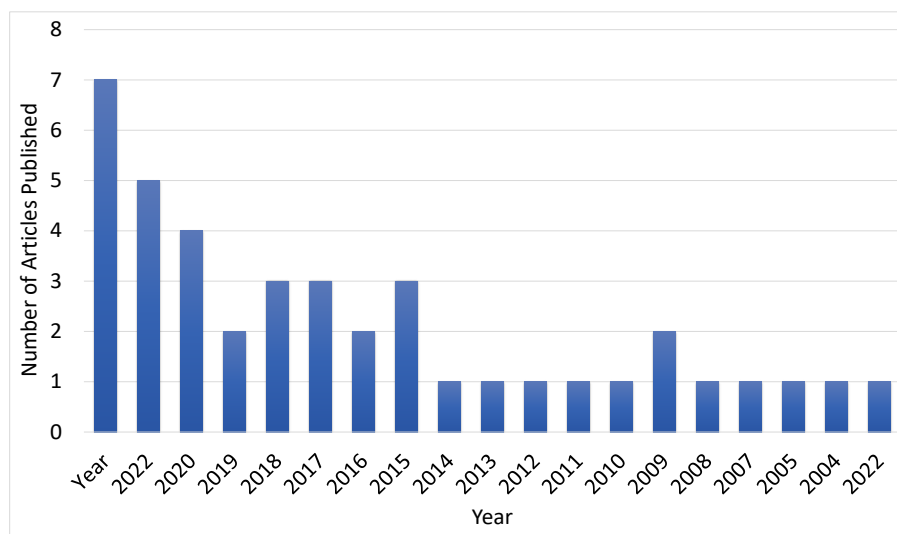

Figure 2. Number of included articles published by year

Second, the selected studies were conducted in various countries and settings. Except for six studies that did not mention the region involved, the remaining ones were conducted in 17 countries: Argentina, Australia, China, Croatia, Ecuador, Egypt, Germany, Hungary, Italy, Malaysia, New Zealand, Nigeria, Norway, Portugal, South Africa, the United Kingdom, and the United States (Figure 3). Developing and developed countries accounted for approximately 35% and 65%, respectively. Moreover, according to the articles, 15 and 21 involved developing and developed countries, accounting for approximately 42% and 58%, respectively.
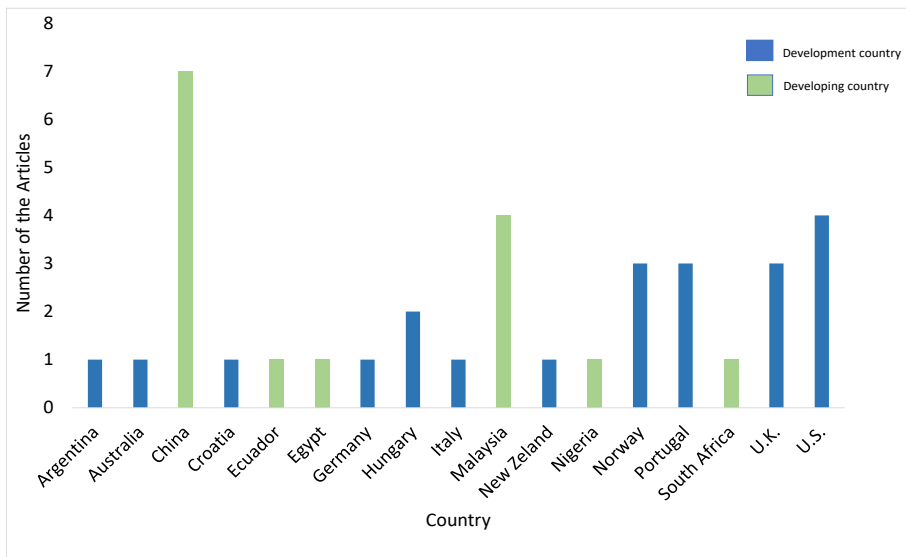

Figure 3. Countries covered by the study

As demonstrated in Figure 4, qualitative research represents 78% of the total. In contrast, only seven articles (17%) were conducted using quantitative methods, while the remaining 5% employed qualitative and quantitative techniques. The predominance of qualitative methods suggests that they are preferred for analysis; it mostly depends on the sense of place being a highly subjective and contextual phenomenon. In addition, qualitative research provides an in-depth understanding of a subject under the local scale or in a specific scenario because it is primarily based on interviews and observations and emphasizes a deep understanding of individuals and groups that can excavate emotions, motivations, and culture behind the connotations of the sense of place. However, compared with qualitative research, quantitative methods focus on quantitative data, suitable for a large-scale and comprehensive understanding of people's overall sense of place.
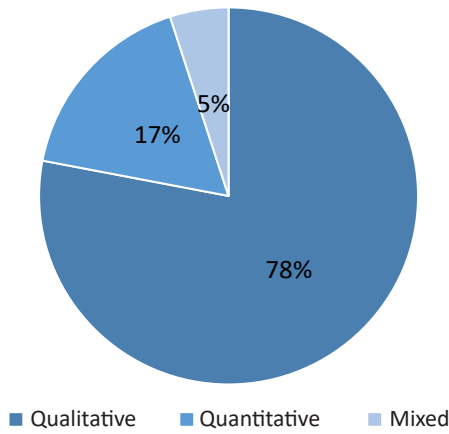
Figure 4. Percentages of the research methodologies of the selected articles

Throughout the coding process, the researchers recorded thematic keywords from the abstracts that concisely conveyed the article's focus. Subsequently, they categorized these keywords into thematic tags, representing the cultural themes identified during the rapid abstract review. From these tags, the researchers further synthesized the insight that all articles report

the interdependence between a sense of place and the conservation and management of cultural heritage. These articles cover material from anthropology, geography, tourism, and heritage management to architecture, among other fields. However, the research mainly focuses on six topics: cultural ecosystem, heritage site, intangible cultural heritage, built heritage, and built environment (Figure 5). Additionally, a few scholars explore the significance of a sense of place in other heritage fields, including new media (Malpas, 2008), eco-museum (Borrelli & Davis, 2012), and digital heritage (Howell & Chilcott, 2013). Moreover, most of these publications stress the importance of a sense of place in maintaining cultural sites.

Relationship Between Sense of Place and Cultural Heritage

To delve deeper into the results, researchers will continue to utilize the coding numerals outlined in Table 2 for a more systematic
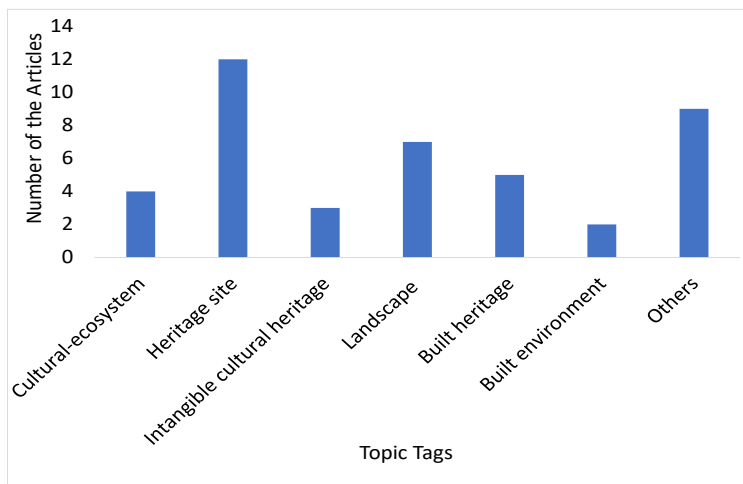

Figure 5. Statistics of research topics

and refined classification and organization of the themes and subthemes within the selected literature. All pertinent data will be methodically arranged in Table 3.

Table 3
Themes and sub-themes of the selected articles

Themes	Subthemes	Articles	Examples
Contribution of sense of place (SOP) to cultural heritage (CH)	Conservation and preservation of CH	1, 5, 6, 7, 34, 41	**1**: "*... sense of place is as much about what shapes the meanings of a heritage site as it is about how that site and its meanings contribute to cultivating individual and collective identity.*" (Cantillon & Baker, 2022, p. 107) **5**: "*The sense of interiority established through the sense of place of St. Peter's Church creates an intimate, reassurance and safeness of the constructed narrative and imageries towards the Portuguese descendants, despite changes in the modern society.*" (Bahauddin et al., 2022, p. 70)
	Sustainability of CH	9, 17, 18, 30, 37	**9**: "*A strong sense of place of tourism site, implying that a person had accumulated a lot of experiences about the tourism site, probably caused greater sensitivity to the benefits and costs brought by tourism.*" (Ng & Feng, 2020, p. 12) **17**: "*Place attachment and challenges of historic cities A qualitative empirical study on heritage values in Cuenca, Ecuador*" (Garcia et al., 2018, p. 397)
Contribution of CH to SOP	Creating an SOP	2, 3, 13, 17, 22, 23, 26, 27, 28, 29, 32, 35, 39	**2**: "*The calçada is a meaningful, recognizable, and memorable trait of Lisbon, having become crucial for its image, for its memorability, which in turn generates sense of place.*" (da Silva & Pereira, 2022, p. 98) **3**: "*...cultural heritage is clearly an essential resource used to shape a sense of place and identities in rural place-making and potentially, tourism development.*" (Csurgó & Smith, 2022, p. 14) **13**: "*As noted by Gray* (2004), *one important manifestation of the cultural value of geodiversity is the strong bond experienced by human communities... when interacting with aspects of their physical environment. These emotional and social ties to native geodiversity provide humans with a feeling of belongingness, of local identity; in other words, they contribute to their sense of place.*" (da Silva, 2019, p. 950)

Table 3 *(continue)*

Themes	Subthemes	Articles	Examples
	Developing an SOP	4, 10, 16, 21, 31, 38, 40, 42	**4**: "*Moreover, shared rules about architecture recovery and transborder development of a pastoral/tourist route (La Routo) show awareness about a development process based on local culture and sense of place, anticipating regional/national laws addressing local policies toward local cultural heritage valorization as a crucial element of territorial regeneration.*" (Bindi et al., 2022, p. 18) **16**: "*We would argue that the link between sustainable urban development and cultural heritage in Røros is mainly associated with the fact that it creates a strong sense of place and keen involvement in local affairs and the development of the city.*" (Lillevold & Haarstad, 2019, p. 10)
	Sustainability of an SOP	8, 12, 14, 33, 38,	**14**: "*...the link between sustainable urban development and cultural heritage in Røros is mainly associated with the fact that it creates a strong sense of place and keen involvement in local affairs and the development of the city.*" (Gallou & Fouseki, 2019, p. 357) **33**: "*The over-emphasis of the authenticity in tourist setting interrupts the continuity of collective memory of local residents and damages the authenticity in its sense of place.*"(Wang, 2011, p. 28)
	Ecology	20, 25	**20**: "*According to the participants, close connection with the natural landscape in general and with the sierras in particular was the principal supply of sense of place,....*" (Auer et al., 2017, p. 92)
	Threats and opportunities of new media in CH and SOP	36	**36**: "*The problem with taking this latter sense of 'place'—place as significant locale—as the basis for thinking further about the sense of place as it relates to new media and to cultural heritage is that it does not actually take us very far at all.*" (Malpas, 2008, p. 201)
Others	Loss of CH identity leading to loss of SOP	11, 19	**11**: "*Loss of relationships between sustainability, community and cultural heritage causes the loss of sense of place and identity.*" (Mısırlısoy, 2020, p. 13)
	Role of place attachment in SOP and CH	15, 24	**15**: "*... place attachment is developed as a result of interaction in diverse activities. The significance commercial functions of the historic places are mixed with cultural, educational and recreational activities have sustained the sense of place.*" (Taylor, 2019, p. 97)

A sense of place is essential for cultural heritage to be conserved and survived. The first dimension is the contribution of a sense of place in conserving cultural heritage. For example, Article 5 analyzed the importance of a sense of place by exploring the history and culture ingrained in St. Peter's Church of Melaka (Bahauddin et al., 2022). Furthermore, Article 6 extensively examined the status of the advocacy of a sense of place in cultural and architectural heritage (Al-Alawi et al., 2022). Article 7 drew attention to how a sense of place affects religious, architectural, and cultural heritage (Chen & Shih, 2022). Article 34 explored the role of revival cultures in establishing a sense of place, which reveals the treatments that revival cultures consider acceptable for their historic environment and the ethical notions of *authenticity* and *honesty* to which traditional revival cultures adhere (Wells, 2010). Alternatively, Article 1 discussed the contribution of a sense of place to the Kingston and Arthur's Vale Historic Area (Cantillon & Baker, 2022).

Article 41 highlighted how a well-defined sense of place can harmoniously reconcile the often conflicting interests of conserving cultural heritage and granting public access to it (Kaltenborn & Williams, 2002). The sustainability of cultural heritage is the second dimension, which is influenced by a sense of place. Article 9 explored the maintenance of cultural heritage and its conservation through residents' attitudes toward cultural tourism in World Heritage sites (Ng & Feng, 2020). Although Article 17 argued that place attachment could effectively enhance the sustainability of heritage values (Garcia et al., 2018), Article 30 investigated this aspect to systematize the implementation of community restoration strategies better (Yung et al., 2014). Conversely, Article 37 emphasized its importance in linking tourists and people to places (Budruk et al., 2008). Article 18 discussed the significance of human–place integration in the sustainability of intangible cultural heritage (Tan et al., 2018).

Second, a powerful sense of place in three dimensions is influenced by cultural heritage. The first is the important role of cultural heritage in shaping a sense of place. By examining the sense of place and tourism, Article 3 revealed the broad character of the importance of cultural heritage (Csurgó & Smith, 2022). Article 22 focused on the contribution of the material culture of fisheries to a sense of place (Khakzad & Griffith, 2016). Articles 13 and 2 provided examples of the key role of geography in establishing a sense of place (da Silva, 2019; da Silva & Pereira, 2022). Moreover, Article 13 shifted their attention to the sustainability of heritage values (Garcia et al., 2018). Article 23 emphasized constructing a new sense of place (Craith et al., 2016). Additionally, Article 26 confirmed the role of historical sites in place identity (Yung & Chan, 2015). Article 32 focused on the function of ecomuseums in preserving heritage (Borrelli & Davis, 2012).

Meanwhile, Article 27 concluded the critical importance of religion and social connection and imagined locality in the sense of place of people (Lau & Li, 2015).

Article 38 argues that authentic heritage attributes contribute to a sense of place (Ivanovic, 2014). Article 29 found that the physical built environment is an important starting factor for place identity (Azmi et al., 2014), in addition to Article 35, which argued that the built environment is a main factor in creating a sense of place (Haas, 2009). Meanwhile, Article 39 focused on the character of archaeological perspectives in British cultural landscapes and stated that museum landscapes provide identity, a sense of belonging, and a sense of place (Waterton, 2005). These origins demonstrate that cultural heritage is important in establishing a sense of place.

The next dimension is the contribution of cultural heritage to creating a sense of place, and scholars explore the contribution of cultural heritage management to creating a sense of place. Article 21 highlighted that cultural heritage management contributes to the improvement of a place (Skjeggedal & Overvåg, 2017). The importance of digital heritage and interpretive practice in generating a meaningful sense of place was emphasized by Articles 16 and 31 (Howell & Chilcott, 2013; Lillevold & Haarstad, 2019). Article 38 emphasizes a sense of place and community development (Dutson & Convery, 2007). Moreover, the importance of historical sites to immersive experiences was examined by Dogan and Kan (2020; Article 10). To improve people's comprehension of place, Article 42 created a novel method for assessing cultural heritage interpretive services (Stewart et al., 1998).

Furthermore, Article 4 explored the critical role of biocultural heritage in developing a sense of place (Bindi et al., 2022). Alternatively, Article 40 developed a professional framework of authenticity indicators for cultural heritage tourism, which provides essential guidance for conserving cultural heritage (Jamal & Hill, 2004). Articles 8 and 12 also confirm that place names might conjure cultural landscape heritage, while cultural memory is a crucial aspect that influences the sense of place (Hussein et al., 2020; Muhammad et al., 2020). Articles 14 and 33 demonstrated how cultural heritage might contribute to the social sustainability of a rural landscape (Gallou & Fouseki, 2019; Wang, 2011), whereas Article 38 focused on the larger dimension of sense of place and community development (Dutson & Convery, 2007). These aspects construct a third dimension, the critical value of cultural heritage in maintaining a sense of place.

In addition to the two abovementioned aspects, some studies emphasized other areas. Article 20 examined the importance of the natural environment in creating identity, sense of place, and cultural legacy (Auer et al., 2017). Meanwhile, Article 25 revealed the special function of a sense of place in ecological restoration (Poe et al., 2016). Article 36 used a new media lens to evaluate the opportunities and challenges that arise between cultural heritage and sense of place (Malpas, 2008). Article 11 pointed out that the loss of identity dependence on heritage buildings will firmly squeeze

the sense of place (Mısırlısoy, 2020), and Article 19 posited that cultural maps provide a specific basis for reshaping the sense of place (Savić, 2017). According to Taylor (2019; Article 38), place attachment and cultural values impact a sense of place and cultural heritage landscapes. Article 24 investigated emotional perceptions derived from attachment to historical urban places in Kuala Lumpur (Ujang, 2016).

Potential of Sense of Place in Cultural Heritage

The importance of a sense of place has been recognized in conserving cultural heritage as a crucial factor in sustaining the distinctive cultural worth of a region. A sense of place is a pervasive, deep-rooted, and enduring sense of identity and attachment to a place (Azmi et al., 2014). As a multidimensional concept, the sense of place is often difficult to measure, but it is crucial for understanding the value of a particular place and the role it plays in conserving or preserving cultural heritage. Table 4 summarizes the potential of a sense of place in cultural heritage after the researchers examined them.

Table 4
Potential of a sense of place in cultural heritage

Potential of sense of place in cultural heritage	Articles	Examples
Encourages social sustainability	14, 20, 21.22, 25, 39	**21**: "*The focus in planning and management should shift from the competitive attractiveness approach towards using cultural heritage to strengthen inhabitants' knowledge, identity and 'sense of place' as part of a local community development approach.*" (Skjeggedal & Overvåg, 2017, p. 43)
Facilitates visitor engagement and interpretation of cultural heritage	4, 7, 10, 20, 30, 33, 36, 42	**10**: "*Sense of place is intrinsic part of this model for the visitor in order to become part of the context and enjoy the immersive experience.*" (Dogan & Kan, 2020, p. 95) **42**: "*Sense of place is a valid, probing and insightful conceptual tool in evaluation... it expresses the interrelationships between people and their experience of place, and services such as interpretation that enhance or impede those experiences*" (Stewart et al., 1998, p. 265)
Promotes community building and development and supports local revitalization	2, 6. 12, 15, 27, 31, 34, 35, 38	**12**: "*...intangible values such as memories, sense of place, place attachment and identity are very important for marking the place experience and are responsible for psychosocial well-being*" (Hussein et al., 2020, p. 10) **38**: "*Nevertheless, the concept of sense of place appears to be a potentially useful mechanism to frame community sustainability projects and to serve as a viable umbrella term for community-based heritage/cultural projects.*" (Dutson & Convery, 2007, p. 45)

Table 4 *(continue)*

Potential of sense of place in cultural heritage	Articles	Examples
Strengthens identity and fosters a sense of belonging	3, 8, 10, 13, 16, 23, 29, 32	**29**: "*Symbiosis between physical forms of environment and social meanings are central to the delineation of identity.*" (Azmi et al., 2014, p. 62) **32**: "*Globalization and cultural homogenization have been factors in this rediscovery of local heritage and territorial identity.*" (Borrelli & Davis, 2012, p. 36)
Develops heritage tourism	3, 9, 16, 18, 28, 40	**3**: "*Sometimes, it may be as fruitful to focus on the sense of place, cultural heritage conservation or the revival of traditions and identity creation for local communities to try to develop tourism.*" (Csurgó & Smith, 2022, p. 14)
Promotes the protection and preservation of cultural heritage	1, 2. 5, 8, 10, 11, 21, 24, 26, 33, 37, 41	**26**: "*The results indicate that sense of place, social inclusion and cohesion and community participation are significantly correlated to the willingness to pay per month amount.*" (Yung & Chan, 2015, p. 98) **33**: "*If the priority objective of preserving a historic city is to continue the local way of life, it is important to approach the discourses of authenticity of a historic city from the settlement's integrity, including the authenticity in physical setting, tourist setting and sense of place.*" (Wang, 2011, p. 18)

The first finding is that a sense of place is essential for appreciating the importance of cultural heritage and its importance in promoting social sustainability. Several studies determined the role of a sense of place in promoting sustainable development, protecting traditional rural biomes, and supporting local transformation (Auer et al., 2017; Gallou & Fouseki, 2019; Khakzad & Griffith, 2016; Poe et al., 2016; Skjeggedal & Overvåg, 2017; Waterton, 2005). The selected studies emphasized the significance of comprehending people's emotional and psychological ties to particular places and how these ties may encourage environmentally friendly growth and cultural heritage conservation.

Second, a sense of place can facilitate visitor engagement and the explanation of cultural heritage. Studies that explored the use of immersive experiences, digital interpretation, and new media as tools for encouraging visitor engagement and appreciation of cultural heritage support this finding (Bindi et al., 2022; Dogan & Kan, 2020; Malpas, 2008; Stewart et al., 1998). These articles and those of da Silva and Pereira (2022) and Wang (2011) demonstrate how a sense of place may foster memorable experiences for tourists, advance one's knowledge of the cultural heritage of a place, and motivate stewardship of these places.

Third, a sense of place benefits community building and development and supports local revitalization. Research on the importance of a sense of place in community development demonstrates that sense of place can be used to strengthen connections among community members and foster social cohesion and a sense of belonging (Al-Alawi et al., 2022; Dutson & Convery, 2007; Haas, 2009; Howell & Chilcott, 2013; Hussein et al., 2020; Lau & Li, 2015; Savić, 2017; Taylor, 2019; Wells, 2010). Moreover, these studies examine how a sense of place could encourage local revitalization, foster community growth, and deepen the bond between individuals and their surroundings.

Fourth, a sense of place reinforces identity and a sense of belonging. According to the stream of research on the relationship between place and self-identity (Azmi et al., 2014; Borrelli & Davis, 2012; Craith et al., 2016; Csurgó & Smith, 2022; da Silva, 2019; Dogan & Kan, 2020; Lillevold & Haarstad, 2019; Muhammad et al., 2020), understanding the emotional and psychological ties of people to particular places is crucial for fostering sustainable development, conserving cultural heritage, and for leveraging places to promote a sense of belonging and strengthen identity.

Fifth, creating historic tourism requires a strong sense of place. Research exploring the context of tourism emphasizes understanding the relationship between a sense of place and tourism experience. Moreover, it examines how a sense of place can be harnessed to promote sustainable tourism and used to increase visitor engagement and satisfaction (Csurgó & Smith, 2022; Ivanovic, 2014; Jamal & Hill, 2004; Lillevold & Haarstad, 2019; Ng & Feng, 2020; Tan et al., 2018).

Finally, a sense of place is becoming an increasingly vital component of conserving and preserving cultural heritage. According to several studies, a sense of place is essential for conservation efforts and the preservation of cultural heritage. Apart from this notion, these studies focused on what it means to grasp the use of a sense of place to advance cultural heritage conservation, sustainable development of cultural heritage, and the preservation of traditional and indigenous cultural practices (Bahauddin et al., 2022; Budruk et al., 2008; Cantillon & Baker, 2022; da Silva & Pereira, 2022; Dogan & Kan, 2020; Garcia et al., 2018; Kaltenborn & Williams, 2002; Mısırlısoy, 2020; Muhammad et al., 2020; Skjeggedal & Overvåg, 2017; Ujang, 2016; Wang, 2011; Yung & Chan, 2015).

CONCLUSION

This systematic literature review illuminates the multifaceted role of the sense of place in cultural heritage conservation. The synthesis of reviewed articles underscores that the sense of place is instrumental in bolstering sustainable development, amplifying visitor engagement, and adeptly facilitating the digital interpretation of cultural and architectural heritage.

Nevertheless, this nexus inherently presents challenges and complexities. Integrating evolving digital technologies, including virtual and augmented reality,

poses opportunities and challenges. These advancements offer innovative modalities to engage with and experience cultural heritage. However, they also bring critical questions regarding the potential dilution of the authentic and intrinsic sense of place, necessitating a nuanced and rigorous exploration of phenomenological approaches and the embodiment of cultural narratives.

Furthermore, while the sense of place's influential role is evident, gaps and opportunities for enrichment in applying this concept within the conservation practice persist. A nuanced understanding of its interplay with sustainable development, digital interpretation, and enhancing visitor engagement and satisfaction is requisite. It is compounded by the linguistic limitation of this review, which is confined to English-language sources, thus underscoring a need for more inclusive, varied, and cross-cultural research engagements.

While the review affirms the integral role of the sense of place in cultural heritage conservation, it concurrently illuminates the necessity for an expanded and more inclusive research landscape. Focusing on cross-cultural, multidisciplinary, and technologically integrated approaches is paramount to unveil the latent potentials and address the intricate challenges inherent in the dynamic interplay between the sense of place and cultural heritage conservation. The pivotal findings of this review, thus, serve not only as an affirmation but also as a clarion call for a deeper, broader, and more nuanced engagement in the ongoing

discourse on cultural heritage conservation in the contemporary global landscape.

Implication for Practice

The selected articles in this review demonstrate a strong link between a sense of place and cultural heritage conservation and the potential of a sense of place in the conservation of cultural heritage. The selected studies demonstrate that a sense of place is crucial in conserving cultural heritage and preserving and managing cultural resources. Therefore, this comprehensive research assessment demonstrates the promise of a sense of place in conserving cultural heritage. The results can encourage the sustainable development of cultural heritage, increase visitor engagement and satisfaction, and facilitate the preservation of cultural and architectural heritage. In this regard, a sense of place is crucial for conserving and preserving cultural heritage sites and landscapes. Consequently, in cultural heritage management and conservation practices, governments and relevant institutions may consider adopting several measures to enhance the importance of a sense of place.

A primary and essential approach for governments and cultural heritage managers is to promote social sustainability through close collaboration with local communities. This objective can be effectively achieved by organizing community activities, workshops, and educational programs tailored to heighten people's awareness of and active participation in their cultural heritage. Community involvement is highlighted in

these efforts as it fosters a stronger sense of ownership and responsibility among residents towards their cultural heritage.

Furthermore, by recognizing the pivotal role of tourism in several regions, governments can actively support the development of sustainable tourism projects. It entails encouraging tourists to appreciate cultural heritage and ensuring they respect and protect it. Measures include establishing guidelines for visitor behavior, providing cultural education, and actively facilitating interaction between tourists and local communities.

Finally, governments should reinforce cultural heritage protection policies to ensure that sites with a strong sense of place receive proper conservation. It includes offering financial support, strengthening cultural heritage protection regulations, and actively involving communities in conserving their cultural heritage. These comprehensive measures collectively promote and safeguard cultural heritage with a deep-rooted sense of place.

Future Outlooks

This systematic literature review reveals the intricate relationship between a sense of place and the conservation and management of cultural heritage, encompassing various disciplinary domains such as anthropology, geography, tourism studies, heritage management, and architecture. Therefore, future research endeavors can further explore the intersections among these disciplines to gain a comprehensive understanding of the role of a sense of place. Interdisciplinary

research can contribute to uncovering best practices from different fields, thereby better addressing cultural heritage conservation challenges.

Furthermore, while qualitative research has played a pivotal role in elucidating the complexity and profundity of a sense of place, future research can use more quantitative methodologies to quantify the impact of a sense of place on cultural heritage. Researchers can provide quantitative evidence to assist decision-makers in comprehending the importance of a sense of place by using surveys, statistical analyses, and data modeling. It is conducive to a better understanding people's perceptions and emotions of cultural heritage sites and avoids the limitation of relying extensively on individual subjective experiences.

In addition, future research may consider conducting more cross-national comparative studies to understand the similarities and differences in the sense of place across diverse cultural contexts. For example, additional research on wealthy and developing nations is required to broaden the geographic focus and raise the bar on methodology. Comparative research can offer a broader perspective, promoting sharing of best practices in cultural heritage conservation on a global scale. It will aid in determining the universality of a sense of place in various cultural and geographical settings and potential cultural variations.

Finally, as digitalization and new media continue to advance, future research can explore the role of these technologies in enhancing a sense of place and cultural

heritage conservation. Subsequent studies may focus on how virtual reality, augmented reality, and social media enhance visitor engagement and disseminate cultural heritage. It will contribute to the convergence of cultural heritage management and technology.

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The Implications of Palm Cooking Oil Price Increases in Malaysia

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ABSTRACT

Domestic palm oil consumption in Malaysia increased to about 3.37 million metric tons in 2022. This number is expected to increase further due to population growth and consumer preferences for palm oil cooking oil. However, in 2016, the government withdrew its subsidy on palm cooking oil, increasing its price by 48.9%. Recently, the government proposed to use a floating price for palm cooking oil. These changes have left direct and indirect impacts on food producers and consumers. Therefore, this paper examines the impact of an increase in the price of palm cooking oil on food producers (directly) and consumers (indirectly). This study applied the Leontief price modelling technique and simulated a scenario for the price changes in the production cost. The simulation results indicated that costs and prices changed. The results found that the most significant cost change came from restaurants, 52.0%, while other price changes were from oil palm (29.6%) and restaurants (17.4%). This study also used the profit index to calculate the profit food producers and services gained. Based on this scenario, food producers should revise their prices of goods and services since they still gain profit. It was recommended that the government revise the price of palm cooking oil by providing subsidies or incentives to the food producer or consumer. The fluctuation in palm oil prices impacts the price of palm cooking oil in the market. If the government does not revise cooking oil prices, it will affect food consumers and producers.

Keywords: Cooking oil, key sector, Leontief price model, palm cooking oil, simulation

INTRODUCTION

Malaysia was an agricultural nation before transforming into an industrialised nation over the last few decades. Despite an emphasis on technological modernisation since the early 2000s, the agricultural sector has emphasised the mantra, 'Agriculture is business'. This slogan refers to transforming agricultural activity into a business activity that concentrates on self-sufficiency and is profitable for farmers. This activity aims to transform Malaysia into an industrial and modern agricultural nation after decades of industrialisation to improve national food security and bolster exports. Most basic crops and foods like rice, vegetables, coffee, and cocoa are suitable for cultivation in Malaysia. Thus, this country can reduce food imports if domestic food needs are sufficient. However, palm oil is the country's focus over other crops like rice and vegetables.

According to the Department of Statistics Malaysia (2020), palm oil has been the focal point of growth, followed by paddy, pineapple, sugar cane, cocoa and other minor crops. From agriculture activities, the palm oil industry is the major contributor to the gross domestic product (GDP) from the agriculture sector at 35.2% in 2021, followed by other agriculture (29.3%), livestock (16.7%), fishing (11.3%), rubber (2.3%) and forestry and logging (5.2%). The agriculture sector of Malaysia's GDP was led by palm oil in 2022, with 4.9% of the GDP. Other agriculture activities contributed 1.6 per cent to the country's GDP. The agriculture industry made up 8.9% of the GDP in 2022.

The palm oil industry in Malaysia is profitable, and many oil palm companies are listed on the Kuala Lumpur Stock Exchange (Basiron, 2008). Figure 1 shows that the price of crude palm oil increased by 26.3% to USD 715 per ton in 2020 compared to USD 566 in 2019. Figure 1 shows the trend of crude palm oil with an average growth rate of 151%. It shows that as the price of crude palm oil increases, the price of crude palm oil will also increase because cooking oil is derived from palm oil.

One of the leading products produced by the palm oil industry is oils and fats, including cooking oil, which fulfil the basic needs of consumers and food products and services in Malaysia, contributing to the changes in food production costs and prices. Most consumers in Malaysia use palm cooking oils in their daily meals compared to other seed oils and fats such as canola oils, olive oil, sunflower oil and grape seed oil. According to Izzah et al. (2015), 90% of consumers prefer to consume palm cooking oil due to its affordable price. The quality of palm cooking oil is equivalent to other oils and fats in the market, regardless of the price. Based on a study by Mayada and Juwita (2023), the increase in the price of cooking oil influences the change in food consumption patterns, which is a decrease in the consumption of some food needs other than cooking oil.

Undoubtedly, cooking oil is the most important input in the production process and consumers' daily cooking. In the past, cooking oil was subsidised, and the price was still reasonable for most household
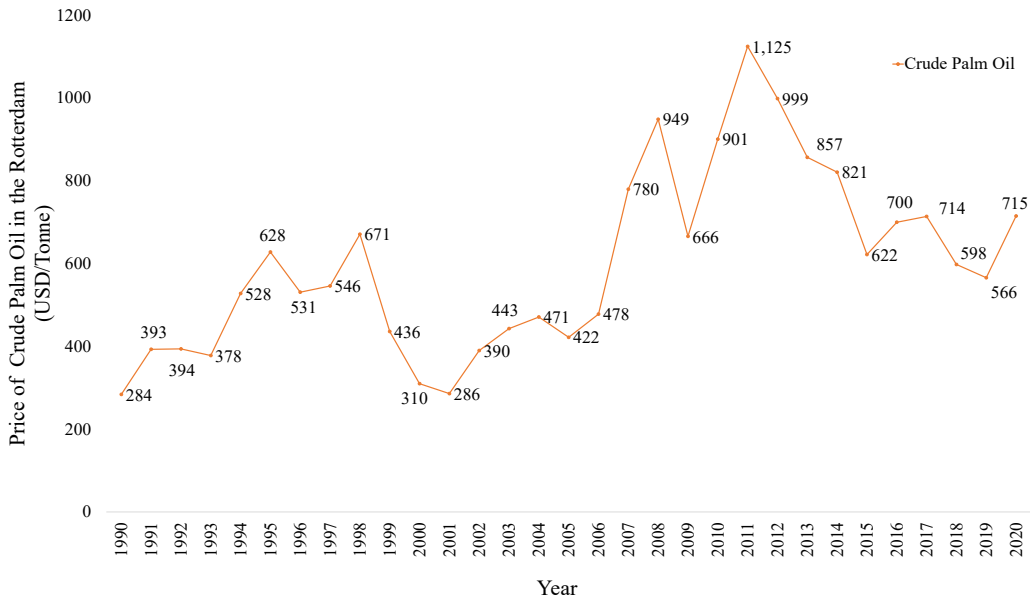
Figure 1: Price of crude palm oil in the Rotterdam (USD/Tonne)

consumers. However, if the subsidy is removed, the price of palm oil will follow the current trend of crude palm oil and become less affordable to the average household. Increasing cooking oil prices can impact the cost of living and inflation, affecting people's purchasing power. In recent years, the Malaysian government has taken steps towards reforming subsidies, including those for cooking oil. One of its goals is to relieve pressure on the government budget and ensure aid is better targeted.

On November 1, 2016, the government withdrew the subsidy on cooking oil. Therefore, the new price of cooking oil increased by almost 50%. However, the government continues to subsidise packet cooking oil by 1 kg at a selling price of RM2.50 (Saari et al., 2016). The price of cooking palm oil has directly decreased consumer purchasing power by 2% of the whole consumer food expenditure; thus, consumers' available income will likely become smaller (Saari et al., 2016). It was the first time in ten years that the price of palm cooking oil had increased in Malaysia. The price change's indirect impact refers to household expenditure on ready-to-eat food that uses cooking oil as its raw material, such as fried foods common among streetside stalls and fast-food restaurants. Due to this, low-income consumers were remarkably hurt by the rising cooking oil prices.

According to the Department of Statistics Malaysia, the Consumer Price Index (CPI) for January 2023 decreased to 3.7% from 3.8% in December 2022. Malaysia's increase in inflation in January 2023 was driven by restaurants and hotels (6.8%), food and non-alcoholic beverages (6.7%) and transportation (4%), household appliances and a collection of household

routine maintenance (3.5%); recreational and cultural services (2.7%); various goods and services (2.3%) and health (1.6%), while housing, water, electricity, gas and other fuels and education recorded increases of 1.5% and 1.3%, respectively. Meanwhile, alcoholic beverages, tobacco, clothing, and shoes trended down 0.8% and 0.5%, respectively, compared to January 2022.

In the production sector, the impact of the increase in cooking oil prices on the food producer is transmitted through the input cost. Cooking oil is a direct input cost to food industries and services sectors such as restaurants and hotels, food stalls, preserved seafood, and Small and Medium Enterprises (SMEs) food products. Consequently, food manufacturers and services also took this opportunity to increase the price of goods and services due to the increase in their cost of production since cooking oil is a significant input to their production goods and services, particularly in food manufacturing, food stalls, restaurants, and hotels. Notwithstanding, producers aim to maximise profits by minimising production costs (Mankiw, 2007). Due to increasing cooking oil prices, producers are willing to use recycled cooking oil rather than new processed cooking oil to maintain their quantity of goods and services but ignoring the health issue of consumers' well-being. In Malaysia, there is rising worry about food safety due to the increasing tendency to combine fresh and old cooking oil. Blending high-quality edible cooking oil with recycled oil has become more common in recent decades, driven by strong market demand and profit margins. Mixing cooking oil by replacing or combining cheaper or waste oils is an irresponsible behaviour motivated by greed. The more severe behaviour of dissolving inedible plastic in non-hot oil while frying to boost crispness and lengthen the shelf life of fried treats has been a growing concern.

According to Datuk Nadzim Johan, Activist Chief of the Malaysian Muslim Consumer Association, over 90% of restaurants and food stalls in Malaysia use recycled cooking oil (Ismail, 2013). Ethical producers or sellers should be concerned about consumers' health as it can trigger health-related problems like cancer and other diseases. This recycled cooking oil from around the country benefits third parties, earning millions of dollars. In the end, it was the consumers that had to pay a high price. The importance of perceived consumer efficacy in consumers' environmental and ethical awareness and utilisation of associated food product information must be considered (Lieke et al., 2023). Consumers may choose differently depending on criteria, including price, fat content, brand, flavour, oil source, advertising, and peer pressure. The unsaturated fats in cooking oil oxidise when heated, which is the most significant issue in health awareness (Kumaran, 2023).

Meanwhile, consumers become stressed by the high price of goods and services. Therefore, this study uses the Leontief price modelling technique to examine the impact of the increasing price of palm cooking oils in Malaysia and identify which sector gains the highest profit due to increased palm cooking oil prices.

Main Features of the Palm Oil Industry
Malaysia became the world's second leading exporter of palm oil after Indonesia in 2017. As the world's second-largest palm oil producer after Indonesia, Malaysia needs to capture the full potential of existing downstream opportunities and diversification to sustain its growth in the palm oil sector. Therefore, based on Jaafar et al. (2015), the Malaysian palm oil industry is more interconnected to the rest of the production sector than Indonesia (Figure 2).
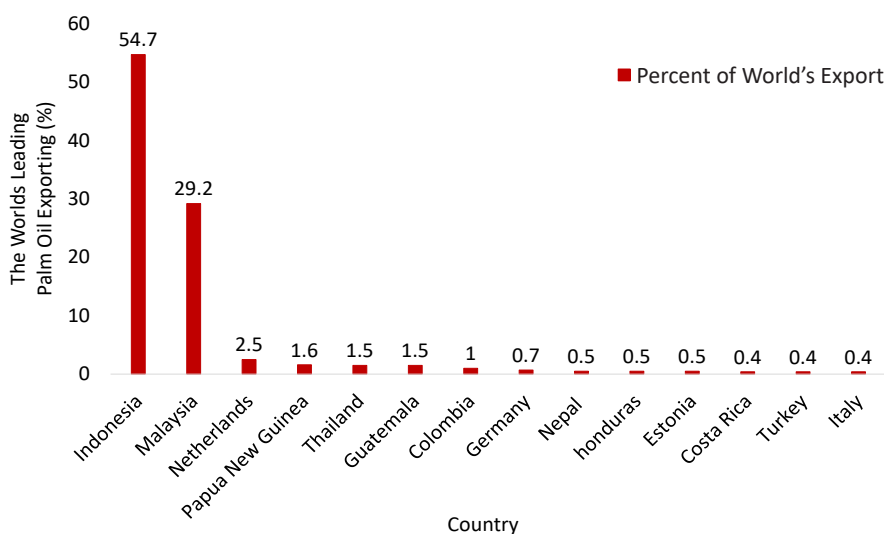

Figure 2. The world's leading palm oil exporting countries, 2021
Note. Adapted from Daniel (2023)

The development of palm oil downstream can be accelerated through the palm oil industry cluster as a catalyst in establishing value chains for the palm oil industry and developing related support industries (Abdul Manan et al., 2014). The production of palm oil downstream, including palm milk, should be domestically and internationally commercialised. Palm milk has many advantages, including low cholesterol, low fat, durability, viability and safety. The Ministry of Primary Industries targeted domestic consumption of palm products and commodity-based downstream products to increase by 10% through the 'Love My Palm Oil' promotion campaign.

Malaysia's principal agency that highly supports and promotes activities downstream is the Malaysia Palm Oil Board (MPOB). The primary role of these agencies is to carry out the task of strengthening the private sector as a critical role in promoting the palm oil industry (Yasin et al., 2017). Ali et al. (2015) proposed solid biomass

residues and liquid effluent as a new green downstream industry that could be created through an integrated biorefinery concept.

In terms of demand, the export volume of Malaysia's palm oil increased in 2018 compared to 2017. Palm oil exports increased significantly by 6.6% to 24.82 million tonnes compared to 23.29 million tonnes recorded in 2017. It contributed to 2.83 million tonnes or 17.6% of total Malaysian palm oil in 2017, followed by the European Union and China, accounting for 2.06 and 1.88 million tonnes, respectively (Figure 3).
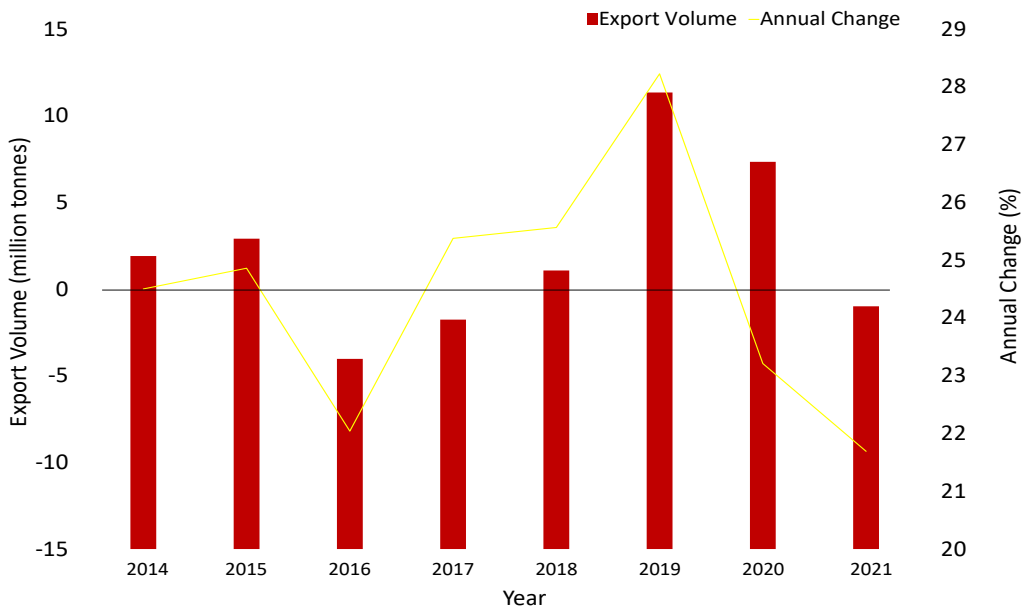

Figure 3. Export of palm oil products (million tonnes) and its growth in 2021
Note. Adapted from MPOB (2021)

The export of palm oil during the period was due to the increase in palm oil demand by major importing countries such as India, Pakistan, China and the European Union. Nonetheless, export to India remains the largest market.

Literature Review

Malaysia's history in the palm oil industry started in 1917 when the dura palm oil of Dura (thick shell) from Rantau Panjang, Selangor, was planted in the Tenmaran Estate, Kuala Selangor. Commercial cultivation began with several kinds of research to understand the inheritance of oil palm fruit. The government introduced oil palm cultivation in Malaysia to eradicate poverty among the rural population. In the 1960s, the Federal Land Development Authority (FELDA) opened new lands to explore and become oil palm estates. The positive growth of industries related

to downstream activities can create job opportunities for poverty eradication (Abdullah et al., 2009).

The palm oil industry employs over 600,000 people, including highly skilled and low-skilled labour. Research and innovation activities have also added new jobs for Malaysians every year. The country created over 66,000 new job opportunities and improved the sector's contribution to the gross national income (GNI) of RM 30 billion (USD 9.5 billion) under the 1Malaysia Biomass Alternative Strategy (1MBAS). It shows that Malaysians have benefitted from the growth and profitability of the palm oil industry. Compared to Indonesia, the main goal of the New Order regime is to revitalise the plantation sector to increase export earnings, utilise land and create job opportunities on the outer islands (Badrun, 2011; Zen et al., 2016).

Among the products produced is palm cooking oil, which has advantages over other oils such as soy, olive, sunflower and coconut (Peng et al., 2017). Cooking oil is essential for many Asians, especially Malaysia and Indonesia (Dauda et al., 2021; Noor & Hua, 2016). Malaysia is also the world's second-largest producer of palm cooking oil, trailing only Indonesia (Sarjadi et al., 2019). The Malaysian habit is not separated from the use of cooking oil in preparing many types of cuisine due to its low cost and high oxidative stability when used for frying (Ling et al., 2022; Yaakob et al., 2013). Bakeri et al. (2020) claim that internal and external perceptions, nationality

traits, and local variables like social factors, products, and governmental regulations may affect consumer behaviour regarding food oils. Regardless of these factors, the demand for vegetable oil has increased due to population growth. This increase, exacerbated by the advent of its usage in biofuels, has led to land use change from tropical forest to oil palm production (Jones et al., 2018).

Various instances showed the increase in the price of goods and associated price changes in other goods and services. Extensions of a standard Leontief model included the input-output (I/O) price models by Sharify and Sancho (2011) and Sharify (2013), which studied the price shock effect from taxation and subsidies on general prices. Liew and Liew (1988) applied the I/O variable model to measure the impact of primary input prices on prices and outputs. Dietzenbacher (1997) proposed an alternative interpretation by suggesting the Ghosh model be viewed not as a quantity model but as a price model, which was in other discussions on alternative interpretations of the Ghosh model (De Mesnard, 2007; Miller & Blair, 2009; Oosterhaven, 1996). Ghosh's price model and Leontief's price model showed the same results (Miller & Blair, 2009).

There is minimal study on the impact of oil and fat prices, but there are many studies on the impact of petrol products and electricity prices and energy consumption in Malaysia (Bekhet & Abdullah, 2010; Chik et al., 2017; Saari et al., 2016). Lim

and Yoo (2013) showed that an increase in electricity price by 10% in the Korean economy is estimated to be 0.4367% using the input-output price model. Logar and van den Bergh (2013) focused on the tourism sector and found that rising oil prices led to declining demand for tourism services in Spain, such as the air, water, land, and rail transport sectors. However, Filipski et al. (2017) observed the impact of saffron price volatility on the Morocco economy using unique micro-household data and local economy-wide modelling methods extended from Taylor and Filipski (2014).

METHODOLOGY

Price theory is used as the underpinning theory in this study. Price theory focuses on how supply and demand interact to form market prices. The price theory aims to explain how prices are formed. It is explained in microeconomics by the law of demand, the law of supply, and their equilibrium in individual markets and across markets. In setting policies such as fiscal and monetary policy, the government must consider market forces, as in macroeconomics like wages and interest rates, to determine the price of certain goods, including the price of cooking palm oil. Regarding consumer demand, firm supply, and market factors, price theory aims to understand, explain, and predict prices and pricing decisions.

This study used the Malaysia input-output (I/O) table (2010) from the Department of Statistics Malaysia.

In Malaysia, the Economic Census is conducted every five years; therefore, the I/O table is constructed and published by the Department of Statistics every five years. The I/O tables for 1978, 1983 and 1987 consist of 60 sectors, but the latest table for 2010 was extended into 124 sectors. This change indicates that the more recent IO tables provide a more detailed sectoral breakdown due to the diversification of economic activities and expansion of the economy. In the input-output table, palm oil (refined palm oil) is placed under refined palm oil to manufacture vegetable and animal oils and fats, a part of the manufacturing sector. By referring to the MSIC 2008 Ver.1 standard, refined palm oil is classified under item 15143.

Input Output Price Model

This study focused on the impact of an increase in the price of palm cooking oil on consumers. Producers and consumers are likely to be affected if the effects of higher oil and fat costs are simultaneously considered. This study simulates the impact of an increase in the price of palm cooking oils by 48.9% as the main scenario. This percentage is derived from the price ratio of subsidy withdrawal in cooking oil palm. This study applied the input-output price model in a 124 x 124 matrix form (Department of Statistics Malaysia, 2010). Similar to the quantity model, the price model distinguishes between endogenous and exogenous components (Chik et al., 2017; Miller & Blair, 2009; Saari et al., 2016). The endogenous component was the

Leontief inverse matrix, while exogenous components were the costs of primary inputs. The exogenous expenditure coefficients (vector **a = m + l + v + t**) were split into coefficients for imported products (m), Labour (l), Value added (v) and taxes (t). Leontief inverse matrix was transposed, and the exogenous cost vector was expressed in column vectors instead of row vectors. Therefore, the solution for the price model was represented by the following equations:

$$P = (I-A)^{-1'} (mp_m + lp_l + vp_v + tp_t)$$

Equation (1)

$$P = L' (mp_m + lp_l + vp_v + tp_t)$$

Equation (1a)

$$P = L' (m + l + v + t)$$ Equation (1b)

Where P is the price vector for a particular sector, A' is a transposition of the input-output coefficient matrix, while pm, pl, pv, and pt are the price vectors of import coefficient, labour, value-added and indirect tax, respectively. m, l, v, and t are denoted as import coefficient (import per unit of output), labour coefficient (the composition of employees per unit of output), value-added coefficient (value-added per unit of output), and indirect tax coefficient (tax per unit of output), respectively. From Equation 1 to Equation 1b, the base year's primary input (costs) coefficient was calculated.

Equation 2 was represented in matrix form as follows:

$$
\begin{bmatrix} P_1 \\ \vdots \\ P_6 \\ \vdots \\ P_{124} \end{bmatrix} =
\begin{pmatrix}
(1-a_{11}) & \cdot & -a_{16} & \cdot & -a_{1124} \\
\cdot & \cdot & \cdot & \cdot & \cdot \\
\cdot & \cdot & \cdot & \cdot & \cdot \\
-a_{61} & \cdot & (1-a_{66}) & \cdot & -a_{6124} \\
\cdot & \cdot & \cdot & \cdot & \cdot \\
\cdot & \cdot & \cdot & \cdot & \cdot \\
-a_{1241} & \cdot & -a_{1246} & \cdot & (1-a_{124124})
\end{pmatrix}^{-1}
\begin{bmatrix}
m_1 & + & l_1 & + & c_1 & + & t_1 + & a_{16}P_6 \\
\cdot & & \cdot & & \cdot & & \cdot & \cdot \\
\cdot & & \cdot & & \cdot & & \cdot & \cdot \\
m_6 & + & l_6 & + & c_6 & + & t_6 + & a_{66}P_6 \\
\cdot & & \cdot & & \cdot & & \cdot & \cdot \\
\cdot & & \cdot & & \cdot & & \cdot & \cdot \\
m_{124} & + & l_{124} & + & c_{124} & + & t_{124} + & a_{1246}P_6
\end{bmatrix}
$$

In both equations, the variable on the left side was considered endogenous. Exogenous cost components determined the price of sectors (P1 to P124). For simulation purposes, there is a 48.9% increase in palm cooking oil products (P6 as an exogenous variable) in the country (on November 1, 2016, the government withdrew the cooking oils subsidy by 48.9% for all cooking oil brands). The increase in this price has also affected other sectors. The following equation was used to run this simulation.

$$\Delta p = L' (mp_m + lp_l + vp_v + \Delta tp_t)$$

Equation (2)

Then, the above matrix was rearranged as follows:

$$\begin{bmatrix} P_1 \\ \cdot \\ \cdot \\ t_6 \\ \cdot \\ \cdot \\ P_{124} \end{bmatrix} = \begin{pmatrix} (1-a_{11}) & \cdot & 0 & \cdot & -a_{1124} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ -a_{61} & \cdot & 1 & \cdot & -a_{6124} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ -a_{12124} & \cdot & 0 & \cdot & (1-a_{124124}) \end{pmatrix}^{-1} \begin{bmatrix} m_1 & + & l_1 & + & c_1 & + & t_1 + & a_{16}P_6 \\ \cdot & & \cdot & & \cdot & & \cdot & \cdot \\ \cdot & & \cdot & & \cdot & & \cdot & \cdot \\ m_6 & + & l_6 & + & c_6 & - & (1-a_{66})P_6 \\ \cdot & & \cdot & & \cdot & & \cdot & \cdot \\ \cdot & & \cdot & & \cdot & & \cdot & \cdot \\ m_{124} & + & l_{124} & + & c_{124} & + & t_{124} + & a_{1246}P_6 \end{bmatrix}$$

Now consider the palm cooking price (P6) increased by 48.9% (therefore P6=1.489). The new price level (exogenous price) was calculated from the simulation. The exogenous costs and the exogenous price were grouped into four quadrants (Figure 4).
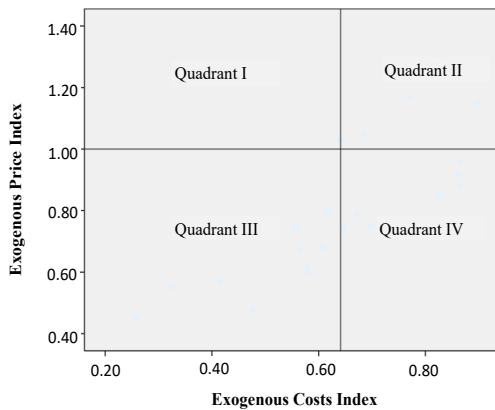

Figure 4. Schematic of the relationship between exogenous costs and exogenous price

The indicators of quadrants are as follows:
 a. Quadrant I-Low Exogenous Costs but High Exogeneous Price
 b. Quadrant II-High in Exogenous Costs and High in Exogenous Price.
 c. Quadrant III-Low in Exogenous Costs and Low in Exogenous Price.
 d. Quadrant IV-High in Exogenous Cost but High in Exogenous Price.

From this simulation, the estimated profit coefficient gained by every food industry was calculated based on the basic profit formula below:

$R = P \times C$	Equation (3)
$\pi = R \times C$	Equation (3a)
$\pi = (P \times Q) - (C \times Q)$	Equation (3b)
$\pi = (A - B)$	Equation (3c)

Where R is the Revenue, P is the Price, C is the Cost, π is the Profit Coefficient, A is the Exogenous Price, and B is the Exogenous Cost of Input.

Indirectly, this model can be used to analyse the impact on consumers.

Data Source
This study used the Malaysia input-output (I/O) table published by the Department of Statistics Malaysia (2010), Malaysian Palm Oil Berhad (MPOB, 2021) and Consumer Price Index, 2017 published by the Department of Statistics Malaysia and Productivity Report (2016/2017) published by Malaysia Productivity Corporation.

RESULTS AND DISCUSSION

Price Simulation

The price model is calculated using Equations 1(1b) and 2. Baseline costs presented in Column (1) were exogenous costs for four variables, namely imports, labour, value-added and taxes for the base year solution. Then, a new level of exogenous costs was obtained, as presented in Column (2). Column (3) shows the percentage of cost changes by comparing base year and exogenous costs. It was shown that the biggest cost changes came in restaurant and Dairy Production by 52.0% and 36.3%, respectively. It was then followed by the Preservation of Fruits and Vegetables (16.7%), Animal Feeds (15.4%) and Accommodation (11.5%). Meanwhile, the negative signs show a decline in primary input prices (costs), as shown in Table 1.

Table 1

Input-output Leontief price model for food production and services sector

Sector	Total Cost (Primary Input Price)			Total Impact Price		
	Cost of Input	Exogenous Cost of Input	% Change	Baseline price	Exogenous price	% Change
Column	(1)	(2)	(3)	(4)	(5)	(6)
1. Paddy	0.898	0.897	-0.1	1.00	1.15	14.9
2. Food Crops	0.867	0.865	-0.2	1.00	0.96	-4.2
3. Vegetables	0.827	0.825	-0.2	1.00	0.85	-14.8
4. Fruits	0.861	0.860	-0.1	1.00	0.92	-7.5
5. Oil palm	0.828	0.826	-0.2	1.00	1.30	29.6
6. Flower Plants	0.867	0.866	-0.1	1.00	0.88	-12.2
7. Other Agriculture	0.686	0.672	-2.1	1.00	0.79	-20.8
8. Poultry Farming	0.565	0.564	-0.2	1.00	0.67	-32.8
9. Other Livestock	0.610	0.607	-0.4	1.00	0.68	-32.1
10. Fishing	0.526	0.515	-2.2	1.00	0.76	-23.6
11. Meat and Meat Production	0.324	0.327	0.8	1.00	0.55	-45.3
12. Preservation of Seafood	0.254	0.258	1.8	1.00	0.45	-55.1
13. Preservation of Fruits and Vegetables	0.496	0.579	16.7	1.00	0.62	-38.1
14. Dairy Production	0.475	0.647	36.3	1.00	0.74	-25.9
15. Grain Mills	0.411	0.414	0.6	1.00	0.57	-42.7

Table 1 *(continue)*

Sector	Total Cost (Primary Input Price)			Total Impact Price		
	Cost of Input	Exogenous Cost of Input	% Change	Baseline price	Exogenous price	% Change
Column	(1)	(2)	(3)	(4)	(5)	(6)
16. Bakery Products	0.523	0.579	10.6	1.00	0.60	-40.0
17. Confectionery	0.665	0.684	2.9	1.00	1.05	5.0
18. Other Food Processing	0.569	0.616	8.3	1.00	0.80	-20.1
19. Animal Feeds	0.553	0.640	15.7	1.00	1.03	3.0
20. Wine and Spirit	0.711	0.697	-2.0	1.00	0.75	-25.1
21. Soft Drink	0.485	0.477	-1.5	1.00	0.48	-52.0
22. Accommodation	0.501	0.558	11.5	1.00	0.75	-25.4
23. Restaurants	0.507	0.770	52.0	1.00	1.17	17.4

Note. Calculated from Equation (1)- Equation (2)

Column (4) is the Baseline price or new level price = 1. A new level of exogenous price was obtained by assuming a 48.9% increase in palm cooking oil product prices. The highest price came from the oil palm sector and restaurants by 29.6% and 17.4%, respectively. The relationship between price and cost is shown in Figure 5.

High cooking palm oil prices can affect the producer's costs in two ways; the first is the direct effect of an increase in the price paid by producers for the consumption of palm oil product input. Meanwhile, in the second way, an indirect effect of using other sector inputs, the prices increased to offset their cost. This indirect effect can explain the cause of some products that are not related but still experience substantial effects in their cost of production, such as with restaurants. Sector 23 (restaurants) and Sector 19 (Animal Feeds) were laid on Quadrant I. Both sectors were high in price but low in cost. Sector 1 (Paddy), Sector 5 (Oil Palm), and Sector 17 (Confectionery) in Quadrant II were high in price and high in cost. Most sectors laid on Quadrant III were low in price and low in costs, such as Sector 8 (Poultry Farming), 9 (Other Livestock), 10 (Fishing), 11 (Meat and Meat Production), 12 (Preservation of Seafood), 13 (Preservation of Fruits and Vegetables), 14 (Dairy Production), 15 (Grain Mills), 16 (Bakery Products), 18 (Other Food Processing), 21 (Soft Drink), and 22 (Accommodation). However, Sector 2 (Food Crops), 3 (Vegetables), 4 (Fruits), 6 (Flower Plants), 7 (Other Agriculture), and 20 (Wine and Spirit) in Quadrant IV were low in price but high in costs.
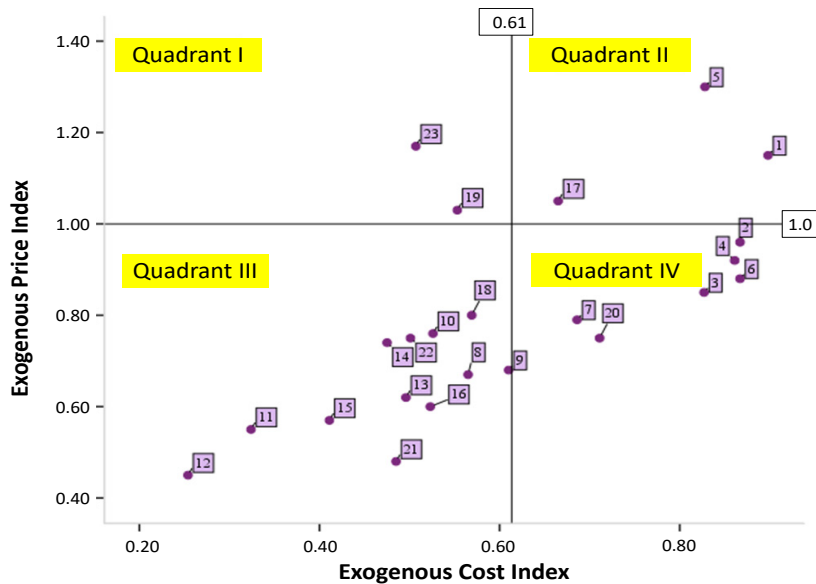
Figure 5. Relationship between exogenous cost and exogenous price (index)

In production theory, the producer aims to maximise profit and minimise the costs of raw materials. Due to the 48.9% increase in palm cooking oil prices, the cost of production would increase, immediately causing food producers to increase the price of food and services to gain maximum profit. Therefore, the food producer seems to pass the increase in production costs to the consumer to retain their profit. A similar finding was found in other studies on the effect of energy price increases on retail food prices (Hamid, 2011; Taghizadeh-Hesary, 2019). The higher the impact of an increase in the oil price, the more significant the increase in retail price. The highest profit gained by oil palm was 0.47, followed by restaurants at 0.40, Animal Feeds at 0.39 and Confectionary at 0.37. Preserved seafood and restaurants use many oil and fat products, mainly cooking oil, in their

production activities. Generally, most food industries gain profit due to an increase in the cost of input, as shown in Figure 6.

This indirect effect is called cost-push inflation. Cost-push inflation can create a detrimental multiplier effect on many products in the economy. As producers experience a price rise, the burden is passed to the consumers via higher prices. This price rise happens at different stages of production: manufacturing, retailing and distribution creating a continuous increase in the price trend. Increasing production costs at the manufacturing level will increase the wholesaler's and retailer's selling prices. Thus, to secure the margin along the supply chain, the actor will increase their selling price, and in the end, the consumer will probably absorb the production cost increment. When this happens to essential products like palm cooking oil, the impact
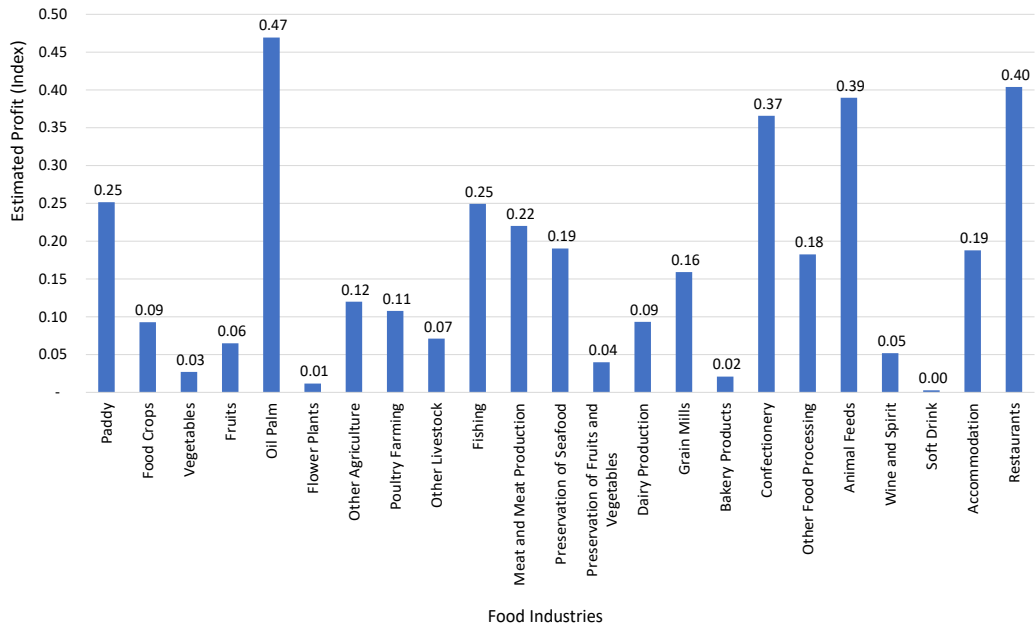
Figure 6. Estimated profit gain by food production

is intensely felt as all household-related economic activities need it, thus pushing inflation higher.

CONCLUSION

Palm cooking oil is a significant input in food manufacturers and food-away-from-home services such as restaurants, hotels, and food stalls. The subsidy withdrawal of palm cooking oil increases the price of cooking oil by 48.9%. Therefore, this study uses the Leontief price modelling technique to examine the impact of increased palm cooking oil market prices on food manufacturers and consumers. The findings show that both price and production costs were changed during the simulation and directly and indirectly impacted food producers and consumers.

From the consumers' perspective, the direct impact happens when they buy and consume cooking oil directly in their home kitchen. Previous study reported that low-income consumers (B40) spent only 2% of their expenditure on food, regardless of the consumer's location, either in urban or rural areas. These B40 consumers are less affected as they can still enjoy the subsidy provided by the government through a 1 kg packet of cooking oil. In addition, B40 consumers were entitled to get *Bantuan Rakyat 1 Malaysia* (BRIM) (now known as *Bantuan Prihatin Nasional* (BPN)) in the previous government, and 64.7% of households in the B40 category only depend on one source of income. The M40 and T20 consumers are not entitled to receive BRIM or *Bantuan Sara Hidup* (BSH) because

their income level is above RM4,000 per month. High living costs from the direct and indirect prices of palm cooking oil and petrol affected M40 consumers. Consumers are remarkably suppressed with an indirect effect when they spend their income on food away from home.

From the producer's perspective, food production costs are increased due to input costs, such as palm cooking oil. However, food producers like restaurants, hotels, food processing, and Confectionary should not significantly increase their prices as it would drive more customers away. In the context of small food producers like *nasi lemak* stalls, fried banana stalls, and noodles stalls, the burden of the higher price of palm cooking oil gives them two options: either gain a breakeven profit or suffer a total loss. Consumers are expected to avoid food away from home and will prepare their food at home. Furthermore, consumers are expected to stock up on their cooking oil during a price promotion. However, with a time constraint, consumers in urban areas will probably prefer to choose a food-away-from-home. Thus, food producers will also take this opportunity to pass the burden of increasing production costs, such as petrol and cooking oil prices, onto consumers by increasing the price of goods and services. This situation is supported by the estimated profit finding that all food producers gained a profit despite a price increase. From a policy implication perspective, the government should revise the price of palm cooking oil. The fluctuation in palm oil prices impacts the market price of palm cooking oil. If the government does not revise cooking oil prices, it will affect consumers and food manufacturers, mainly small-scale food producers.

ACKNOWLEDGEMENTS

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SOCIAL SCIENCES & HUMANITIES

PERTANIKA JOURNALS

Factors Influencing Teaching Higher-order Thinking Skills Among Mathematics Teachers in Malaysian Primary Schools

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ABSTRACT

Integrating higher-order thinking skills (HOTS) into the mathematics curriculum has been a longstanding goal of the Malaysian education system. By recognizing its growing importance in enhancing students' thinking abilities, this study explores the factors influencing the teaching of HOTS in primary schools across Malaysia. A quantitative research approach is used to analyze 269 randomly selected mathematics teachers from primary schools in Temerloh, Malaysia, to investigate the impact of four influencing factors: teachers' knowledge of HOTS, pedagogical skills, attitude, and barriers to teaching HOTS. The findings from this study revealed that all four influencing factors significantly predict the teaching of HOTS among Malaysian mathematics teachers. These results hold significant promise in enriching teaching practices and fostering HOTS integration within the school context. By providing valuable insights into the dynamics of teaching HOTS, this study aims to equip teachers, schools, and administrators with essential resources to enhance students' academic achievements. The implications of this research are far-reaching and hold the potential to revolutionize the learning and teaching landscape in Malaysia, not only in mathematics but also in other disciplines, thereby elevating the overall learning experience.

INTRODUCTION

Higher-order thinking skills (HOTS) encompass a range of cognitive abilities, such as problem-solving, reflection, value reasoning, innovation, and decision-

making, as defined by the Ministry of Education (2013). These skills have become increasingly critical in the fast-paced information era, as they empower individuals to address global competition effectively and identify connections between various concepts, thereby enhancing problem-solving efficiency. Particularly for young learners, including students, cultivating HOTS is integral to their education, enabling them to tackle novel problems, uncertainties, questions, or dilemmas. The practice of HOTS aids in overcoming challenges associated with generating innovative ideas and can be activated when students encounter unfamiliar situations. As a result, mathematics teachers play a crucial role in fostering HOTS by exploring pedagogical skills, attitudes, knowledge, and potential obstacles to teaching HOTS.

Within mathematics education, the development of HOTS holds intrinsic importance. These skills enable students to engage in abstract language functions, such as expressing and defending ideas, speculating, and hypothesizing, which are vital components in learning and applying mathematics (Rahmawati et al., 2019). Furthermore, HOTS involves the acquisition of complex judgmental skills, including critical thinking and problem-solving, which are essential for students studying mathematics. The HOTS model, as proposed by Saragih et al. (2017), comprises three key components: meta-components, performance components, and knowledge acquisition components. By teaching HOTS to students, as emphasized by Sa'dijah et al.

(2021), educators can equip them with the necessary preparation to tackle challenging academic tasks, future work roles, and responsibilities. Consequently, HOTS has the potential to serve as a predictive indicator of students' academic success.

Despite its significance, there is a paucity of literature on the teaching of HOTS and the factors influencing its implementation among mathematics teachers. Comprehensive studies in this area are limited. As primary school mathematics teachers evaluate their instructional practices, they may be prompted to shift their focus towards emphasizing HOTS goals in line with traditional teaching approaches. Contemporary methods, often teacher-centered and catering to large passive classes, have been less inclined to involve students in understanding the purpose of learning or the expected outcomes, owing to a prevalent emphasis on examination-oriented teaching (Eastman & Studd, 2020). Hence, the present study seeks to explore the factors influencing the teaching of HOTS in the mathematics classroom. This investigation encompasses an examination of mathematics teachers' knowledge of HOTS, pedagogical skills, attitudes, as well as any potential barriers to the effective teaching of HOTS.

Current Study

Malaysia has been dedicated to elevating the standards of science and mathematics education to foster global competitiveness among its students. The Malaysia Education Development Plan (PPPM) 2013–2025

emphasizes the significance of HOTS in shaping competent individuals capable of critical and creative thinking, preparing them for global competition. In pursuit of this objective, the Ministry of Education has undertaken various initiatives to cultivate students' HOTS. An example of such efforts is the collaborative effort between the Ministry of Education and Agensi Inovasi Malaysia (AIM) in developing the i-THINK program, which aims to instill HOTS in schools and foster a culture of lifelong learning among students (Hamzah & Wan Yusoff, 2021). The primary aim of this study is to nurture creative and innovative students and teachers who possess the ability to solve intricate problems. Eight thinking tools were employed by students and teachers to incorporate HOTS into the teaching and learning processes, thereby equipping them with higher-order abilities, including creative and critical thinking skills.

Despite these endeavors, Malaysia's performance in international mathematics exams has exhibited a significant decline, as noted by Mullis et al. (2012). This decline has occurred despite significant changes in the mathematics curriculum over the years, such as the implementation of the Modern Mathematics Program (MMP), the New Curriculum for Primary School (KBSR), the Integrated Curriculum for Secondary School (KBSM), and the Teaching and Learning of Mathematics in English (PPSMI). The ongoing problem of ineffectiveness in teaching HOTS in schools persists, even with the attention given to HOTS in Malaysia's curriculum.

However, it is crucial to recognize that figures alone provide a limited perspective on student performance, and the quality of education necessitates examining other critical aspects. It is evident that students who do not possess core intellectual skills, such as HOTS, will face challenges in succeeding in a rapidly evolving economy (Ibrahim & Harun, 2017). In Malaysian primary schools, traditional teacher-centered models emphasizing information sources, algorithms, and drills continue to be employed (Meldawati et al., 2020). Teachers often perceive their primary role as information providers, leading to a high inclination toward implementing teacher-centered learning in their classrooms (Muganga & Ssenkusu, 2019). Consequently, this approach may result in lower student participation, increased reliance on memorization, and a dearth of HOTS among Malaysian students. Additionally, Malaysian teachers may lag in questioning skills and techniques that promote HOTS (Yusoff & Selman, 2018).

In light of these findings, it is evident that despite efforts to emphasize HOTS in education, there remain challenges and gaps in effectively implementing and fostering these critical thinking skills among students in Malaysia. Addressing these issues is crucial for enhancing the overall quality of education and preparing students for success in a dynamic and competitive global landscape.

Literature Review
Higher-order Thinking Skills (HOTS) among Mathematics Teachers. In modern

education, developing critical thinking and problem-solving skills is crucial for students to thrive in an ever-changing world. Mathematics, as a fundamental subject, plays a vital role in nurturing HOTS among students. The concept of HOTS originates from Bloom's (1956) cognitive domain taxonomy, encompassing reasoning, logical thinking, and critical thinking abilities essential for daily life and academic success (Hadi et al., 2018). HOTS can be seen as a complex and advanced form of skill involving the interpretation and application of knowledge (Arip et al., 2018), which develops after students have acquired basic foundational knowledge, distinguishing it from lower-order learning characterized by rote memorization and lack of reasoning (Kacmaz & Dubé, 2021).

Effective mathematics educators employ various pedagogical strategies such as problem-based learning, inquiry-based approaches, collaborative activities, and open-ended tasks to stimulate critical thinking and creativity among their students (Sebatana & Dudu, 2022). However, despite the importance of promoting HOTS, teachers face challenges like large class sizes, time constraints, standardized testing pressures, and the need to cover a broad curriculum. Moreover, some teachers may lack adequate professional development opportunities to enhance their understanding and application of HOTS in mathematics education (Ghanizadeh et al., 2020).

To equip mathematics teachers with the necessary skills and knowledge to effectively promote HOTS, comprehensive training and ongoing professional development are essential. Specialized training programs can have a significant impact on teacher practices and student outcomes. Creating a supportive environment where teachers can share experiences and best practices related to HOTS is also crucial. Research suggests that students exposed to a learning environment emphasizing HOTS tend to achieve better academic outcomes (Lu et al., 2021). Continuous professional development and support from educational institutions are vital to empower teachers to elevate the quality of mathematics education and equip students with the skills needed to thrive in a dynamic and competitive world. Ultimately, this research emphasizes the imperative role teachers play in shaping the minds of young learners and fostering a society that values critical thinking and problem-solving. The present study explores the factors influencing the teaching of HOTS in the mathematics classroom.

Factors Influencing Teachers Teaching HOTS in Mathematics Classrooms

This study focuses on four main factors influencing teachers' approach to teaching HOTS in the mathematics classroom: Teachers' knowledge of HOTS, pedagogical skills, attitudes toward HOTS, and Barriers to HOTS teaching. Previous literature, such as the work of Aliakbari and Sadeghdaghighi (2013), has already explored key factors that impact teachers in teaching HOTS. The first two elements under study are teachers' pedagogical knowledge of HOTS and their attitude toward teaching HOTS. Utami et

al. (2019) have found that teachers with better attitudes and beliefs about HOTS experience greater success in implementing it. To effectively organize a HOTS-oriented curriculum, teachers must understand the approaches, tactics, and procedures to instruct students about HOTS (Bartell, 2013). Moreover, Retnawati et al. (2017) have reported that teachers' understanding of teaching HOTS has a beneficial influence.

Research conducted by Sevian et al. (2018) highlights that students also support teacher professional development in HOTS. The pedagogy literature by Baguma et al. (2019) contributes to developing thinking skills. Additionally, Anderson and Taner (2022) point out the importance of HOTS-related pedagogical skills for effectively engaging low-advantage learners. Similarly, Singh and Marappan (2020) emphasize the significant impact of teachers' pedagogical skills in using HOTS activities, regardless of students' learning capabilities. Another critical factor is the correlation between teachers' perceptions and knowledge about teaching HOTS and their practices (Rachmawaty & Ariani, 2019). Teachers' willingness to prioritize teaching HOTS is strongly influenced by their belief that such thinking abilities improve students' academic performance and decision-making skills and inspire them to think beyond conventional boundaries (Seif, 2017). Studies investigating teachers' attitudes toward HOTS and their perceptions of students' advantage levels have suggested that some teachers might consider HOTS activities ineffective for low-advantage

learners, leading to a preference for lower-level HOT activities (Ardila, 2020; Jannah, 2018). The third factor affecting HOTS teaching is the pedagogical skills of teachers. Research by Lawson et al. (2019) reveals a severe lack of skills and preparation to teach HOTS in schools. An efficient understanding of HOTS knowledge and pedagogical abilities is crucial for organizing and enhancing HOTS, making it a requirement for 21st-century teachers (Seman et al., 2017).

The final factor explored in this study is the barriers to HOTS teaching. Teacher-related barriers encompass uncertainty about how to teach HOTS, the misconception that HOTS is only suitable for high-performing students, limited time for higher-level thinking, assessments not testing critical thinking skills, and discomfort in asking open-ended questions. Additionally, mathematics teachers face difficulties, such as developing HOTS-based problems and finding suitable learning tools, as well as evaluating students' HOTS abilities (Jailani & Retnawati, 2016; Retnawati et al., 2017). The student-related barrier arises from some students' preference for easy solutions over engaging in rigorous critical thinking (Niemi & Kousa, 2020). Lack of interest in the subject, resistance to higher-level thinking, insufficient background knowledge, limited experience in HOTS development, and impatience with higher-level thinking also contribute to student-related barriers (Wilson & Narasuman, 2020). Based on the findings, the study proposes the following hypotheses:

Hypothesis 1: Teachers' knowledge of HOTS significantly impacts the teaching of HOTS in the mathematics classroom.

Hypothesis 2: Teachers' pedagogical skills significantly impact the teaching of HOTS in the mathematics classroom.

Hypothesis 3: Teachers' attitudes toward HOTS significantly impact the teaching of HOTS in the mathematics classroom.

Hypothesis 4: Barriers have a significant negative impact on the teaching of HOTS in the mathematics classroom.

Figure 1 depicts the conceptual model illustrating the relationship between the independent variables and the teaching of HOTS.
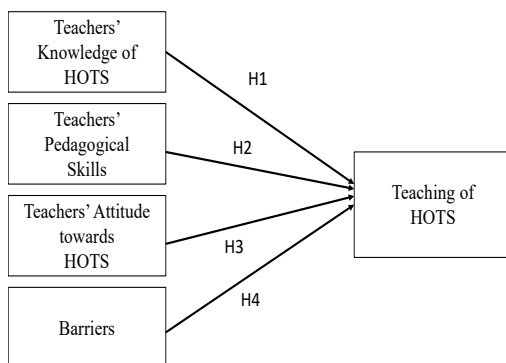
Figure 1. Conceptual framework

METHODOLOGY

Research Design

This quantitative research study has been carried out to test the proposed research framework. According to Cohen et al. (2002), the quantitative approach is a research method that is powerful and suitable for large and small-scale research such as experiments, case studies, correlational research, and action research. In this study, a correlational research design was used. A correlational research design was chosen because no manipulation of the variables was involved in this study (Bloomfield & Fisher, 2019), and it was carried out to obtain information on the present scenario of teaching HOTS in mathematics classrooms among mathematics teachers.

Participants and Procedures

This study focuses on primary school mathematics teachers, intending to encourage them to prioritize HOTS when evaluating their instructional techniques. The rationale behind this research stems from the observation that traditional teacher-centered methods, which often emphasize exam preparation, can hinder student engagement and comprehension of the reasons and outcomes of learning in contemporary mathematics education. The accessible population for this study includes all mathematics teachers in the Temerloh district, which was selected as the study region due to its predominantly remote and rural schools. Primary school students in this area have been observed to lag behind their peers in terms of HOTS attainment compared to nearby districts.

To ensure the data collected is representative and generalizable, the researchers adopted a stratified random sampling approach. They divided the Temerloh district into four zones: Kuala

Krau, Temerloh, Lanchang, and Mentakab. From each zone, two primary schools-one urban (Temerloh and Mentakab) and one rural (Kuala Krau and Lanchang) were chosen. A random sample of approximately 296 mathematics teachers was then selected from each of the eight chosen primary schools. By using stratified random sampling, the study aims to capture insights and experiences from both urban and rural contexts, providing a comprehensive understanding of the factors influencing the teaching of HOTS among current primary school mathematics teachers in the Temerloh district. The research also seeks to define the factors influencing HOTS in mathematics teaching. For measuring continuous data, the researchers primarily utilized a five-point Likert scale. To determine the appropriate sample size when using the continuous scale for data collection, they followed Cochran's

formula, as recommended by Bartlett et al. (2001). Consequently, 269 math teachers were chosen for the study.

A flow of procedures leading to data collection was prepared to achieve this goal. Firstly, the researcher obtained the necessary approval from the Temerloh District Education Office (PPDT) to acquire the total number of mathematics teachers in primary schools. These mathematics teachers have been assured that their responses are kept confidential. Finally, the completed questionnaires were collected by the researcher. Of the 350 randomly distributed questionnaires, 332 mathematics teachers finished the surveys. The overall sample size, 269 (M Age = 25.12, SD = 1.73), as shown in Table 1, represents a response rate of 76.85% due to missing data. It aligns with what has been suggested in earlier work (Hair et al., 2010).

Table 1
Respondents' demographic profile (n = 269)

Demographic information	f	%	M	SD
Age			25.12	1.73
Below 25	5	1.86%		
25–35	109	40.52%		
36–45	89	33.09%		
46–55	61	22.67%		
Over 55	5	1.86%		
Gender				
Male	81	30.11%		
Female	188	69.89%		
Schools				
Malay medium national school	189	70.26%		

Table 1 *(continue)*

Demographic information	f	%	M	SD
Chinese medium national school	38	14.13%		
Tamil medium national school	42	15.61%		
Degree Level				
Diploma	87	32.34%		
Degree	156	57.99%		
Master	26	9.67%		

Measures

Teachers' Views on Knowledge of HOTS. The ten-item scale used in this study was adopted from Rajendran's (2001) instrument to measure the view toward knowledge of HOTS among mathematic teachers using a 5-point Likert scale: (1) Strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, and (5) Strongly agree. An example of the questions in this segment is: "I know details of the curriculum for teaching HOTS". The Cronbach's α for the measurement is .98.

Teachers' Views on Pedagogical Skill. Again, Rajendran's (2001) instrument was used. All nine items were tallied according to the response format of the 5-point Likert scale, with values ranging from 1 (Completely Disagree) to 5 (Completely Agree). To obtain the responses, an example of the questions asked is: "I can plan a lesson to teach HOTS". The acquired Cronbach's alpha value for the measurement is .94, higher than the accepted Cronbach's α value of 0.7.

Teachers' Attitude Toward Teaching HOTS. Eleven items were used in this study, as they have previously been tested by many researchers (Rajendran, 2001). The 5-point Likert scale used for this segment ranges from 1 (Completely Disagree) to 5 (Completely Agree). An example of the questions asked is: "I find a great deal of satisfaction in teaching HOTS". The acquired Cronbach's α score for innovation measurement is .90.

Barriers of Hots. This discussion was adopted from Ozkan-Akan's (2003) instrument that measures the barriers to HOTS. All 45 items (with three components, which are teacher-related barriers (16 items), students-related barriers (15 items), and external-related barriers (14 items)) were measured according to the response format of the 5-point Likert scale, with values ranging from 1 (Completely Disagree) to 5 (Completely Agree). An example of the types of questions asked is: "Teachers usually use teaching strategy in mathematics class". The acquired Cronbach's α value for the measurement is .95.

A panel of three experts was selected based on their knowledge of mathematics education to guarantee the instrument's content validity for this study. They were lecturers at Universiti Pendidikan Sultan Idris (UPSI) and Universiti Sains Malaysia (USM). After completing the content validity process, the questionnaire was retained for the reliability pilot test. Before the pilot test, during the validation stage, the questionnaire was modified because of the feedback from the expert panel. A total of 20 math teachers from the Temerloh district participated in the pilot test for this study to assess their views on the instrument's clarity and reliability. The Cronbach's α coefficient for this study ranged from .86 to .92.

DATA ANALYSIS

The Social Science Statistical Package (SPSS) Version 26.0 was utilized to analyze all the data gathered for this study. Descriptive and inferential statistics were also utilized. To ensure that the assumptions of normality, linearity, and multicollinearity were not violated, preliminary data assays were carried out. The five constructs were described using means and standard deviations. The association between the independent components and the teaching of HOTS was determined using linear correlation coefficients to match the research's goals. As this study used inferential statistics, multiple linear regression analyses were performed. The link between two or more independent variables and one dependent variable is estimated using multiple linear

regression (Radhy, 2019). Researchers can use multiple regression analysis to assess the strength of the relationship between an outcome (the dependent variable) and several predictor variables, as well as the importance of each predictor to the relationship, often with the effect of other predictors statistically eliminated (Black & Babin, 2019). Finally, hypothesis testing was performed to determine the validity of the proposed hypotheses.

RESULTS

Descriptive Analysis

The purpose of the study's initial hypothesis is to establish the correlation, or relationship, between the independent variables and HOTS instruction. The findings depict a significant positive association between teachers' knowledge of HOTS and the teaching of HOTS in the mathematics classroom (r (269) =.50, $p < .000$). This finding reveals a moderate to significant association between teachers' pedagogical skills and teaching HOTS in the mathematics classroom ($r = .643$, N = 269, $p < 0.00$). Moreover, the study findings also show a significant correlation between teachers' attitudes and teaching HOTS (r (269) = .54, $p < .001$). Finally, the results show a weak but significant correlation between HOTS-related barriers and teaching HOTS (r (269) = .31, $p < .001$), as shown in Table 2.

Multiple Linear Regression

Multiple linear regression (MLR) analysis was conducted to investigate the impact of independent factors on teaching HOTS

Table 2
Means and standard deviations, correlations among study variables

No.	Variables	M	SD	1	2	3	4	5
1	KN	3.91	0.57	1				
2	PS	4.13	0.62	0.62^{**}	1			
3	AT	4.09	0.64	0.37^{**}	0.538**	1		
4	BA	2.07	0.50	0.70^{**}	0.819**	0.49^{**}	1	
5	TH	3.07	0.68	0.50^{**}	0.643**	0.54^{**}	0.31^{**}	1

Note. Teachers' knowledge of HOTS = KN, Teachers' pedagogical skills, Teachers' attitude toward HOTS = AT, Barriers = BA, Teaching of HOTS = TH. $^{**}p < 0.01$, two-tailed.

in the Malaysian setting. The findings show that supervisory styles significantly contribute to the supervisory satisfaction of the respondents F (4,264) = 21.816, $p < 0.0001$, as shown in Table 3. The equation based on the prediction model is as follows:

$$Y_1 = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \varepsilon$$
$$Y(TH) = -1.067 + 0.394 \ (KN) + 0.344 \ (PS) + (0.196) \ (AT) + 0.375 \ (BA) + \varepsilon$$

MLR analysis was used to evaluate the predictability of teaching HOTS among mathematics teachers using the study's independent variables. These factors strongly predict instruction among Malaysian math teachers. The most positive and statistically significant predictor is barriers, with $\beta = .323$, $p < .001$. To sum up, these findings offer statistical evidence for approving H_1 to H_3. The results also show that the predictor variables explain up to 24.8% of the variance in the predictability of independent variables, while the remaining 75.2% may be attributed to other factors that are not within the scope of this study.

Table 3
Multiple regression analysis results

Paths	β	t	P	Decision
KN→ TH	0.370	4.896	0.000	H_1: Accepted
PS→ TH	0.371	3.817	0.000	H_2: Accepted
AT→ TH	0.130	2.043	0.042	H_3: Accepted
BA→ TH	0.323	3.131	0.002	H_4: Accepted

Note. Teachers' knowledge of HOTS = KN, Teachers' pedagogical skills, Teachers' attitude toward HOTS = AT, Barriers = BA, Teaching of HOTS =TH.

DISCUSSION

The present study makes a substantial contribution to the existing knowledge about the factors influencing the teaching of HOTS among mathematics teachers in the Temerloh district of Malaysia. Through a comprehensive investigation that encompasses teachers' attitudes,

knowledge, pedagogical skills, and barriers to HOTS instruction, this research provides critical insights into the dynamics of HOTS implementation within this specific context. The proposed conceptual framework (Figure 1) effectively elucidates the factors under examination, highlighting their significance in shaping the integration of HOTS.

The findings demonstrate that mathematics teachers in the Temerloh district possess a positive attitude toward teaching HOTS, which aligns with a prior study by Johnson et al. (2020) conducted in the United States. The research by Johnson et al. (2020) revealed that teachers with positive attitudes toward HOTS integration were more inclined to incorporate engaging and challenging activities that fostered higher-level thinking in their mathematics classrooms. Additionally, Khonamri et al. (2021) emphasized the widespread presence of positive attitudes among teachers, underscoring the crucial role of educators in creating a supportive learning environment that fosters the growth of HOTS.

Furthermore, the study identifies teachers' perceptions of their pedagogical skills and knowledge as the most significant predictors of HOTS implementation in the mathematics classroom. This finding is consistent with the emphasis placed by Wilson and Narasuman (2020) on the importance of pedagogical skills in effectively integrating HOTS. These results highlight the global significance of providing teachers with effective pedagogical training to enhance HOTS among students. The research by Chong et al. (2022) in

Hong Kong also aligns with the present study, showing that teachers' knowledge of HOTS and their pedagogical skills significantly influenced students' critical thinking abilities. Similarly, educators who possessed a deeper understanding of HOTS concepts and utilized student-centered teaching approaches were more successful in fostering HOTS development among their students.

Regarding barriers to HOTS instruction, the results indicate that these obstacles have a significant negative impact on teaching HOTS in the mathematics classroom. This finding resonates with a previous study by Livy et al. (2023) in Australia, which examined barriers to implementing HOTS in primary school education. The review identified factors such as limited resources, time constraints, and lack of professional development opportunities as common obstacles. While these findings may seem initially contradictory to previous studies by Torff and Sessions (2006), which suggest that barriers hinder HOTS instruction, Makki et al. (2018) argue that these challenges can be overcome through positive influences, such as capability development opportunities, administrative support, freedom to experiment with new ideas, and mentorship. This perspective underscores the importance of proactively addressing barriers and highlights the significance of supportive measures in fostering effective HOTS implementation.

The current study's findings are critically compared to previous research conducted both domestically and internationally,

making a significant contribution to the literature on HOTS implementation. Teachers' positive attitudes, effective pedagogical skills, and sound knowledge of HOTS emerge as key determinants influencing the successful integration of HOTS in the mathematics classroom. Additionally, the research emphasizes the potential for addressing barriers through proactive measures and support. These insights have broader implications for promoting HOTS not only in Malaysia but also in educational contexts worldwide. By incorporating diverse perspectives and situating the findings within a broader framework of effective HOTS instruction, this study enhances the understanding of HOTS implementation in various educational settings globally.

CONCLUSION

In conclusion, the primary objective of this study was to investigate the influence of teachers' knowledge, pedagogical skills, and attitudes towards HOTS. The findings robustly demonstrated the substantial impact of these factors on the effective teaching of HOTS within the cohort of Malaysian mathematics educators. These findings carry significant potential to enhance teaching methodologies and facilitate the seamless integration of HOTS principles across educational institutions. Furthermore, the implications of this study transcend its immediate scope and resonate deeply within the broader educational landscape of Malaysia. This resonance is particularly pronounced in subjects such as mathematics,

where the deliberate promotion of HOTS is intrinsically linked to the cultivation of superior learning outcomes. Notably, the insight gained into the challenges students face when introduced to HOTS-enriched teaching methodologies holds the promise of fostering a mutually beneficial learning environment.

Implications

By building upon these outcomes, future research endeavors should be channeled toward understanding how prospective educators assimilate HOTS into their pedagogical strategies. The study's underpinning theoretical framework, bolstered by the three discerned factors—namely teachers' self-perception of HOTS knowledge, teaching skills, and attitude—serves as a compass for illuminating the dynamics of HOTS instruction, particularly within the context of mathematics education in the Temerloh district. Lastly, a critical pathway for future exploration lies in an in-depth investigation of the diverse impediments to effective HOTS instruction across varying educational contexts, as well as their consequential impacts on instructional practices. Such an undertaking is pivotal to garnering a holistic comprehension of these challenges and their ripple effects. In a succinct synthesis, this study not only bridges existing knowledge gaps but also lays the groundwork for refining pedagogy and elevating the quality of education. It is an inspiring call to collective action, propelling HOTS integration to unprecedented heights and

nurturing a generation of analytical thinkers equipped to navigate the complexities of an ever-evolving world.

Limitations and Direction for Future Studies

The study has several limitations that need to be acknowledged. Firstly, the data for this research were obtained solely from 71 schools in the Temerloh area, with the participants being limited to mathematics teachers. As a result, the generalizability of the study's findings to all mathematics teachers across different regions may be questionable, especially considering the scarcity of studies focused on primary schools. Additionally, selecting respondents from the Temerloh district introduces potential bias, as the district is known for having a higher proportion of rural schools. It could impact the applicability of the findings to more urban or diverse settings.

Another limitation is the research design employed, which is a correlational research design. Since this design does not involve the manipulation of variables, it restricts the scope of understanding causal relationships between the factors studied. The focus was gathering information about the current state of barriers to teaching HOTS, teachers' attitudes toward teaching HOTS, their knowledge, and confidence levels in HOTS instruction. For future studies, it would be beneficial to adopt more comprehensive and in-depth research methods when investigating HOTS instruction in primary schools. Qualitative methods like interviews, classroom observations, and recordings could provide richer insights into teachers' experiences and challenges in implementing HOTS. Longitudinal studies tracking the variables over an extended period could also offer a more nuanced understanding of the dynamics of teaching HOTS effectively.

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Intersection of Gender, Globalization, and Religion in Local and Globalized ELT Textbooks in Iran

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ABSTRACT

This paper examines gender representation in two textbook series: Solutions, published by an international publisher, and the Iran Language Institute (ILI) series, written by local writers. Evidence of gender representation is drawn from the analysis of their religious content in the narrative texts and the illustrations. The analysis of gender representation is guided by six criteria: visibility in pictures, visibility in text, firstness, character activity, occupations, and topic dominance. The findings indicate that in both textbook series, males exhibit greater visibility and dominance in relation to character and occupation. The gender representation varies significantly. These results substantiate previous investigations conducted elsewhere, highlighting the gender imbalance in textbook representation. The examination of gender representation at the intersection of religion in local textbooks also revealed that intersectionality in social sciences can further perpetuate gender bias in educational materials. These findings serve as a call to action for textbook authors and education policymakers to prioritize gender equality representation within the context of religion and globalization in language education textbooks authored by local writers. This research holds implications for language teaching approaches fostering intercultural competence, specifically in English as a lingua franca.

Keywords: Gender, global materials, local materials, materials development, TEFL

INTRODUCTION

The teaching and learning of English have gained momentum as many people worldwide seek to learn the language for general, academic, and/or professional purposes. Textbooks tend to serve as the intended curriculum in EFL contexts and constitute one of the salient constituents of ELT as a global enterprise, raising awareness in learners about the culture and values of the target language. Although globalization in education has been identified as an important area of research, gender representation in globalized education remains under-researched.

Considering the psychological aspects of gender and identity, there is still room for advancing progressive feminist ideas by means of textbooks, which have the potential to influence the way learners perceive gender roles and contribute to the process of gender socialization at school. It is, therefore, extremely important to analyze textbooks from different perspectives to gain a more comprehensive view of the hidden curriculum reflected in such materials (Hassaskhah & Abdollahi, 2021). Many content and linguistic analyses of educational materials (e.g., Ghajarieh & Salami, 2016; Hamdan, 2010; Nakhostin & Alimorad, 2022; Rakati et al., 2022) have focused on gender representation and the extent to which it is reflected in textbook textual and visual content.

Blumberg (2008) highlights the salience of gender representation in the hidden curriculum and maintains that the curriculum is an important medium for gender socialization in educational settings. Social beliefs and cultural norms reflected in language are constitutive elements of gender, which explains why they are consequential for younger students in education. Visual content in textbooks can affect, if not shape, the minds of young students regarding gender norms.

The present study undertakes a comparative investigation into gender representation in global textbooks selected from the Solutions series and the local textbooks selected from the ILI series at the pre-intermediate level. Numerous academic studies on gender representation in education have been conducted, but many have approached the topic from a Western perspective without explicitly considering the intersection of gender, religion, and globalization. Researchers such as Agni et al. (2020), Ghajarieh and Salami (2016), and Hassaskhah and Abdollahi (2021) have explored this area without deeply examining the influence of religion on gender representation. Additional studies are needed to investigate in detail the representation of gender and take into account the religious and cultural mores of societies, which are the determining factors in gender stereotypes and bias. This study aims to provide empirical evidence on gender and the intersection of gender with religion and globalization in the context of education in Iran as an Islamic country.

Research incorporating Islamic literature in language classrooms, exemplified by Irwansyah et al. (2021), can offer a well-rounded viewpoint on the role of religion

in education. This study follows the current trend of research exploring religion in education, seeking to remain unbiased and inclusive of different religious beliefs. An important dimension of this study is to ascertain whether Iranian women using local versus global textbooks are discriminated against with respect to gender, globalization, and religion. While many studies have investigated the role of gender in school textbooks, the intersection of gender and globalization in this epistemological site needs to be explored in view of the paucity of empirical evidence. Likewise, the intersection of gender with other factors such as religion, race, and identity is also an under-researched area.

The intersection of gender and globalization is a complex concept that requires further clarification to understand the specific relationship between them. Intersectionality, introduced by Crenshaw (1989), investigates how social categorizations such as gender, race, and class overlap and shape people's societal experiences. Globalization involves the multifaceted processes of global interconnectedness in terms of economy, politics, and social issues. The present intersectional inquiry delves into understanding how gender-related issues are influenced by and contribute to globalization, such as how global economic systems that fund globalized textbooks may perpetuate gender inequality and how gender biases in society affect the content of such textbooks. In the case of local textbooks, it is expected that such educational materials prescribed by the education ministries of different countries reflect gender biases existing in what Ulum and Köksal (2019) describe as "the source society or state" (p. 72). To address this perplexing intersection, the study on gender representation in localized and globalized textbooks used in a private institute in Iran investigates how gender is portrayed in educational materials at the intersection of religion, globalization, and localization.

The present study accordingly addresses these research questions:

RQ1: How is gender represented in the ILI textbooks written by Iranian writers and in the Solutions textbooks published by an international publisher?

RQ2: How is the intersection of gender and religion represented in the narrative text (linear form) and the illustrations (non-linear form) in the local and globalized textbooks?

Literature Review

Gender bias and stereotypes are shaped and reproduced through language (Menegatti & Rubini, 2017). In this context, critical discourse analysis represents an important area of linguistics in recognizing the constitutive role of language in shaping such beliefs and bias, and a considerable number of studies have explored the construction of gender in textbooks and other epistemological sites. These studies extend from the 1990s (e.g., Rifkin, 1998) to more recent years (e.g., Lee, 2018; Rakati et al., 2022) and focus on ascertaining

the criteria to assess the equity of gender representation in textbooks and on the representation of gender as found in various corpus studies. Different tools of analysis were used, including Critical Discourse Analysis (Sulaimani & Elyas, 2018) and corpus linguistics tools (Lee, 2018).

Textbooks and other resources improve students' ability to learn. EFL/ESL textbooks focus on developing the four language skills and play a crucial role in language teaching and learning. Materials developers have to deal with a number of criteria for creating textbooks to cater to the needs of students (Ghajarieh et al., 2023). Choosing and evaluating appropriate textbooks is a complex matter, and most institutions choose textbooks according to what publishers offer and make available.

Numerous studies highlight gender disparities in textbooks. Lee and Collins (2006) found persistent gender stereotyping in Hong Kong EFL textbooks. Lee (2018) explored gender representation in Japanese EFL textbooks, revealing ongoing gender biases despite government initiatives and advancements for women. Variations in the portrayal of women and men in the fields of numeric balance and gender stereotyping have been identified in different series of textbooks. A recent study in the Iranian context undertaken by Lee and Mahmoudi-Gahrouei (2020) analyzed "English for School Series, Prospect," which was recently prescribed by the Iranian Ministry of Education. The study found "some gender consciousness" with "low female visibility" (p. 1107). Recent gender studies

have explored the intersection of gender with other social factors. A study by Cheng and Beigi (2012) analyzed Iranian EFL textbooks and found that they predominantly focused on religious and cultural activities, highlighting the intertwining of gender, religion, and education in this context.

In a study by Sulaimani and Elyas (2018), the intersection between globalization and education was examined through a global series used in Saudi Arabia. The study recommended a glocalized edition. Ulum and Köksal (2019) further explored this under-researched field and found that EFL textbooks, both globally and locally created, heavily reflect the ideology and hegemony of inner and expanding circle cultures. A scholarly investigation into gender representation in English educational textbooks indicates that this topic can be examined within the context of religion and globalization. The textbook representation of gender is influenced by cultural and religious beliefs, as well as worldwide trends and values. By examining gender representation in locally developed textbooks at the intersection of religion and globalization, one can identify and address biases and stereotypes while advocating more inclusive and diverse gender portrayals. Additionally, this analysis can raise the awareness of educators and students regarding intercultural concepts in foreign language acquisition, as they may encounter gender issues in the target language that were not present in their native language. For example, an Iranian student with only a single pronoun representing

both genders in their native language may unknowingly reproduce gender biases by defaulting to "he" in generic pronouns when communicating in English.

METHODOLOGY

Design of the Study

The study used a multiple case study design (Yin, 2003) with textbooks to explore the connection between gender and language education's local and global material development. Content analysis (Mayring, 2000, 2014) was applied to identify subcategories and themes related to gender. The data were coded and categorized based on existing literature while keeping an open mind to discover new codes and themes during analysis. The corpus was examined for additional themes, and Holsti's (1969) reliability coefficient was used to calculate the number of agreements per total coding decision. The coefficient was 0.72, indicating satisfactory consistency between the researcher and the assistant. The study's second phase explored the role of religion and gender using Cheng and Beigi's (2012) model to analyze data from global versus local textbooks.

Data and Data Analysis

The study analyzed two sets of textbooks, the Solutions series (global) and the ILI series (local), to compare their effectiveness. Pre-intermediate textbooks were chosen as students commonly use them. The ILI series, created by Iranians, is widely used in Iran, with over 300 branches. The Solutions series by McMillan Press is a popular global textbook used in many language institutes nationwide. Three textbooks from each series were analyzed using descriptive statistics and presented in tables. A chi-square test was conducted using SPSS-18 software to determine the differences between the two sets.

Procedure

The content of the selected books from the ILI and Solutions series was analyzed in accordance with themes emerging in the related literature to examine gender representation. The target textbook series was scrutinized to ascertain how gender was represented in terms of (1) 'visibility in pictures (Hall, 2014); (2) 'visibility in the text' (Hall, 2014); (3) 'firstness (Bahman & Rahimi, 2010); (4) 'character activity' (Stockdale, 2006); (5) 'occupations' (Atay & Danju, 2012); and (6) 'topic dominance' (Stockdale, 2006).

Below is a brief description of the themes used for examining textual and visual content to ascertain gender representation:

i. Visibility in pictures has to do with the appearance of men and women in textbooks and the relative numbers of such representations. It is ascertained by counting the number of times males and females appear in texts.

ii. Visibility in the text is related to the frequency of proper nouns (e.g., Hassan, Bill), nouns (e.g., boy, daughter), and generic antecedents (e.g., him, she, herself, her) in

all passages. It is ascertained by counting the number of times proper nouns, nouns, and generic antecedents used in all passages.

iii. Firstness refers to the order of appearance of two gender-related nouns or pronouns. That is, when two gender-related nouns or pronouns are used as a pair in a text, such as boys and girls or he/she, the noun/pronoun appearing first can be interpreted as enjoying a higher status.

iv. Character activity refers to the types of activity performed by men and/or women in the textbooks. The distribution of activities associated with each gender (e.g., reading, playing music, truck driving, judging, playing tennis) was counted to ascertain character activity.

v. Occupation refers to a job, career, profession, and any other work carried out by a woman or man. The focus is on the occupational roles given to men and women in the textbooks. The type of occupations and their frequency were calculated for both genders to determine the occupations assigned to males and females.

vi. Topic dominance refers to the control of talk by either males or females. The reading passages and dialogues were closely scrutinized to find out the sex of the main character that exercises control over the dialogues or texts, as well as the frequency of speech turns.

In analyzing local textbooks, religion's relationship with gender issues was examined using Cheng and Beigi's (2012) model. The analysis encompassed religious content, including lexical items, narrative texts, and dialogues to establish references to Islamic concepts. These themes were investigated to determine the impact of religion on the textual and visual content of the textbooks: (i) women's clothing, (ii) attire of men and women, (iii) women's use of makeup, (iv) physical closeness, (v) interaction between men and women (talking or walking together), (vi) portrayal of men and women in traditional family roles, (vii) men and women driving, (viii) men and women sitting together alone, and (ix) representation of relationships.

RESULTS

Gender Representation in Globalized and Local Textbooks

The Solutions and ILI series textbooks were analyzed in terms of visibility in pictures, visibility in text, firstness, character activity, occupation, and topic dominance.

Gender Representation in a Local ELT Textbook Series. Table 1 summarizes the total frequency of gender representation in the ILI Pre-Intermediate series in terms of visibility in pictures, visibility in text, firstness, character activity, occupation, and topic dominance.

Table 1
An overview of gender representation frequencies in ILI pre-intermediate

Gender representation	Male	Female
Visibility in pictures	164	75
Visibility in text	321	243
Firstness	8	0
Character activity	15	18
Occupation	10	4
Topic dominance	5	3
Total	523	343

Gender representation in ILI pre-intermediate in terms of visibility in pictures, text, firstness, character activity, occupation, and topic dominance are displayed in Tables 2 to 7.

Table 2
Gender representation in ILI pre-intermediate in terms of visibility in pictures

Gender	Frequency
Male	164 (68%)
Female	75 (31%)

Table 2 reports the frequency and percentages of pictures connected to each gender at the ILI pre-intermediate level. Males statistically outnumbered females (68% vs. 31%), signifying that the authors were more concerned with including pictures of men rather than women.

Table 3 presents the frequency and percentages of the representation of masculinity and femininity in ILI pre-intermediate. The analysis indicates that

except for nouns, male proper nouns and generic terms outnumbered those of females.

Table 3
Gender representation in ILI pre-intermediate in terms of visibility in text

Gender	Proper nouns	Nouns	Generic	Total
Male	118 (60%)	6 (42%)	197 (55%)	321
Female	77 (39%)	8 (57%)	158 (44%)	243

The only instance in which men scored significantly higher than women was with respect to firstness (Table 4).

Table 4
Gender representation in ILI pre-intermediate in terms of firstness

Gender	Frequency
Male	8 (100%)
Female	0

As displayed in Table 5, out of 27 identified activities, females only took part in ten, such as taking English classes, playing the piano, and learning French, among which activities, namely visiting a fortune-teller and speaking emotionally about their own experiences, can be more expected from women in particular in Iranian traditional settings. By contrast, males performed seventeen indoor and outdoor activities, including playing sports (e.g., basketball and tennis), undertaking activities around the house (e.g., cutting the grass and putting the garbage out), and doing banking, which Iranian men mostly do.

Table 5
Gender representation in ILI pre-intermediate in terms of character activity

Gender	Male	Female
Character Activity	1. Speaking to students 2. Entertaining 3. Having pain 4. Having a speech 5. Playing the piano 6. Playing tennis 7. Playing basketball 8. Playing soccer 9. Taking a nap 10. Cutting the grass 11. Cashing the check 12. Renting an apartment 13. Studying English 14. Putting the garbage out 15. Learning Chinese 16. Doing homework 17. Giving up smoking	1. Suffering from depression 2. Being busy 3. Speaking emotionally about her experiences 4. Being talkative 5. Getting married 6. Visiting a fortune-teller 7. Taking English lessons 8. Practicing the piano 9. Learning French 10. Burning the food
Total	17	10

In Table 6, males were presented in a wider range and, overall, a higher level of employment than females (10:5) in ILI Pre-Intermediate. The analysis indicates that women occupied positions such as eye specialists, fortune tellers, and computer experts, with the exception of the portrayal of a woman as a taxi driver, which is a role often associated with men. In contrast, men enjoyed a greater diversity of occupations ranging from lower-ranking roles such as truck drivers, newspaper boys, and repairmen to higher-ranking roles such as surgeons, civil engineers, English/French teachers, and doctors. However, working as a receptionist is associated with both genders.

Table 6
Gender representation in ILI pre-intermediate in terms of occupation

Gender	Male	Female
Occupation	1. English teacher 2. Mechanic 3. Receptionist 4. Newspaper boy 5. Repairman 6. French teacher 7. Civil engineer 8. Camera club coordinator 9. Truck driver 10. Doctor	1. Receptionist 2. Eye specialist (doctor) 3. Fortune teller 4. Computer expert 5. Taxi driver
Total	10	4

Table 7 shows that men dominate the topics of conversation and reading passages. In five cases, men initiated the interaction with their partners. The number of words produced by men was 305 vs. 198 for females, and the number of their talks was almost twice more than their counterparts.

Table 7
Gender representation in ILI pre-intermediate in terms of topic dominance

Initiator of conversation	A female (receptionist)
	A male (Mr. Hopkins)
	A male (Mr. Harris)
	A female (Carol)
	A female (Ellen)
	A male (repairman)
	A male (Mike)
	A male (Mark)
	Male = 5 / Female = 3
Number of words	By male = 305
	By female = 198
Number of talks	By male = 42
	By female = 26

Gender Representation in a Globalized ELT Textbook Series. Table 8 displays the analysis results for the Solutions series as globalized English textbooks used in Iran.

Table 8
Gender representation frequencies based on textual and pictorial elements in Solutions pre-intermediate

Gender in textual and pictorial components of solutions pre-intermediate	Male representation	Female representation
Visibility in pictures	159	85
Visibility in text	364	309
Firstness	16	0
Character activity	19	14
Occupation	9	5
Topic dominance	8	7
Total	575	420

Note. The table shows how women and men were represented through textual and pictorial analysis of solutions pre-intermediate.

Table 9 clearly shows that males versus females (159 to 85) have not been equally presented throughout Solutions (pre-intermediate), and the difference between the frequencies of the pictures was statistically significant. Such an imperfect balance between the distributions of males/females in the illustrations can implicitly represent that women's achievements seem unequally important to the textbook's authors.

In Table 10, masculinity was presented in a wider range and, overall, a higher level of application than females in *Solutions Pre-intermediate*. A close examination indicates that visibility in text for men was nearly 10 percent more than for females.

Table 11 displays that female names were followed after male names in all the coordinated expressions, showing a statistically significant difference between genders.

Only 16 instances of man-woman dyad were identified in the book, among which men appeared first. As a case in point, "father and mother" and "brothers and sisters" were the samples used in the textbook in which males came first.

Table 9
Gender representation in solutions pre-intermediate in terms of visibility in pictures

Gender	Frequency	Asymptotic significance
Male	159 (66%)	0.00
Female	85 (34%)	0.00

Table 10
Gender representation in solutions pre-intermediate in terms of visibility in text

Gender	Proper nouns	Nouns	Generic	Total
Male	208 (53%)	48 (55%)	108 (58%)	364
Female	191 (47%)	40 (45%)	78 (42%)	309

Table 11
Gender representation in solutions pre-intermediate in terms of firstness

Gender	Frequency	Asymptotic significance
Male	16 (100%)	-
Female	0	0.00

The list of activities in Table 12 presents different activities performed by female and male characters in the textbook.

Table 12
Gender representation in solutions pre-intermediate in terms of character activity

Gender	Male	Female
Character activity	1. Playing tennis	1. Skatebooarding
	2. Making dinner	2. Ice skating
	3. Having exams	3. Playing guitar
	4. Doing some exercise	4. Burning hands
	5. Climbing	5. Visiting a friend
	6. Swimming	6. Doing extreme sports

Table 12 *(continue)*

Gender	Male	Female
Character activity	7. Doing BBQ	7. Base jumping
	8. Backpacking	8. Swimming
	9. Getting lost	9. Code-breaking
	10. Left the college	10. Playing piano
	11. Writing letters	11. Watching a film
	12. Gradening	12. Watching TV
	13. Taking computer course	13. Eating sweets
	14. Working long hours	14. Eating
	15. Slicing the potatoes	
	16. Being on an island alone	
	17. Working hard	
	18. Reading	
	19. Playing volleyball	
Total	19	14

A close look at Table 12 shows the almost equal distribution of activities between genders. In addition, female activities are not restricted to passive indoor activities such as watching television or reading a newspaper, as they also enjoy active outdoor roles such as doing extreme sports, base jumping, and playing instruments such as the piano and guitar. On the other side, men were not restricted to a set of pre-defined traditional characters as activities such as slicing potatoes (which seems to be more feminine) plus some other activities, namely playing tennis and volleyball, were used for men.

The occupations of males and females portrayed in the textbooks are presented in Table 13 as follows:

Table 13
Gender representation in solutions pre-intermediate in terms of occupation

Gender	Male	Female
Occupation	1. Math teacher	1. Sportswoman
	2. Sailor	2. Musician
	3. Workmen	3. Sports coach
	4. Actor	4. Accountant
	5. Gardener	5. Inventor
	6. Charity fund-raiser	
	7. Teacher	
	8. Doctor	
	9. Army	
Total	9	5

The male occupations outnumbered females by a ratio of 9:5, which indicates that males were still present in traditional works, such as army men and sailors. In contrast, females were represented as an indoor occupation, such as an accountant, which does not need a great amount of contact with other men. Further, there were two occupations in the domain of sport, such as sportswoman and sports coach, which were mainly applied to females, which can represent the advancement of Iranian women in sports activities. Additionally, from the researcher's point of view, it could be seen that the occupation of "inventor" was a nontraditional role for females.

Table 14 presents the results of male-female topic dominance in dialogues and reading passages of *Solutions (Pre-Intermediate).*

The analysis illustrated that males in eight cases and females in seven were the initiators of conversations, so significant dominance has been identified in the benefits of either gender. However, in the second comparison category, females uttered almost 200 words more than men in text.

Comparison of Gender Representation in Local and Global Textbooks

The current study also sought to examine whether the Solutions series and ILI series textbooks are significantly different in terms of gender representation. A Chi-square test was run to address the difference.

Table 15 demonstrates the results of the Chi-square between the Solutions and ILI textbook series.

Table 14
Gender representation in Solutions pre-intermediate in terms of topic dominance

Initiator of conversation	A female (Martha)
	A male (Sam)
	A male (Sam)
	A male (Jack)
	A male (Ted)
	A male (Toby)
	A female (Mia)
	A female (Ryan)
	A male (Toby)
	A female (Beth)
	A female
	A female (Ryan)
	A male (Matt)
	A female
	A male (Max)
	Male = 8 / Female = 7
Number of words	By male = 795
	By female = 969
Number of talks	By male = 101
	By female = 99

Table 15
Chi-square between the Solutions and ILI textbook series in terms of visibility in pictures

Chi-square	Asymptotic significance (2-sided)
Pearson Chi-square	0.003
Likelihood ratio	0.028
Linear-by-linear association	0.014

According to the chi-square results, there was no significant difference between the Solutions and ILI textbook series in terms of overall gender representation ($x2$: 1.29 p > 0.05). However, the globalized and local textbooks still depicted women less frequently in terms of visual, textual, and firstness parameters. In addition, the Solutions series had a higher number of female characters compared to the ILI series in terms of visual and textual representation, as well as character activities and topic dominance. Furthermore, the quality of activities and representation of women in pictures, as well as their activation in the text, was notably better in the case of the Solutions as a globalized textbook. For instance, women appeared more confident in the photos of this series and were portrayed engaging in various activities.

Intersectionality of Gender and Religion

The intersectionality of gender and religion was analyzed through Kow and Beigi's (2012) model, given that in local Iranian textbooks, the element of religion plays an important role.

Visual.

Women's Apparel.

The detailed analysis of the Solutions Series shows that in most cases, the women were portrayed without headscarves or any other head covering, except for one case in which a headscarf was a fashion statement. In another case, the weather was cold, and a female wore a hat. It is worth mentioning that the outfits throughout the whole series were quite appropriate, with no revealing clothes, probably because the authors presumably intended to publish a textbook applicable in all contexts, even in religious settings. In addition, women in all cases were shown with natural and light makeup. However, women portrayed in the ILI books dressed modestly, adhering to the dress codes in Islam. Clothes appropriate for tasks in different situations allowed learners to participate more in class and teachers a chance to engage the learners in discussing the tasks. In general, men and women in ILI books were in modest Islamic style and not in flashy clothes, including long shirts, loose garments, and long dresses.

Revealing Attire.

Most pictures in the Solutions series adhere to moral standards. Women are depicted modestly, wearing sweaters or shirts, with occasional short sleeves or t-shirts. Men are consistently dressed casually and appropriately. Minimal bare skin is shown, typically below the elbows and knees. In the ILI books, women's heads were uncovered, but they wore long dresses or coats. Men in the Solutions series are also appropriately attired.

Female Appearance.

The women in Solutions were wearing makeup, especially lipstick and jewelry, possibly to attract the learners' attention and promote Western culture. Their hair colors were mainly blond and black. In

the ILI Series, by contrast, the images were based on Islamic culture and natural light makeup was used in accordance with religious procedures. Muslim women are prohibited from using makeup to attract the opposite sex.

Physical Proximity.

In non-Muslim countries, interactions between people are more comfortable, and restrictions on relationships between men and women are fewer. The ILI series depicts that close blood relatives (mahram) can have close contact. The focus is on family relationships, following social norms, and Islamic regulations. While pictures show interaction between male and female classmates, they maintain distance and adhere to the rule against physical contact.

Men and Women in New Roles.

The Solutions series challenges traditional gender roles by depicting a more modern and equitable society. Women are shown engaging in roles traditionally associated with men, such as footballers and pilots. However, women are also portrayed as the central figures in managing the household and family responsibilities. In contrast, the ILI series often portrays middle-aged women as housewives, while men relax at home. Nevertheless, it includes images of women working as cashiers or travel agents, indicating increased female employment and responsibility in Islamic societies. In general, men are depicted as providers and protectors of the family.

Dyadic Interaction.

The Solutions series primarily depicts men and women forming dyads, discussing various topics such as weather, weekend plans, and class exams. These dyads involve friendships or classmates. In same-gender dyads, the relationships are typically partner-partner, classmate-classmate, doctor-patient, or teacher-learner, maintaining appropriate social distance. Dyads are also formed at the gym and during social gatherings, with men and women socializing and enjoying music.

Equity.

Some men and women illustrated in the Solutions series have white skin, while others have black skin. It reflects the situation in Western societies in which people of different races, colors, and cultures live together, and instructional textbooks can be seen as a device to train language learners and teach them how to live with others. It can also teach them that people have the same rights despite differences of color and religion. However, in the ILI series, only people with the same eye and hair color and ethnic backgrounds are shown. Despite the ethnic variety of Iran, which includes Turks, Kurds, and Lurs, different ethnicity is not represented in the pictures.

Textual Material

The study also analyzed words and dialogues in both textbook series and found that throughout the Solutions series, there are no words, expressions, or concepts that could be regarded as insulting Islam, inciting anti-

Islamic feelings, or disregarding Islamic restrictions. For example, although it has often been observed that in some other foreign-authored textbooks, dyadic groups of men and women or boys and girls are represented, no such scenes were found in the Solutions series.

While there are no anti-Islamic elements in this book series, Islamic practices are not featured either. It suggests that the series' authors aimed to create a textbook suitable for various religious orientations. Interestingly, the names of different characters in the ILL series are mostly foreign despite being published in Iran. However, a few common Islamic names are used. The topics discussed align with Iranian culture and Islamic beliefs, focusing on driving, campus events, education, and sports. Extramarital relationships are not mentioned in the book, carefully avoiding the activation of relational dynamics (van Leeuwen, 2008).

DISCUSSION

The findings indicate that the Solutions textbooks offer a more nuanced and balanced picture of women than the ILI textbooks. Such gender imbalance or bias in the ILI textbooks is likely to reproduce gender bias in society through education, which, according to Blumberg (2008), can affect the educational progress of female students. In addition, the findings from the analysis of the ILI textbooks contradict the overall picture of gender equality in education, as reported in Western studies. The results concur with the studies undertaken by Ansary and

Babaii (2003), Bahman and Rahimi (2010), Ghajarieh and Salami (2016), and Lee and Mahmoudi-Gahrouei (2020). The present research confirms the outcome of a related study by Ulum and Köksal's (2019), which shows the predominance of the expanding circle culture in locally authored EFL textbooks and the prevalence of the inner circle culture in globally written textbooks.

While a more gender-balanced picture was expected in advance in global textbooks, given that local textbooks are generally written with an emphasis on religious, social, and cultural aspects of the students' L1, the data obtained from a sample of Iranian local textbooks indicates a rather bigger gap in gender equality. It could be consequential for girls using local textbooks in Iran, particularly the younger ones from religious families who make up the majority of those who use the ILI series. The representation of religion in the ILI series, addressed in the second research question, also highlights a level of religiosity represented in them. In turn, it doubles the discrimination against girls using English textbooks produced locally. The global textbooks, however, tend to avoid religious topics as an integral component of globalization and inclusion.

The case of local and global textbooks in Iran is rather complicated, and the data obtained needs to be discussed with reference to the sociopolitical and religious milieu of Iranian society. English is taught in state and private schools. Many parents and adult English learners prefer shadow education in English institutes because better teachers and textbooks are employed. However, the findings of this study also

indicate that close attention should be paid to the content of the textbooks adopted for use in the shadow education sector. Although these textbooks provide ample exposure to English as a Foreign Language, the content may reproduce the kind of gender and religious bias that is prevalent in society. The ILI series, in particular, tends to disadvantage teenage girls. The picture looks far gloomier in the case of girls with financial difficulties, particularly those living in rural areas since they cannot even enroll at English institutes to enable them to improve their proficiency in English and broaden their vision of gender equality.

The results of the current study can hopefully shed more light on the intersection of gender, globalization, and religion and motivate international investigations on gender at the intersections of other social factors. A possible solution to address the issue of global versus local textbooks is to produce a glocalized edition of the global textbooks, as suggested by Sulaimani and Elyas (2018). The authors of this article have recently published a textbook in Iran with the help of a native English speaker in which many aspects of English as a global and local language were included in the textbook and taught to Iranian students.

CONCLUSION AND IMPLICATIONS

This study has shown how an imbalance in gender representation can affect local and global textbooks in terms of presenting a gender-neutral picture of men and women. The findings can be made available to create EFL stakeholders' awareness in terms of gender imbalance and could perhaps contribute to the development of textbooks from a glocalized perspective to create a better balance in the representation of both genders. The findings could also contribute to establishing a framework to assist textbook writers in designing educational materials that help enhance a gender-fairer society in Iran.

In the Iranian context, the focus on religion is an important social factor in the development of textbooks, as it contributes to the construction of gender. Despite some negative aspects of globalization, a more balanced representation of women in global textbooks has the potential to open a new route to gender equality. To keep up with global changes, and in view of the changing world of education, textbook writers should not go to the extreme of eliminating important and harmless cultural beliefs and notions about gender and religion.

Recommendation for Future Research

This study has undertaken research at the intersection of gender, religion, and globalization. A possible way forward is to evaluate local textbooks from other countries and compare their content with international textbooks in terms of gender. Teachers' guides can accompany existing textbooks to stimulate discussions on inequality on the grounds of gender, race, etc. Teachers, as the main stakeholders of textbooks, can play a significant role in raising their students' awareness. Textbook writers should be interviewed to give more detailed insights

into their conceptualizations of gender bias and gender equality when writing textbooks. Including students' voices and their points of view would be another avenue for future research in a different educational milieu. In Iran, religion plays a significant role in society, and educators and curriculum developers must present a fair and nuanced representation of women based on religious ideations, avoiding any partiality in textbooks. Future research should emphasize the significance of religion in educational materials authored by Iranians, as well as in those utilized in other Muslim countries such as Malaysia and Indonesia.

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Implementation of Early Reading Games to Teach English Using Integrated Sound Word Method for Preschoolers

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ABSTRACT

In teaching English reading skills to preschoolers, two primary reading instruction approaches have been established: the Phonics Approach and the Whole Language Approach. However, no evidence was found in the past studies to support these methods in the Malaysian setting. This study examines the effects of early reading games on teaching English among second language learners in preschools using the Integrated Sound Word Method using 60 preschoolers aged six years old in the district of Kuala Lumpur as samples. Two groups were formed to be assigned as the control group and intervention group. Pre-test, post-test, and post-test 2 were administered to the control and intervention groups before and after the quasi-experimental study. The Integrated Sound Word Method incorporated early reading games as an intervention for the intervention group. This study used one-way analysis of variance (ANOVA) as well as the learning outcomes of the experimental study to measure its significance. The findings showed that the intervention group performed better in improving early reading proficiency through games as compared to the control group at each level. The participants in the intervention group are able to grasp early reading proficiency after learning through early reading games using the Integrated Sound Word Method. This study has several implications for educators and policymakers in developing effective reading programs for second language learners, emphasizing the significance of a balanced approach to achieving the objectives of the Malaysia Education Blueprint (2013–2025).

Keywords: Early reading games, English teaching, integrated sound word method, preschool children, quasi-experimental design

INTRODUCTION

The first step in teaching children to read is to engage their attention (Hendrickson, 2014). All teachers desire to make learning the English language easy and interesting for students. Two primary reading instruction approaches have been established throughout the years: the Phonics Approach and the Whole Language Approach. *Jolly Phonics* (n.d.), developed by Chris Jolly in 1989, is one of the most widely utilized phonics methods in preschools worldwide. Meanwhile, Glen Doman's reading flash cards are well-known for their whole language reading strategy. Both theories differ in certain areas, but they benefit children's early reading development. These approaches may appear effective in foreign nations where English is the national language. However, there has been no evidence to support these approaches in the Malaysian setting, where most children are English as a Second Language learners (Mohidin et al., 2015). The approach to learning and teaching early reading for second language learners may differ slightly from English-native language learners. Malaysia is still considered a novice in teaching emergent reading to English as a Second Language (L2) learners in preschools. There is currently no concrete structure or system in place to effectively teach early reading for the English language (Azman, 2016). Specifically, exploring reading methods to teach children to read in the Malaysian context has not yielded appropriate results.

Hence, this study employed the Integrated Sound Word Method as an intervention tool for educational games to increase early English language reading proficiency among second language learners in preschools. The purpose of this study is to examine the effects of early reading games on teaching English among Second Language Learners in preschools using the Integrated Sound Word Method. The purpose of this study also aligns with the Malaysia Education Blueprint's second transformation shift (2013–2025). The Integrated Sound Word Method is a balanced method of teaching early reading skills in preschools that are systematically and sequentially structured. It builds meaningful English words, phrases, and brief sentences using targeted alphabetical letters and sounds, using visual flashcards and translation from the mother tongue (L1; Haron et al., 2008). Local contexts are incorporated into preschool lessons to assist children in connecting the words they learn in the classroom to their real-life events. Furthermore, preschool teachers are encouraged to make learning enjoyable and meaningful by including early reading games to stimulate children's interest in learning English. In order for children to master a language, a friendly, interactive learning environment should be established for them to learn the language and apply the knowledge in their surroundings rather than learning through memorization (Yamat et al., 2014).

This research study intends to contribute new insights to improve the English

language early reading proficiency among second language learners in preschools to enrich the previous research studies. A quasi-experimental study was chosen to examine the effect of early reading games on teaching English using Integrated Sound Word Methods in preschools. The results from this research study hope to bring awareness to the importance of using a balanced approach to achieve the objectives of the Ministry of Education (MOE) as stated in the Malaysia Education Blueprint (2013–2025), where all students are "expected to acquire knowledge, high order thinking skills, leadership skills, bilingual proficiency, ethics, spirituality, and national identity" (Ministry of Education Malaysia, 2013, p. 30).

Literature Review

The teaching and learning philosophies in preschools differ from one another to meet the needs of their targeted preschoolers in supporting English language acquisition. Due to social and environmental changes, English language teaching and learning strategies have evolved over the last few decades to meet the needs of current students (Thirusanku & Yunus, 2014). The focus of the current preschool curriculum is to create a balanced and holistic learning atmosphere that covers intellectual, physical, artistic, emotional, social, spiritual, and character development (Chee et al., 2017). It is crucial to choose and use a precise pedagogy to accommodate the needs of today's young children in Malaysia. However, there is currently no systematic method to effectively guide early reading in the English language within Malaysian contexts. The reasons include insufficient teaching and learning materials, which impacted the quality of English language learning in the classroom. Preschool teachers need to be better equipped in terms of English language proficiency. As a result, adequate training is required to teach English as a Second Language in schools, as most English teachers' language proficiency falls short of the academic standard (Azman, 2016). Preschoolers begin to learn various new skills, including reading in English, during their early preschool years. As English is not their mother tongue language, many of them have difficulty understanding the language and struggle to perform well in school. Researchers argued that "strong influence in mother tongue language" has hindered Second Language learners from excelling in second language acquisition (Musa et al., 2012). This issue has allowed researchers to explore this area of study further.

In their research study, Hardman and A-Rahman (2014) proposed a new teaching and learning English method that emphasized communication and interactive learning to overcome low English proficiency among Malaysian students. Earlier, the researcher performed experimental research on the whole language approach in private preschool classes in Selangor to remediate English language reading fluency (Gnanasugirtham, 2005). Another research study explored the computer program CAI to teach and learn English compared

to the traditional method (Lim, 2000). Additionally, a case study conducted by Ali (2003) mentioned that "some English teachers lacked the English language proficiency and the pedagogical knowledge to teach the language, and some claimed they were not confident in their language proficiency" (p. 4). Thirusanku and Yunus (2014) urged that there should be well-rounded and high-quality English teachers who will be able to articulate and teach the language. Teachers should also be equipped with the ability to encourage current-generation students. Ideally, a childcare center and preschool's atmosphere should be inviting to instill learning, positively affecting children's emergent literacy (Whitehurst & Lonigan, 1998).

A research study suggested that 'a language curriculum that advances on inclusive, learning-by-doing experiences would encourage a more meaningful learning.' To attract students' interest in learning the English language, teachers must create a reflective learning pedagogy that allows students to be more independent and involved in their learning process (Musa et al., 2012). It is because the learning environment seems to impact the children's holistic development as they feel confident to use the language and are given the exposure and opportunities to use the language (Yamat et al., 2014). Moreover, the implementation of active learning within the classroom setting has been shown to enhance students' comprehension of the English language and facilitate improvements in their academic performance. This positive outcome can be attributed to creating a supportive and non-intimidating learning environment, which effectively stimulates and sustains students' motivation to engage with the language (Ibrahim et al., 2015). In conclusion, the utilization of early reading games as an instructional tool for preschoolers learning English as a second language has the potential to create a nurturing and motivating learning atmosphere conducive to language acquisition and development.

A century ago, there were heated debates in Western countries over the emerging reading and writing approaches. There are two known approaches: the Phonics Approach and the Whole Language Approach. The Phonics Approach is an alphabetical order system where each letter is represented by a unique sound called a phoneme. This approach teaches children to recognize letters and sounds in order from a–z, then blend a few individual sounds to build words. It is described as the "bottom-up" instruction to decode reading texts. It helps children to recognize the relationship between the letter and its sound. The combining and blending of the letters and sounds formed a word. However, each letter is independent and does not represent any meaning. On the other hand, the Whole Language approach emphasizes "top-bottom" instruction, where children are taught to read and recognize sets of words based on their prior knowledge and experiences encountered in the world around them (Gnanasugirtham, 2005). One of the avenues through which children acquire the ability to read meaningful words

is through their routine interactions with parents, siblings, and friends, as well as exposure to environments that facilitate the recall of learned words.

Although this method enables children to read familiar words rapidly, they are limited to recognizing and reading solely those words that they have previously identified and learned. Consequently, any words that are novel or unfamiliar to the children remain beyond their reading capacity (Yarmi, 2019). Another reading approach, the Integrated Sound Word Method, assimilates the Phonics and Whole Language approaches. It uses the strengths of both methods, integrating them systematically and allowing children to read and write meaningful words (Haron et al., 2008). The Integrated Sound Word Method is a balanced approach that targets the most used letters and sounds to build meaningful words. Children are taught a few vowel and consonant sounds to build simple words that they are familiar with in systematic and sequential ways. The children then expanded their vocabulary by incorporating more letters and sounds into their previous learning (Haron et al., 2008).

Hence, integrating these methodologies holds significant importance in facilitating the English language acquisition process within the Malaysian education system, particularly for emergent readers, such as preschool-aged children. In the Malaysian context of English language education, teachers must exhibit tolerance towards students' cultural and social backgrounds to enhance their proficiency in reading

English (Kustati et al., 2020). Living in a multicultural country like Malaysia, acquiring English requires a different approach compared to acquiring the students' native language (Ramlan & Maarof, 2014). Even though the English language and the Malay language share some common terms as they come from the same Latin roots and use an alphabetical system, the letters in both languages produce different phonemes. Furthermore, the use of grammar in sentence structures or syntax in the English language is different from the Malay language (Haron et al., 2008).

A 'Simple View' of reading was developed by Philip Gough (as cited in Wren, 2000), according to which a person's capacity for reading comprehension (R) is determined by their ability to decode (D) and comprehend (C). Therefore, for a person to master a reading skill, he or she must be able to decode text and comprehend the language (R = D x C). The value of D and C can range from 0 to 1 (Wren, 2000). Imagine a child who has no difficulty understanding a spoken language, which means he or she would have a perfect comprehension score of 1. Unfortunately, the child cannot decode any text at all, which gives him or her a decoding score of 0. When these numbers are put into R = D x C, R = 0 x 1 = 0, the child fails in reading comprehension because if the child is unable to decode text, he or she is possibly unable to read and comprehend text. On the other hand, if a child can decode text and comprehend spoken language, he or she would score 1 in decoding and comprehension. It leads

to R = 1 x 1 = 1, which concludes that the child has successfully achieved a reading comprehension skill (Wren, 2000).

The term comprehension refers to the ability to understand and draw inferences from speech in a language the person can understand (Wren, 2000). Living in a multicultural country like Malaysia, children's native language (mother tongue) comprehension may be high, but if they are in a classroom learning English as a second language, their English language comprehension ability may be limited. Children must know about the environment in which they live and have detailed background knowledge relevant to what they are trying to understand to have strong language comprehension skills. This knowledge is more important than memorizing facts or word definitions. Personal experiences, scripts, and schemas can help those children understand how the world around them works. Children learn by imitation and draw inferences from the new information based on the information they already know. The English language is derived from the individual sounds assembled to form words, a combination of words to form sentences, and arranged to convey ideas. It is known as linguistic knowledge. Linguistic knowledge builds upon the three elements of phonology, syntax, and semantics (Wren, 2000). Phonology comes into play when children are able to hear and distinguish the sounds that make up the spoken language. Usually, children who grow up in a normal linguistic environment can distinguish between

different speech sounds in their native language. However, lack of exposure to English phonology may cause difficulty in differentiating the English phonemes, which leads to confusion when these words appear in context, and their comprehension skills will be affected (Wren, 2000).

The English lessons conducted in preschool classrooms are highly structured and give little room for preschoolers to express themselves, and they do not represent the ideal reflection of effective practice for early childhood education. The assumption of fun, meaningful play-based activities in preschools was found to be taught seated from one subject to another in the classroom most of the time (Qin & Md Nor, 2018). Children learn through games because they are associated with play. In the olden days, many preschools preferred to separate learning and playtime because many parents in Malaysia expect their children to excel in academic achievement, such as mastery in Reading, Writing, and Arithmetic (3R) before they enter primary education. The emphasis on academic achievement in Malaysian preschools resulted in the poor implementation of active learning and play-based approaches (Qin & Md Nor, 2018). A significant shift has occurred in the learning field from a traditional, didactic model of instruction to more child-directed learning. Empirical evidence shows that games can effectively enhance learning and understanding of complex subject matter (Garris et al., 2002). According to Jean Piaget's perspective, play is considered as children working with

experiences that give them opportunities to be in control of their tasks (Samuelsson & Carlsson, 2008). Whitehall and McDonald (1993) and Ricci et al. (1996), as cited in Garris et al. (2002), found that incorporating game features in learning instruction led to improved learning, which resulted in greater persistence on the task and led to greater attention to the content and greater retention. Hence, game-based English learning as a pedagogical approach is potentially an efficacious means of enhancing the language acquisition process among preschool children.

Playing games with peers allows them to exercise self-control and develop skills they already know, such as taking turns, cooperating, and socializing. Research findings by Fung and Min (2016) revealed that board games are a useful tool to engage students in class and to enhance the speaking ability of low-proficiency ESL learners. Montessori's (1912) pedagogy claims that play activities activate the child's inner drive to learn using appropriate tools/toys. Whereas in the High Scope program, children are facilitated by teachers during activity sessions at the child's level of development using structured instruction where children have to be active. In Sweden, the preschool curriculum requires the environment in preschools to be joyful to ensure the children feel a sense of belonging as well as encourage communication, play, and learning (Samuelsson & Carlsson, 2008). However, in Malaysia, students feel that learning the English language is boring and dreadful as it mostly does not play a part in their life outside of school (Fung & Min, 2016; Rahman & Maarof, 2018). Teachers should increase teaching methodology through games as learning activities to stimulate students' interest in learning the English language and enhance proficiency. The influence of games has rapidly evolved into a trend for learning and interactive learning experiences. It allows more flexibility for students to control their learning while governed by the structural game rules (Fung & Min, 2016). Lee (2012) stressed that implementing board games aligned with the national curriculum and matched with specific learning objectives can be effective for learning. It creates a meaningful teaching tool as students learn and generate a substantial amount of new vocabulary from the games. Learners can practice all the language skills and types of communication through games (Ersoz, 2000).

According to the findings, game-based learning has the potential to enhance children's turn-taking abilities by providing equal opportunities for play and fostering cooperation skills within learning contexts (Loukatari et al., 2019). This skill creates a learning environment that incorporates the elements of cooperative learning, competition, excitement, curiosity, and creativity (Fung & Min, 2016). However, the effectiveness of early reading games in teaching English has not been proven in the Malaysian context. Therefore, there is a need for rigorous implementation to bridge the gap between rhetoric and reality

in preschoolers' English teaching and learning using the integrated Sound Word Method (Qin & Md Nor, 2018). To ensure the research questions proposed are well-supported, they require evidence: Does the Integrated Sound Word Method with early reading games enhance the English early reading proficiency of preschool children?

Following the literature review mentioned above, hypotheses 1 and 2 were proposed.

> H1: Implementing the Integrated Sound Word Method through early reading games significantly enhances the early learning of English among participants in the intervention group.

> H2: In each level of the post-test, the intervention group shows greater improvement in the early learning of English through reading games using the Integrated Sound Word Method compared to the control group.

Therefore, the effect of encouraging preschoolers' interest in learning the English language through early reading games using the Integrated Sound Word Method is the focus of this study.

METHODOLOGY

The research design used quasi-experimental research, where the study is framed as a quantitative study. This type of research directly attempts to influence a particular variable, and it is suitable for cause-and-effect relationships (Fraenkel & Wallen, 2009).

Recruitment and Consent

The study was conducted in public preschool classrooms in Kuala Lumpur. It strives to instill early English reading effectively and meaningfully. In general, regardless of the level or type of school, the Malaysian education system promotes bilingualism and multilingualism in teaching and learning instructions. In vernacular schools, mother tongue and English are used as mediums of instruction and communication (How et al., 2015). Preschoolers who enroll in any preschool in Malaysia are required to learn English as a Second Language. In recent years, preschoolers' enrollment in government schools has increased from 194,225 in 2014 to 198,574 in 2015 and 200,522 in 2016 (Educational Planning and Research Division, 2016). By 2017, there were 201,249 enrollments in government-funded preschools, while 329,251 preschoolers were from private kindergartens, and 297,455 preschoolers were from other educational agencies (Educational Planning and Research Division, 2017). Many preschoolers get their first exposure to the English language through formal education in preschools (Azman, 2016).

In this study, a total of sixty participants from two government preschools located in Kuala Lumpur were selected through purposive sampling and were then assigned as the control and intervention groups. All the participants were selected through a matching process, where the participants are at the age of 6 with low English proficiency. The purpose of the matching process is

to control the threat to internal validity. The researchers also matched the gender of participants in this study to get an almost equal number of female and male participants in the control and intervention groups. The control group consists of thirty participants, including sixteen females and fourteen males, while the intervention group consists of thirty participants, with fourteen females and sixteen male participants. The population's demographics are classified as low socioeconomic group, with most residents living in government-supported housing apartments and having little understanding of the English language. Most of the students in these schools are Malays learning English as a second language.

Ethical approval for this research was obtained from the Research Ethics Committee of the authors' University. Upon obtaining ethical clearance, we sought the assistance of preschool directors and class teachers to facilitate obtaining informed consent from the parents of sampled children included in our study. The consent forms were duly signed by all parents, thereby ensuring their voluntary participation and agreement to adhere to the study procedures. Our commitment to ethical standards and procedures was further strengthened by conducting the study in accordance with the relevant guidelines and protocols.

Procedure

In this quasi-experimental study, since all participants have been matched prior to the commencement of the experimental study, the participants' age, English language proficiency, and gender will not be considered as factors that affect the study results. According to Fraenkel and Wallen (2009), researchers who conduct experimental studies try their best to control any subject characteristics that might affect the study's outcome. Matching allows the participants to be matched on a certain variable of interest.

To achieve the objectives of this research study, both the control and intervention groups received pre-test, post-test, and post-test 2 before and after the quasi-experimental study. The Integrated Sound Word Method was incorporated through early reading games as an intervention mode for the intervention group. Purposive sampling was used to select the preschools because these schools have been identified as being at risk for English language deficiency.

Teaching Training and Materials

The researchers then instruct the preschool teacher to carry out the teaching instructions in the classroom using all the teaching materials provided. There are large groups and small group activities in each lesson, with early reading games as an essential part of the instruction.

Firstly, the teachers were introduced to the early reading games using the Integrated Sound Word Method and its benefits for preschoolers. Then, teachers are provided with a detailed explanation of the early reading games, including alphabet card games, alphabet dice games, "I Spy," "Letter Sounds Listening Game," "Blending Bus," "Words Builder," and "The Magic Pot."

Next, they need to understand how these games are designed to achieve the learning objectives and encourage social interaction among preschoolers. Specifically, teachers should have a clear understanding of the learning objectives for each lesson and how to track each child's progress. At the same time, the teachers should be trained on how to conduct large and small group activities effectively. The researchers provide specific instructions to teachers on carrying out the teaching instructions in the classroom using all the provided materials to ensure the teachers understand how to integrate early reading games and other activities into the lesson plan.

During the intervention period, the participants received weekly English language instruction. Specifically, a list of 15 words was taught each week, resulting in 60 words learned throughout the intervention. Within each week, the same list of 15 words was taught in each session. Classes were conducted for 30 minutes per day, three times weekly, over 4 weeks, providing 6 hours of English language instruction. The intervention group was instructed using the Integrated Sound Word Method, which incorporated early reading games, whereas the control group received early reading instruction without such games. It is crucial to employ conventional curricula as control conditions. The teachers in the control group continued using traditional early reading activities, which are typical for preschoolers.

Outcome Assessments

Preschoolers' early reading proficiency can be measured using various assessments, such as testing letter knowledge, phonological awareness, and decoding skills. A preschooler who demonstrates early reading proficiency may be able to identify letters, match words to sounds, and recognize some basic sight words (Lonigan et al., 2000). All participants were assessed for early reading proficiency through pre-test, post-test, and post-test 2, which included measures of word-sound recognition and reading comprehension within the 60 taught words. The pre-test, post-test, and post-test 2 each lasted one week. The pre-test and post-test were spaced apart by 4 weeks, while a 2-week interval separated the post-test and post-test 2. Identical assessments were administered to both groups.

Analysis

Data collected from pre-test, post-test, and post-test 2 were analyzed using IBM Statistical Packages for Social Science (SPSS). Both descriptive and inferential statistical analysis were used to summarize the overall trends or tendencies of the data to get an in-depth understanding of how the scores might vary and to provide insight into how one score stands compared to two variables (Creswell, 2008). Therefore, one-way analysis of variance (ANOVA) is used to determine the overall changes over time and whether participants in the intervention group elicit a significant effect in learning English through early reading games using the integrated Sound Word Method.

ANOVA measured if there is a significant difference between the pre-test, post-test, and post-test 2 scores of the control and intervention groups. Then, repeated measure analysis examines differences in mean scores between pre-test, post-test, and post-test 2. The significance level is specified at 0.05 (alpha, $\alpha = 0.05$).

RESULTS

Data collected from the quasi-experimental study were sorted for analysis. The analysis was divided into two sections: (1) a descriptive analysis of the profiles of participants and (2) a descriptive and inferential analysis of the effect of early reading games in teaching English using the Integrated Sound Word Method in preschool.

The mean scores of Level 1 pre-tests for control and intervention groups are 47.33 and 55.00, while the standard deviations are 29.24 and 23.89, respectively. The mean scores of Level 2 pre-tests for control and intervention groups are 22.33 and 22.00, while the standard deviations are 32.63 and 25.82, respectively. For Level 3 pre-tests, the mean scores and standard deviation of the control group are 8.67 and 23.89. The intervention group's mean score is 8.00, and the standard deviation is 14.72 for the same Level 3 pre-test. Whereas the Level 4 pre-tests' mean score and standard deviation for the control group are 5.00 and 20.13, respectively, and for the intervention group are 3.67 and 9.64, respectively.

Table 1

Differences in early reading diagnostic pre-test of control group – intervention group

Early Reading Diagnostic		Sum of Squares	df	Mean Square	F	Sig.
Level 1 Pre-test	Between Groups	881.67	1	881.67	1.24	0.271
	Within Groups	41336.67	58	712.70		
Level 2 Pre-test	Between Groups	1.67	1	1.67	0.002	0.965
	Within Groups	50216.67	58	865.81		
Level 3 Pre-test	Between Groups	6.67	1	6.67	0.017	0.897
	Within Groups	22826.67	58	393.56		
Level 4 Pre-test	Between Groups	26.67	1	26.67	0.107	0.745
	Within Groups	14446.67	58	249.08		

Table 1, shown above, is a One-way ANOVA result that shows overall changes in pre-test mean scores by groups. It means that there is no difference in the overall Level 1 pre-test between the control group and the intervention group. Similar patterns are shown in the Level 2 pre-test's score F $(1, 58) = 0.002$, $p > 0.05$, the Level 3 pre-test's score F $(1, 58) = 0.017$, $p > 0.05$, and Level 4 pre-test's score F $(1, 58) = 0.107$,

$p > 0.05$. As a result, the Levels 1, 2, 3, and 4 pre-test results are not significant since all its p-value is greater than 0.05. There are no significant differences in the overall mean scores before the treatment program started in this research study. The Test of Homogeneity of Variances supports these scores through Levene's test. The pre-test scores of Levels 1 to 4 for both control group and intervention group are not significant as (F = 2.18, p = 0.146), (F = 2.11, p = 0.152), (F = 0.94, p = 0.335), and (F = 1.10, p = 0.298) at its respected level, where the α values ($p > 0.05$). It means that participants in control and intervention groups are at equally similar levels in early reading English proficiency before the commencement of the experimental study.

The mean scores of Level 1 pre-test, post-test, and post-test 2 for the control group are 47.33, 64.00, and 57.67, respectively, while its standard deviations are 29.24, 28.11, and 31.48. The mean scores of Level 2 pre-test, post-test, and post-test 2 are 22.00, 41.00, and 37.33, while its standard deviations are 32.63, 43.58, and 41.02, respectively. For Level 3 pre-test, post-test, and post-test 2, mean scores and standard deviation are (M = 8.67, 25.33, 23.00) and (SD = 23.89, 43.30, 39.49), respectively. Level 4 pre-test mean score is 5.00, post-test mean score is 15.00, and post-test 2 mean score is 13.67. Its standard deviation showed 20.13, 35.11, and 32.32 for pre-test, post-test, and post-test 2.

Table 2
Differences in early reading diagnostic of a control group

Early Reading Diagnostic		Sum of Squares	df	Mean Square	F	Sig.
Level 1	Between groups	4246.67	2	2123.33	2.42	0.095
	Within groups	76443.33	87	878.66		
Level 2	Between groups	6095.56	2	3047.78	1.97	0.146
	Within groups	134736.67	87	1548.70		
Level 3	Between groups	4886.67	2	2443.33	1.83	0.166
	Within groups	116123.33	87	1334.75		
Level 4	Between groups	1768.89	2	884.44	0.99	0.376
	Within groups	77796.67	87	894.22		

As shown in Table 2, there was no statistical difference between Early Reading Diagnostic's mean scores in the control group as determined by the one-way ANOVA results. The overall changes in the mean score in Level 1, F (2, 87) = 2.42, $p > 0.05$ is not significant. Similar results were shown in the Level 2 mean score F (2, 87) = 1.97, $p > 0.05$, Level 3 mean score F (2, 87) = 1.83, $p > 0.05$, and Level 4 mean score

F (2, 87) = 0.99, $p > 0.05$. As a result, the Levels 1, 2, 3, and 4 mean scores differences are not significant since all its p-values are greater than .05. The analysis has revealed that participants in the control group did not show the effect of learning English early reading.

In the Intervention group, the mean scores of Level 1 pre-test, post-test, and post-test 2 are 55.00, 91.33, and 87.00, respectively, while its standard deviations are 23.89, 26.49, and 26.28, respectively. The Level 2 pre-test, post-test, and post-test 2 mean scores are 22.22, 93.33, and 85.67, while its standard deviations are 25.82, 25.37, and 23.59, respectively. Level 3 pre-test, post-test, and post-test 2 mean scores and standard deviation are (M = 8.00, 74.00, 66.33) and (SD = 14.72, 42.07, 38.73), respectively. Level 4 pre-test mean score is 3.67, post-test mean score is 84.33, and post-test 2 mean score is 75.33. Its standard deviation showed 9.64, 29.67, and 28.01 for pre-test, post-test, and post-test 2, respectively.

Table 3

Differences in early reading diagnostic Levels 1 to 4 of the intervention group

Early Reading Diagnostic		Sum of Squares	*df*	Mean Square	*F*	Sig.
Level 1	Between groups	23628.89	2	11814.44	18.06	0.000
	Within groups	56926.67	87	654.30		
Level 2	Between groups	91108.89	2	45554.44	73.20	0.000
	Within groups	54140.00	87	622.30		
Level 3	Between groups	78175.56	2	39087.78	33.64	0.000
	Within groups	101096.67	87	1162.03		
Level 4	Between groups	117242.22	2	58621.11	100.04	0.000
	Within groups	50980.00	87	585.98		

There was a statistically significant difference between the early reading diagnostic scores in the intervention group as determined by the one-way ANOVA results (Table 3). The overall changes in the mean score of Level 1, F (2,87) = 18.06, $p < 0.05$ is significant. The same results were shown in the Level 2 mean score F (2,87) = 73.20, $p < 0.05$, Level 3 mean score F (2,87) = 33.64, $p < 0.05$, and Level 4 mean score F (2,87) = 100.04, $p < 0.05$. As a result, the Levels 1, 2, 3, and 4 mean scores differences are significant since all of Table 3's p-value ($p = 0.000$) is less than 0.05. The analysis has revealed that Early Reading Games using the Integrated Sound Word Method showed a significant effect in improving early reading proficiency among participants in the Intervention group. Therefore, the results have confirmed Hypothesis 1 as postulated in this study.

Table 4

Multiple comparisons overall changes by time of early reading diagnostic Level 1 to 4 of the control group and intervention group

Group	Early Reading Diagnostic	Time	(J) Time	Mean Difference (I – J)	Standard Error	Sig.
Control Group	Level 1	Pre-test	Post-test	-16.667	7.654	0.081
		Pre-test	Post-test 2	-10.333	7.654	0.372
		Post-test	Post-test 2	6.333	7.654	0.687
	Level 2	Pre-test	Post-test	-19.000	10.161	0.154
		Pre-test	Post-test 2	-15.333	10.161	0.292
		Post-test	Post-test 2	3.667	10.161	0.931
	Level 3	Pre-test	Post-test	-16.667	9.433	0.187
		Pre-test	Post-test 2	-14.333	9.433	0.287
		Post-test	Post-test 2	2.333	9.433	0.967
	Level 4	Pre-test	Post-test	-10.000	7.721	0.402
		Pre-test	Post-test 2	-8.667	7.721	0.503
		Post-test	Post-test 2	1.333	7.721	0.984
Intervention Group	Level 1	Pre-test	Post-test	-36.333*	6.605	0.000
		Pre-test	Post-test 2	-32.000*	6.605	0.000
		Post-test	Post-test 2	4.333	6.605	0.789
	Level 2	Pre-test	Post-test	-71.000*	6.441	0.000
		Pre-test	Post-test 2	-63.333*	6.441	0.000
		Post-test	Post-test 2	7.667	6.441	0.462
	Level 3	Pre-test	Post-test	-66.000*	8.802	0.000
		Pre-test	Post-test 2	-58.333*	8.802	0.000
		Post-test	Post-test 2	7.667	8.802	0.660
	Level 4	Pre-test	Post-test	-80.667*	6.250	0.000
		Pre-test	Post-test 2	-71.667*	6.250	0.000
		Post-test	Post-test 2	9.000	6.250	0.325

Note. *The mean difference is significant at the 0.05 level

It is a comparative analysis to investigate further and determine which groups have significantly improved early reading proficiency in each level through Tukey Post-Hoc Multiple comparing the overall changes by time between pre-test, post-test, and post-test 2. Table 4 shows the mean differences of pre-test, post-test, and post-test 2 of Levels 1, 2, 3, and 4 for the control group and the intervention group. As shown in the control group, the significant values for all tests between pre-test-post-test, pre-test-post-test 2, and post-test-post-test 2 for Levels 1, 2, 3, and 4 are greater than 0.05 level of significance, which means that there are no significant differences in the mean scores. On the other hand, the Intervention group showed

significant values of $p = 0.000$ for pre-test-post-test and pre-test-post-test 2 for Levels 1, 2, 3, and 4, which are smaller than the .05 level of significance. It means that there are significant differences in the mean scores. The significant values for post-test-post-test 2 Levels 1, 2, 3, and 4 of the intervention group are $p = 0.789$, $p = 0.462$, $p = 0.660$, $p = 0.325$, respectively, which are greater than 0.05 level of significance. It suggests no significant differences in the mean scores in post-test and post-test 2. The findings thus show that the Intervention group performed better in improving early reading proficiency through games as compared to the control group in each level. These findings are also consistent with the hypothesis of H2 proposed according to the previous literature. Therefore, the participants in the Intervention group can grasp early reading proficiency after learning through Early Reading games using the Integrated Sound Word Method.

DISCUSSION

The quality of the preschool curriculum has to be maintained at the highest level to ensure that preschoolers gain the utmost benefits during their early childhood years (Qin & Md Nor, 2018). A few factors contributed to the growth of preschoolers' ability to learn English through early reading games. Through Early Reading Games, the Integrated Sound Word Method used a balanced approach as the primary teaching instruction. The games improved early reading comprehension by sharpening the children's decoding skills with pictures to comprehend. This approach is consistent with the 'Simple View' theory, which states that R = C x D leads to R = 1 x 1 = 1, implying that the preschoolers have successfully acquired reading comprehension skills (Wren, 2000). By the end of the intervention program, the findings show that preschoolers had mastered Level 4 of early reading comprehension and improved their English language proficiency.

In addition, preschoolers were divided into large and small groups based on explicit and implicit instructions. Preschoolers interacted with the preschool teacher or peers in each early reading game. This social learning approach has encouraged preschoolers to learn together and assist one another in moving on to the next level. As a result, it made classroom learning more enjoyable and meaningful. This interpretation is related to several early literacy studies and theoretical approaches. The findings of this present study are supported by Yamat et al. (2014), who claimed that the learning environment impacts children's holistic development by providing exposure and opportunity to use the English language. Students feel confident in speaking the English language when they feel supported by teachers and peers (Yamat et al., 2014). Furthermore, active learning in the classroom increases students' understanding of the English language and improves their English language performance because a conducive and non-threatening classroom environment can evoke and retain the students' interest in learning the language (Ibrahim et al., 2015).

Living in a multicultural country like Malaysia, acquiring the English language requires different approaches compared to the acquisition of the student's native language (Ramlan & Maarof, 2014). English teachers must tolerate the student's cultural and social backgrounds as this will contribute to their attainment of English language proficiency (Ramlan & Maarof, 2014). It is a challenging task for the teachers as many Malaysian parents are worried that when their children learn the English language, they will lose their mother tongue proficiency, culture, and national identities (Musa et al., 2012; Mustafa & Azman, 2013). One of the ways to remediate this issue is to integrate local contexts into the early reading games to create a meaningful learning experience for preschoolers and allow them to relate their learning to the world around them.

Furthermore, the findings of this study support Jean Piaget's perspective, who believed play is equivalent to children working with the experiences and taking control of the tasks they were doing (Samuelsson & Carlsson, 2008). It allows preschoolers to work independently and cooperatively in early reading with minimum assistance from the teacher. It also aligned with a study conducted by Fung and Min (2016), which found that games can promote turn-taking skills among students, allowing everyone to play equally and learn to cooperate as a team (Fung & Min, 2016). Whitehall and McDonald (1993) and Ricci et al. (1996), as cited in Garris et al. (2002), stressed that incorporating game features in learning instruction led to improved learning, which resulted in greater persistence on the task and led to greater attention to the content and greater retention (Garris et al., 2002). These skills create a learning environment incorporating cooperative learning, competition, excitement, curiosity, and creativity (Fung & Min, 2016).

In conclusion, this study has elicited a significant effect of early reading games to teach English using Integrated Sound Word Methods in preschools. It further supports the study by Lee (2012), who argued that implementing games aligned with the national curriculum and matched with specific learning objectives can be effective. It creates a meaningful teaching tool as students learn and generate a substantial amount of new vocabulary from the games (Lee, 2012). The results from this research study hope to bring awareness to the importance of using a balanced approach to achieve the objectives of the Ministry of Education (MOE) as stated in the Malaysia Education Blueprint (2013–2025), where all students are "expected to acquire knowledge, high thinking skills, leadership skills, bilingual proficiency, ethics, spirituality, and national identity" (Ministry of Education Malaysia, 2013, p. 30).

CONCLUSION

In conclusion, this study aimed to examine the effectiveness of early reading games in teaching English to second language learners in preschools using the Integrated Sound Word Method. The results indicate that the intervention group improved their

early reading proficiency through games significantly better than the control group. The participants in the intervention group were able to grasp early reading proficiency after learning through early reading games using the Integrated Sound Word Method. This study supports the notion that a balanced approach to reading instruction can be beneficial for achieving the objectives of the Malaysian Education Blueprint. It is suggested that the Integrated Sound Word Method, which incorporates early reading games, can be an effective method for teaching English to second-language learners in preschools. These findings may have important implications for educators and policymakers in developing effective reading instruction programs for second language learners. Further research is needed to explore the long-term effects of the Integrated Sound Word Method and compare its effectiveness to other reading instruction approaches in the Malaysian setting.

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Impact and Role of the Public Realm in Creating More Socially Cohesive Communities: A Case Study of Urban Pattern in Almaty, Kazakhstan

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ABSTRACT

Over the last three decades, there has been a notable transformation in urban growth patterns in Kazakhstan's large cities, particularly in Almaty. While this can be traced back to market-oriented planning agendas, the increasing fragmentation of the public realm in cities can be linked to the recent residential development projects. The rise of these projects in post-Soviet neighbourhoods is often criticised due to their typology, as developers create them as gated communities. These patterns' socio and spatial fragmentation is associated with fewer opportunities for social interaction between Soviet neighbourhoods and the more recent exclusive communities. Therefore, this paper investigates the key issues present in the urban patterns of Almaty city that can hinder the creation of a more cohesive society. It presents a case study of other Soviet-developed neighbourhoods with similar development patterns. The study's methodology includes morphological mapping, observation of the use of the public realm and a survey of residents to support the findings. The investigation focuses on one of the typical urban patterns of mixed-use Soviet neighbourhoods and recent urban residential blocks, where an opportunity lies for perspective communities. The research reveals a lack of social cohesion between local communities due to mono-functional land use, poor permeability and accessibility that fragmented the city into closed neighbourhoods. The research dives into the core issues of Soviet and post-Soviet urban morphology's outcomes in the public realm and the impact on social life in these neighbourhoods.

Keywords: Almaty, development projects, public realm, social cohesion, urban pattern

INTRODUCTION

Kazakhstan's large cities have undergone significant urban transformation over the past three decades, with changes in the urban planning system from the Soviet to the post-Soviet era. Recently, Almaty City, often described as the financial capital of Kazakhstan, has experienced a surge in newly developed large residential projects. In parallel, concerns are rising about how these investment-oriented developments in these large cities address the social cohesion between the newly formed communities and the existing ones living in the surrounding neighbourhoods built during the Soviet period. Urban transformation and new development projects have become a stage of tensions between the interests of the different social, political, and economic groups (Powell, 2011). Brenner et al. (2010) state that most global 'high-class' and 'business-class' development projects aim to sustain investment-oriented agendas that allow profit-driven parties to park investments for further market and sale purposes in large cities. Despite the 'world-class' image of development projects, tensions in creating more socially cohesive communities increase between existing communities and potential owners of real estate (Ghertner, 2015). Such projects result in fragmented urban areas with exclusive residential blocks, creating a divide between the new and old neighbourhoods, both spatially and socially. Inam (2014) claims this has intensified criticism of those involved in these processes, including developers, local authorities and traditional

practitioners globally. Tonkiss (2013) proposes carefully considering the public realm to address this as it can improve social cohesion in these areas.

While notions of sustainable communities and the phenomenon of exclusive and gated communities are widely discussed in academic research, including urban planning management, development processes and the economic effect of new development projects, there is still limited investigation into the role of the public realm in urban morphology. In particular, it can bridge the divide between segregated metropolitan areas within the context of recent development projects built in existing urban Soviet neighbourhoods. Whereas market-led ideologies have already shaped many urban developments in Almaty city since the 1990s, one of the urban patterns provides a unique opportunity to analyse the public realm outcomes through the lens of a socially cohesive community.

This study aims to provide a more comprehensive urban design assessment for what allows for a "socially cohesive community" to be formed, focusing on two neighbourhoods in Almaty. The research will examine the notion of "cohesive community" concerning urban design transformation and its outcomes in Almaty's public realm. It will be explored through three main research questions. Firstly, is the selected site fragmented into different disconnected communities, and what is the core issue of such urban transformations? Furthermore, is the public realm of recent post-Soviet neighbourhoods and

communities open to the urban context of the Soviet period? Thirdly, what value does it bring to local communities regarding social cohesion? The research aspires to extend the knowledge about the role of the public realm in enhancing social cohesion in diverse neighbourhoods. The findings could help urban designers, local communities, and authorities understand how implementing urban changes transforms areas and how these can be best applied to create more inclusive neighbourhoods, both socially and spatially.

Theoretical Framework

Closed/Open Community. In urban research and studies, a correlation between the physical design of cities and the nature of communities residing within them has long been established. Historically, the Charter of Athens Manifesto was one of the most prominent texts that popularised the notion that the physical design of cities can help achieve a more humane, healthy, and liveable urban environment. Urbanists developed it as a response to physical decay and social inequalities in the towns of that time. However, these urban planning principles resulted in modernist zoning and overdetermination that failed to provide suitable solutions and increasingly emphasised the need to understand urban patterns that can create liveable environments (Jacobs & Appleyard, 1987). In the 1980s, they proposed an urban manifesto that is still applied nowadays in large cities. Kozhakhmetov and Abilov (2022) criticise such urban

planning approaches for concerning only problems and overlooking the social or physical aspects of those urban patterns that local people often put more value on. The criticism arises from the observation that these planning principles have led to the emergence of isolated districts in large cities, homogeneous communities, large-scale urban blocks and patterns that hinder social exchange (Carvalho & Netto, 2022). As a result, these urban patterns have become less adaptive in most cases, diminishing their ability to evolve into socially cohesive and liveable communities.

King's Cross Regeneration is a relevant precedent of a privately owned public realm developed by the King's Cross Partnership (KCP) investment company (Hallsworth & Stephenson, 2010). In 1996, the establishment of KCP aimed to support its stakeholders, including London and Continental Railways and Royaltrack, in the urban revitalisation of Camden and Islington Boroughs, operating within the framework of the Single Regeneration Budget. In 2000, Argent was chosen as the developer of the King's Cross Regeneration project (Madelin & Porphyrios, 2008). This regeneration project covers an area of 27 hectares and was estimated to cost a total of £3 billion at completion (Bishop & Williams, 2016). Currently completed and in operation, it is entirely privately owned and managed. These include parks, streets, open spaces and courtyards within the site (Imrie, 2009). Initially, Argent-St (2001) promised that "the public realm will underpin the success of these land uses". Although the

area was identified as an "Opportunity Area," meaning a significant location with development opportunities, Camden Council (2004) claimed that their goal was "to avoid the development of an exclusive 'ghetto'…we want to see and create a balanced and successful development" (p.8). Despite the developer carrying consultations and negotiating with 7500 different people from different interested parties and the existing local communities (Moore, 2014), Edwards (2009) asserts that the project did not live up to its ambitions. He claims that the public realm "are supervised and regulated spaces for consumption" with strict guidelines, with examples of visitors being ejected by security staff.

Inam (2022) points out that allowing individuals or collectives access to a public realm where they can exert some sense of ownership can promote social cohesion in the communities occupying those spaces. Accessible public spaces encourage diverse social groups to participate in community and public life (Talen & Sungduck, 2018). On an urban level, elements of urban form such as mixed land use, high-dense urban developments, and diversity of everyday facilities have enhanced social exchange (Wilson, 2005). In terms of the physical characteristics of the public realm that promote the creation of cohesive communities, these include safe and clean streets, accessible and permeable to all neighbourhoods mainly for pedestrians, and facilities with a night-time economy that sustains liveable streets, providing "eyes on streets", hence a sense of security. However,

it is essential to note that these physical spatial requirements do not guarantee success in achieving open communities without community involvement in urban transformation processes. Balestrieri (2013) reinforces the idea of community participation as key to achieving a public realm that serves local communities, as this needs to be emphasised in how stakeholders deal with "the concept of power as responsibility, but also transparency, retraceability and participation in decision-making" (p.57).

It is essential to understand that cities are rapidly changing, not only in size and expansion but also due to changing demographics with diverse cultural and socioeconomic groups. Sennett (2010) asserts that the population of large cities grows whereas the urban fabric expands. He advocates for cities to be more open, not only socially but also spatially, with physical interventions in urban contexts. Sennett (2010) highlights the importance of a public realm at the edges between different urban neighbourhoods and development projects. These can create bridges on the edges of other communities, giving opportunities to residents for chance encounters and social exchange, especially to people from different social backgrounds, while making them more cohesive (Talen & Sungduck, 2018). Thus, socially cohesive communities could be envisioned as open societies that allow for social communication between neighbourhoods, where the public realm plays a crucial role in allowing these processes to emerge.

Community and Public Realm. Contemporary cities represent a diverse social mix in various forms of difference and the relationship between these people, groups and communities (Young, 2010). Consequently, all the opportunities to engage people and sustain relations between different people lay in the public realm. There is a distinction between public space and the public realm. Spatially, politically and socially, we think of public space in the city as bounded and defined spaces such as squares, plazas, courtyards, and parks. The public realm, on the other hand, consists of interconnected spatial networks that include these public spaces intertwined with political structures but reach beyond to include mundane and widely utilised spaces like sidewalks and paths created by the movement of people (Inam, 2022).

Moreover, Lofland (2017) claims that a public realm has not only geography but also history and culture, such as ethical and behavioural norms and values, as well as different kinds of relationships among its participants, including positive and negative. All aspects of the public realm are what cities represent currently. Inam (2022) states that the public realm's performative role is vital for providing accessible activities to individuals and communities. Furthermore, the public realm's key role is to increase chances for strangers to meet each other there (Sennett, 2010). He argues for designing the public realm as a process rather than a complete form of architectural and urban objects. It is because, in an open community, the public realm could be colonisable by diverse social groups to dwell without differences.

While Middleton (2008) points out that the social exchanges in a public realm are verbal and visual, Young (2010) claims that a public realm starts to perform when citizens appear and meet each other. These forms of interaction could be expressed by appreciation, entertaining each other, communicating, and engaging different cultures and individuals (Middleton, 2008). Talen and Sungduck (2018) highlight the importance of social diversity in terms of social status or race and age, cultural, and interest differences. Moreover, the public realm does not necessarily work to acquaint strangers. Still, it allows them to gather around different interests and facilities in the public realm while improving ties within society (Felder, 2020). Klinenberg (2016) claims that children are more open to social interaction through playing in a playground while creating ties for them and their parents. Consequently, parents with diverse backgrounds choose what to share with other participants of an open community, creating new social ties and improving social exchange and interaction while preserving segregation between communities (O'Brien et al., 2000). These third places, such as streets, alleys, boulevards, squares, and parks, not only provide physical ground but they help to improve community building and impact the perception of their quality of life (Jeffres et al., 2009). Overall, the public realm concept should be designed to be comfortable spatially for all citizens to allow different social ties.

A socially cohesive public realm emerges in districts with active public realm life. Firstly, socially active public realms are well-connected and accessible to other streets while creating flows of people there, providing eyes on streets, especially tonight (Jacobs, 1961). The psychological feeling of safety strengthens in districts with well-lighted streets guarded by CCTV cameras and in a socially active public realm. Secondly, Dovey and Pafka (2018) claim that urban patterns with overlapped functions tend to be socially active. Liveable public realms could not be active without facilities and a functional mix of the district and ground night-time economy (Dovey & Pafka). The night-time economy helps to sustain eyes on streets

and daily use facilities that attract people to walk there (Minton, 2012). Thus, the vitality of daily facilities people use is critical. Thirdly, the priority of walkable streets is vital in liveable communities because, according to Aelbrecht and Stevens (2019), walkable streets intensify social life in neighbourhoods, making them more secure while creating ties between participants and improving social cohesion. The meaning of a socially cohesive community in the paper is essential to analyse the public realm and urban patterns of Soviet and post-Soviet neighbourhoods on a small scale, which respond to large-scale urban issues with analogical backgrounds in relation to a functional mix analysis shown in Figure 1.
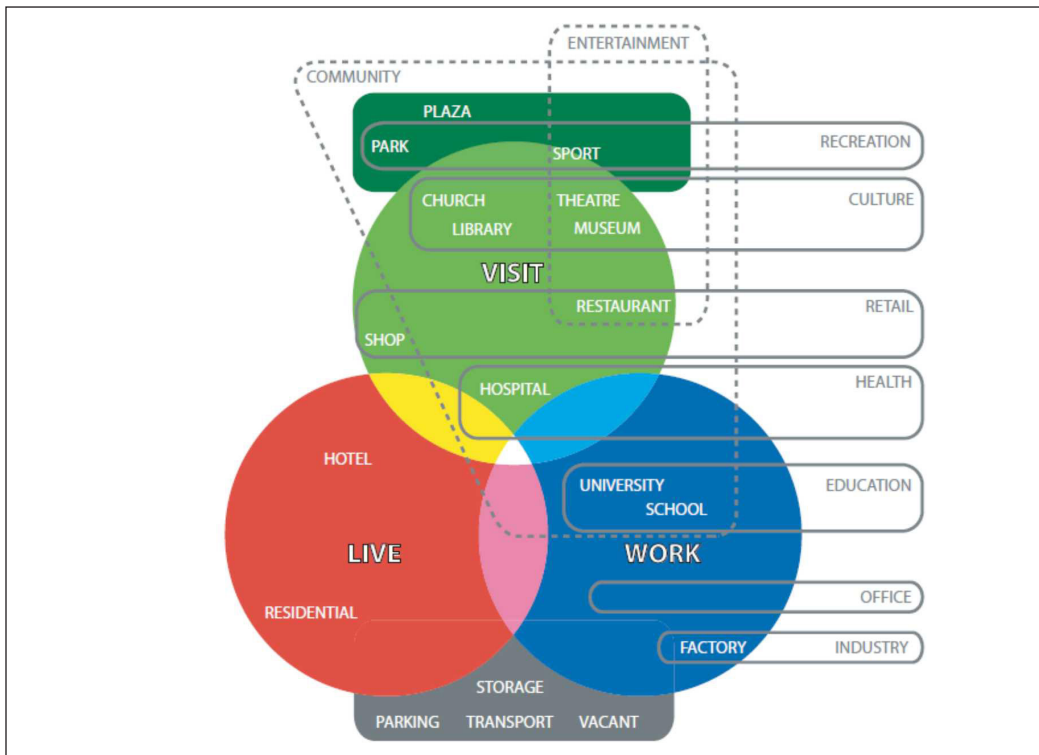
Figure 1. Overlapping functional mix triangle (adapted from Dovey and Pafka, 2018)

METHODOLOGY

The methodological approach applied in the study is based on both the analysis of the urban context and theoretical concepts. Context analysis includes the analysis of the selected site and its urban morphology, observations, photography, and a survey. The morphological mapping is used to analyse land use, everyday facilities, functional mix, and housing height and age of the urban area. The site analysis includes observation of sports and kids' activity facilities, greenery, and night-time safety within the area's public realm. Theoretical concepts are based on a theoretical framework of urban design scholars, such as Jacobs (1987), Inam (2022), Felder (2020), Middleton (2008), and Talen and Sungduck (2018), illustrated in Figure 2.

The morphological mapping of the study area is a tool used to respond to the research questions through visual representation of an urban form. Dovey and Ristic (2015) suggest that morphological mapping helps to produce new ways of seeing, understanding, planning and designing the city. According to Soviet-based local urban planning regulations (Maloyan, 2004), mapping and analysing land use allows the visualisation of the site's division into different areas, such as residential, industrial, administrative, and recreational. The everyday facility analysis complements the land use map by highlighting active zones within the areas. The active zones show where potentially high flows of people are located or can emerge. As Jacobs (1961) particularly
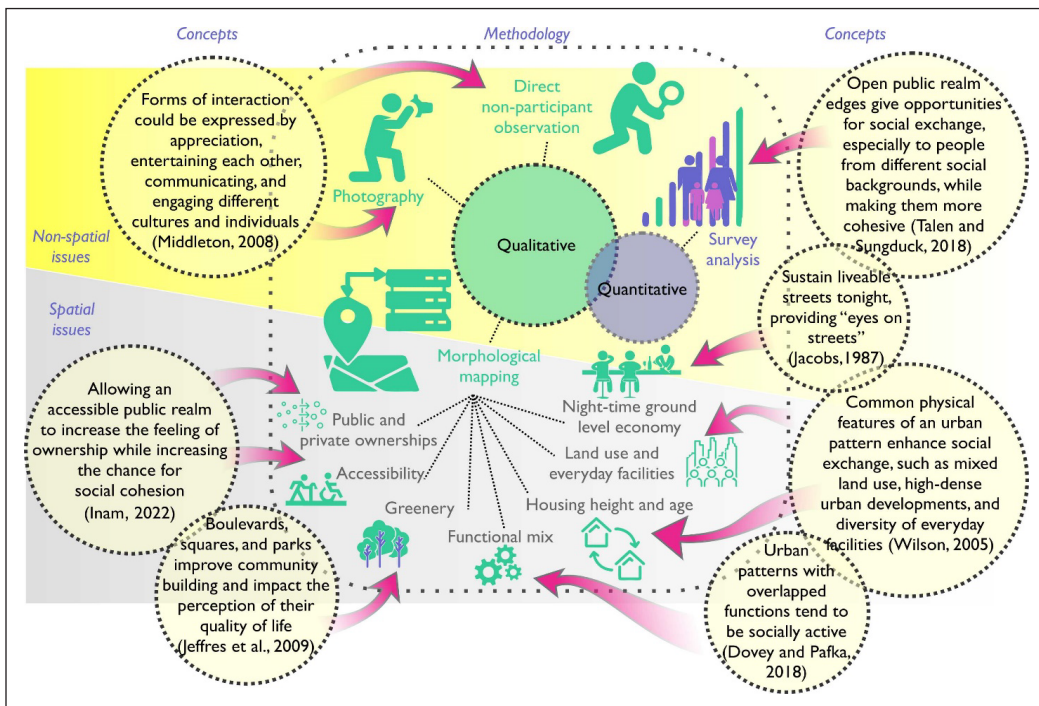
Figure 2. Framework for the relation between theoretical concepts and research methodology

highlights, local small shops, cafes and daily visit spots often serve as a stage for social exchange and interactions. The analysis of housing age and building height illustrates the contrast between Soviet and post-Soviet urban forms. The construction of functional mix analysis is adapted and based on the overlapping functional mix triangle (Dovey & Pafka, 2018).

The analysis of greenery in Soviet neighbourhoods and post-Soviet areas aims to show the environmental quality of public realms. Wood et al. (2017) highlight the vitality of the ecological quality of an urban space in attracting local communities to use it. Analysis of public and private ownership mapping in the public realm concerning its accessibility is adapted from Pafka and Dovey (2017) to demonstrate the site's fragmentation and cohesion between different communities within the study area. Analysis of playgrounds and sports facilities are designed to illustrate potential vital areas that might allow social exchange between diverse communities (Felder, 2020). Night-time ground economy analysis complements Jacobs's (1987) theory of providing "eyes on streets," specifically during late hours. Local communities' perception of a public realm will be analysed through the lens of a cohesive community to support the other investigative methods, as residents have personal experiences of the public realm as they inhabit it for extended periods. Additionally, the use of the public realm will be studied with non-participant observation and photography. This method will provide insight into how the spaces are

used: the selected site's streets, courtyards, playgrounds, and pathways.

The anonymous survey method collects the locals' responses to compare and sustain the results of morphological mapping and observations. The survey framework is based on the questionnaire principles of Abilov (2015) to show the contrast between Soviet and post-Soviet neighbourhoods and their use of the public realm. According to calculations through 2GIS, the selected residential development Baytal and Soviet housing blocks are occupied by approximately 1120 residents. Due to time limitations, the survey was conducted from 2021 October 20 to 2022 April 22. Authors could reach local communities by visiting the site and directly communicating with residents. However, the filled questionnaires were mainly received via WhatsApp chats of residents. Overall, 50 filled questionnaires were received, representing 5% of the total residents, the recommended minimum for generalising results within the study constraints. Due to ethical considerations, limitations included communication and discussions with psychologically vulnerable and underage community groups.

All survey points are designed to respond to the research questions. First, satisfaction with living conditions will demonstrate which neighbourhood is comfortable overall in terms of apartments and housing. Secondly, the average frequency of using everyday facilities in the residents' living blocks or residential development and neighbourhood communities per month will help to identify the active zones and support functional mix

mappings. Gaging the residents' experiences with difficulties accessing a public realm within the selected study will allow us to study if the neighbourhoods are spatially cohesive. It will be complemented by public and private ownership and accessibility mapping. Satisfaction with public realm facilities such as landscaping, playgrounds, sports equipment and greenery reveals if the public realm is welcoming to use. Thirdly, the question of how residents experience night-time walks will help to gain insight into the sense of security in the public realm, as per Jacobs's theory (1987) of having "eyes on streets". Finally, the frequency of interaction with neighbours and strangers within a residential development or standard courtyard blocks and respondents' feeling of open community will illustrate how far Soviet and post-Soviet communities are cohesive.

RESEARCH BACKGROUND

Historically, Kazakhstan had the status of a satellite country in the hierarchical economic system of the Soviet Union, with priority to particular forms of industry or other economic drivers up to the 1990s. As a result, most towns in satellite countries were designed with a similar approach, ignoring regional and local identities. In such a rigid system, urban planning principles applied an approach to the functional division of cities by dividing them into different zones, e.g., residential, industrial, and recreational areas (Maloyan, 2002). Cities were separated into spatial units comprising "micro-districts" within a designated area. A typical micro-

district was functionally divided into apartment building blocks, a school, a kindergarten, and service businesses along primary highways (Sarzhanov & Schurch, 2023). However, the functional zoning within micro-districts did not provide a functional mix within the building blocks. For example, instead of small shops next door on the ground floor, there were only large shopping centres for several micro-districts. Although these micro-districts were designed to be accessible and permeable as open neighbourhoods, their urban design layouts replicated typical blocks, disregarding street life vitality and ground floor economy. In contrast, the post-Soviet areas were designed as high-rise and high-density blocks with commercial facilities. However, almost all post-Soviet neighbourhoods are designed as gated and fenced neighbourhoods.

Almaty is one of the highly urbanised historical cities in Kazakhstan. The city is considered the economic and financial capital of the country. The indicator of the gross regional product demonstrated high numbers, which is approximately 11% of the whole republic (Alibekova et al., 2018). While the city's urban pattern has been evolving since the mid-19th century, the city rapidly expanded during the Soviet Union era (Khodzhikov et al., 2022). Urban transformations were possible due to precast typical building blocks replicated in urban brownfields (Zhunussov, 2019). The selected research site was partially developed in the 1970s, close to a university established as a new educational core of the area (Figure 3).
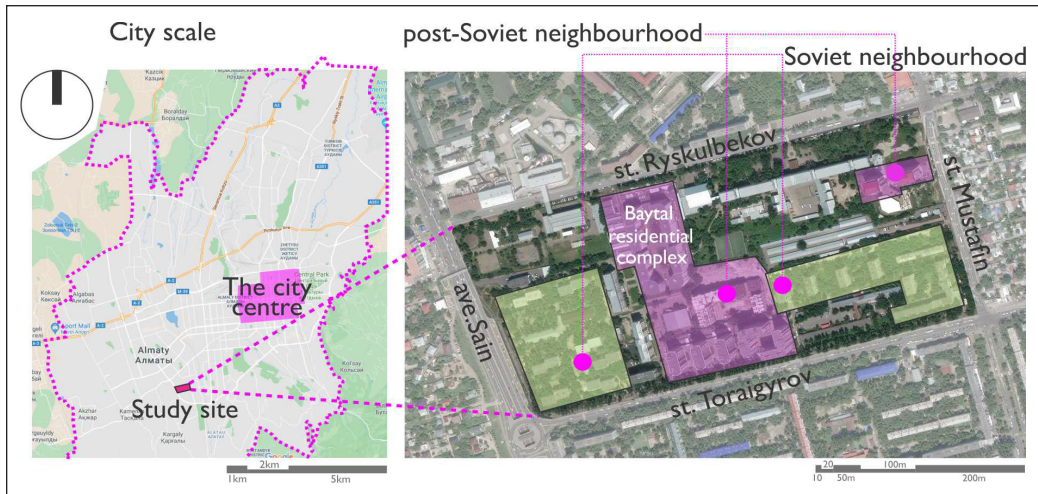
Figure 3. Location of the selected study area (adapted from Google, 2022)

The investigation area is on Almaty's southwest side. The selected area is part of the "bedroom communities" west of Almaty. The area has been transformed into a mix of typical Soviet Union housing blocks and post-Soviet contemporary residential developments. The study focuses on these two neighbourhoods on the site. Firstly, the recent residential blocks, such as Baytal, are considered a market-oriented development project. Secondly, the Soviet neighbourhood demonstrates a regional urban pattern due to its historical context. The site sits in a fragmented urban context with diverse local communities. These differences make the selected site valuable for studying outcomes of Soviet and post-Soviet urban design principles.

FINDINGS OF THE STUDY

The selected site analysis represents a test bed for urban transformations and outcomes in the public realm. It is critical to investigate the area in depth to understand the consequences of urban modifications, as all physical interventions in a public realm are layered and should be studied separately through the lens of an open and closed community and the notion of a cohesive community. The study's results represent current urban challenges that can be found in similar metropolitan areas with similar growth and expansion patterns and hence be applied to different urban contexts. The findings reveal existing urban planning issues of land use and everyday facilities, building heights, housing age, functional mix, greenery, children's playgrounds and sports facilities, accessibility and permeability, public and private ownership, night-time safety, and night-time ground economy.

The land use analysis illustrates that 43% of the area is residential, although three main spots have educational facilities, such as private universities and schools. For example, in 2014, the university owners sold the football field to a property company to

build Baytal residential blocks (Sarbasova, 2021). It suggests that the educational area was replaced by more profit-oriented land use. Koolhaas (2007) summarises this concept of evolving urban environments, suggesting that «if there was nothing, now they are there; if there were something, they have replaced it.» This discourse reflects how modern cities are ruled and work. It has been evidenced that urban land holds significant value when built with profit-yielding functions in the area. While the financial value of brownfield and abandoned lands increases, urban form has become denser with multifunctional residential developments (Minton, 2017). Therefore, the site possesses speculative market potential for future construction of high-rise and dense developments (Figure 4).

The mapping of housing age demonstrates that over half of the site's housing blocks were built after the 1990s. The recent developments started emerging after 2005 and are considered new communities, including Baytal residences. As seen from modern housing blocks, developers handle the design of urban patterns and change after their own. The differences in urban planning principles between socialistic and market-led approaches are evident. Over time, core urban planning principles were replaced with market-oriented residential developments prioritising investors' profits.

The analysis of building heights demonstrates that the area's blocks are divided into high-rise and low-rise parts. The central part of the area, built by developers, has twelve to sixteen-storey tower blocks
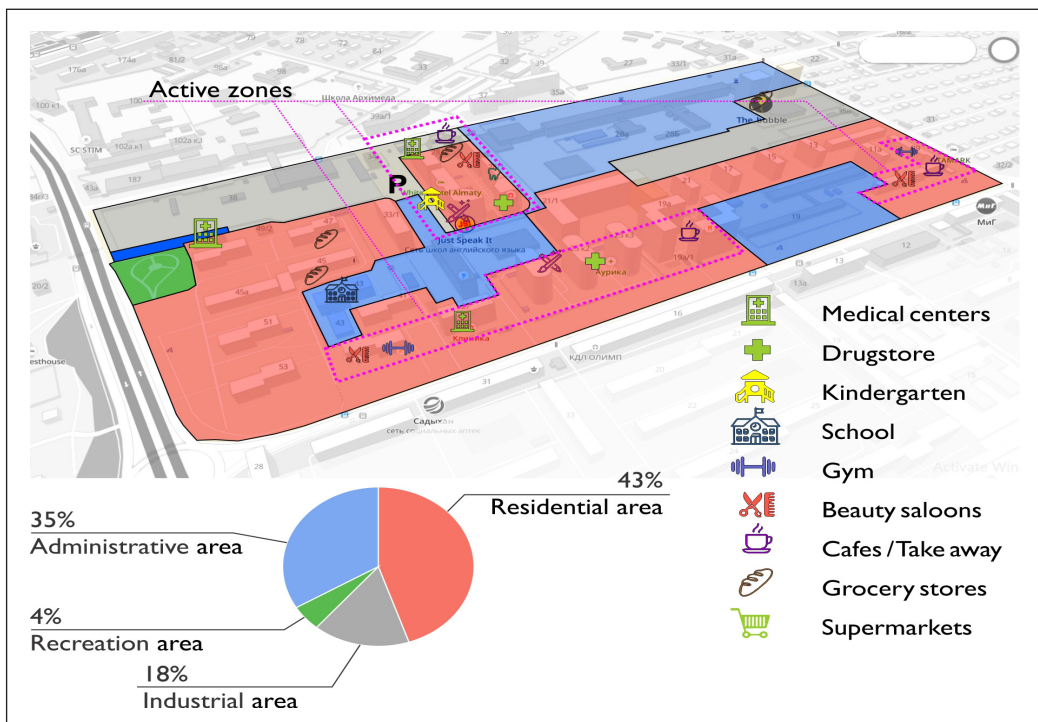
Figure 4. Land use and everyday facilities analysis (illustrated on 2GIS, 2022)

by developers. In contrast, yellow-coloured parts are dominantly Soviet housing blocks with up to nine storeys. It suggests that the density and quantity of residents are much higher in the recently developed housing blocks, whereas old housing blocks have fewer dwellers. Consequently, the heights of the recent residential developments, such as Baytal residential blocks, are getting significantly higher (Figure 5).

The functional mix analysis identified 68.4% of the land as mono-functional. All mono-functional buildings were designed before the 1990s with Soviet urban design approaches, which proposed dividing the area into distinct functions, such as living, work or recreation. Modern market-oriented residential developments have a more functional mix present. Nevertheless, work and live functions significantly outweigh the visit functions in the research area. The mapping highlights that Soviet parts are mono-functional, as illustrated in Figure 6. The challenge of the lack of a functional mix does not facilitate diversity in the public realm (Dovey & Pafka, 2018). It fails to provide opportunities for community building and strengthening social ties (Talen & Sungduck, 2018).

Sennett (2010) asserts that equity in accessing public spaces may have psychological outcomes, as some interests might be favoured over others. Therefore, potential design strategies should consider increasing equity through greenery to attract local communities for social interaction. Greenery analysis shows public realm vegetation is denser in Soviet neighbourhoods (Figure 7). Although they are densely vegetated, there is no maintenance (Figure 8a). Recent developments only have a few green spots and vast hardscape areas. Baytal residential blocks have almost no green spaces that
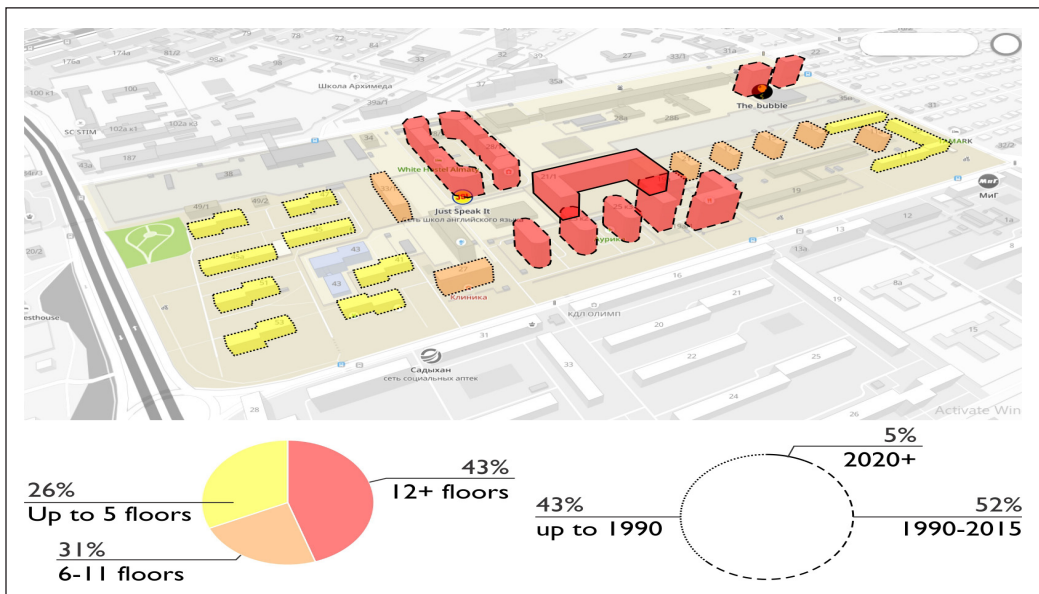
Figure 5. Housing age and building height analysis (illustrated on 2GIS, 2022)

could be used as public open spaces for leisure. Lack of greenery is a common issue for large development projects in Almaty as all public realm's underground spaces are used for car parking and paved on top, as evidenced in Figure 8b. Mainly, the public realm with hardscape does not facilitate people's daily use, while urban greenery is more welcoming for different social activities (Wood et al., 2017).
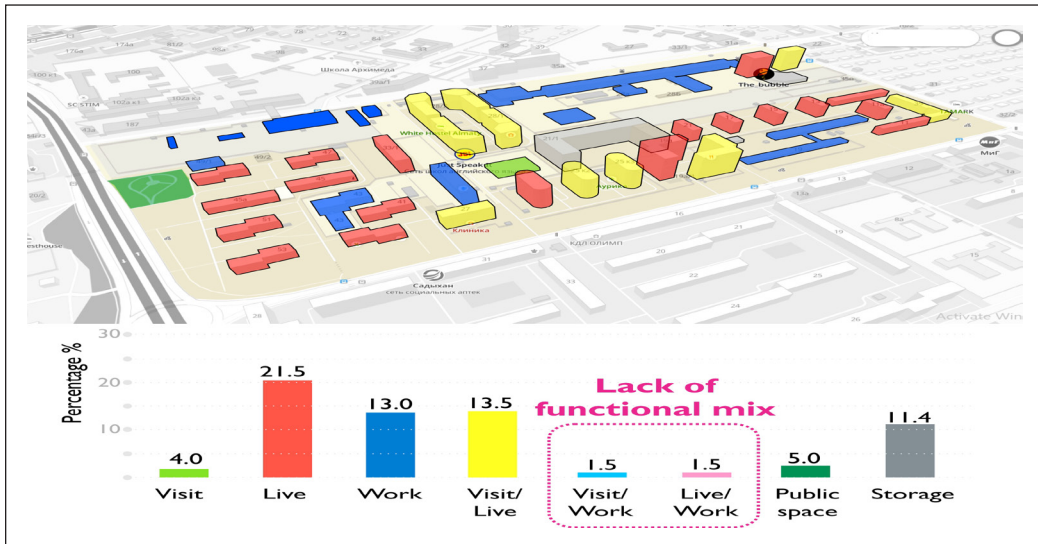
Figure 6. Functional mix analysis (illustrated on 2GIS, 2022)
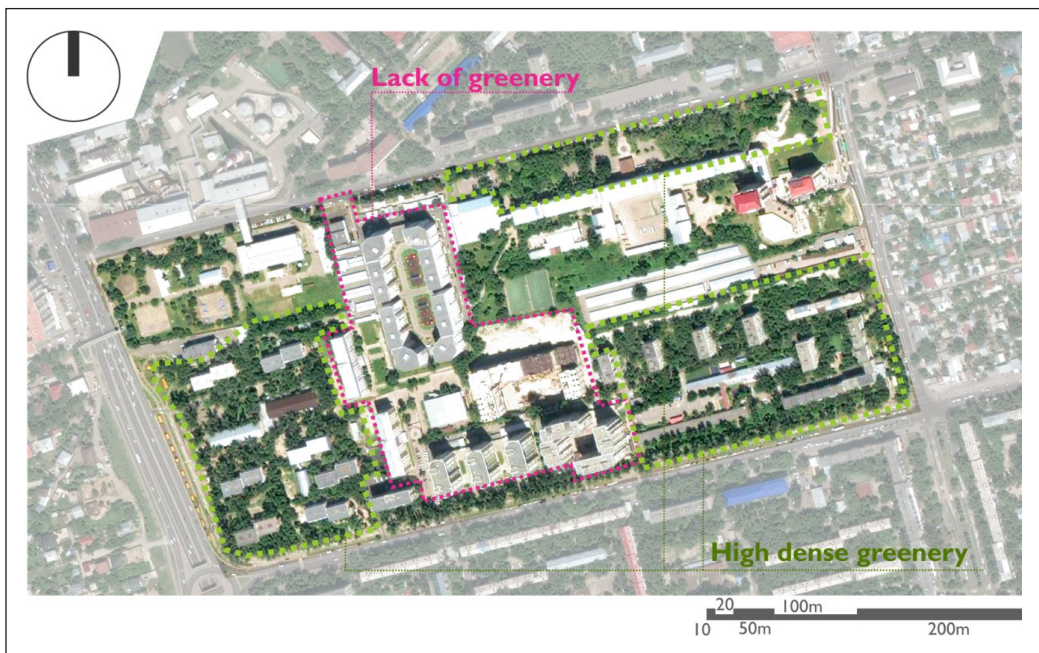
Figure 7. Analysis of greenery in Soviet and post-Soviet neighbourhoods (illustrated on Google, 2022)

(a) (b)

Figure 8. (a) Wild greenery in the Soviet neighbourhood; and (b) Lack of greenery in the post-Soviet neighbourhood

Analysis of public and private ownerships in the public realm and accessibility demonstrates that the public realm is designed poorly without consideration of the existing context and a cohesive strategy with the new urban development projects. A fenced public realm negatively impacts permeability, as edges and gated parts create closed communities and increase walking distances to reach from one place to another. The fragmented public realm creates a spatial and social separation between local communities. It can also lead to increased vehicle use due to inaccessibility, as walking through the site has become difficult. These problems are mainly due to the recent impermeable and closed residential developments (Jaafar et al., 2017). This analysis shows how contemporary urban market-led projects have led to socially isolated communities (Figure 9).

The issue of poor accessibility and permeability hinges on who owns the public realm and how it is controlled (Minton, 2017). Therefore, the analysis of public realm ownership demonstrates to whom the space belongs (Figure 9). Moreover, this extends the community's knowledge of how an area is controlled and whom it is designed for. Figure 6 illustrates that the old part of the selected site represents a publicly owned public realm. However, the public realm in the recent developments like Baytal residential blocks is privately owned. While land plots of educational and industrial facilities are private, the primary streets provide flexible public space and neighbourhood connections. The land ownership analysis demonstrates that the privately owned public realm is reserved for the residents in the gated communities. It suggests that these closed spaces cater to a need greater than social exchange with
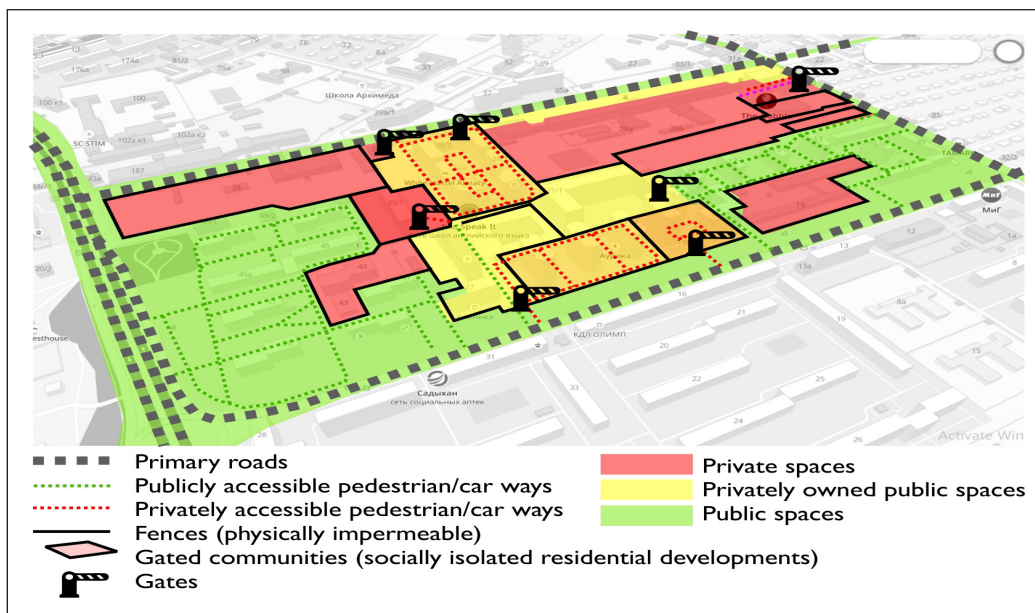
Figure 9. Analysis of public and private ownerships in the public realm and accessibility (illustrated on 2GIS, 2022)

outsiders as they are gated. It comes with restrictions and limited access to strangers. As a result, the urban context is fragmented into detached communities.

O'Brien et al. (2000) suggest that a «lack of attention to the different ways children use their cities will hinder advances in social policies designed to enhance participation for all children» (p.75). Moreover, Felder (2020) points out that children's social interaction helps parents acquaint themselves. It means the role of a child-friendly public realm can increase the chances of locals improving social cohesion and turning them into open communities. Observation of the public realm in terms of facilities that could be attractive for children illustrates that playgrounds and sports grounds are located evenly in old and recently developed parts. However,

their quality and size are incomparable due to different investment scales. While privately owned public realms in recent residential developments are equitable for children, no other attractions exist in the Soviet neighbourhoods' courtyards except a few playgrounds and sports equipment (Figure 10).

The analysis of the night-time economy complements the study of functional and everyday use facilities and illustrates that the area is mainly well-lightened, and only a few shops work until midnight. Despite well-lit streets, there is a lack of pedestrians who use the public realm in the evening. Most pathways are empty at night because there is a lack of a night-time economy. The lack of everyday facilities, functional mix and poor accessibility makes the inner part of the selected site less safe for night-time walking

(Dovey & Pafka, 2018). Thus, some parts of the area need to be more comfortable for night-time walking due to the lack of night-time ground economy (Figure 11). Although Jacobs (1961) suggests providing 'eyes on streets' for the psychological feeling of pedestrians' safety, there is a lack of people on the streets, especially deep in the area.

Profile of respondents briefly describes the respondents' gender, age-range and location on the research site. 88% of respondents are 26-65 years old. A quarter of respondents were aged 18 to 25 and above 65 years. Questioners were conducted in two parts of the selected study site. The first 25 respondents lived in the
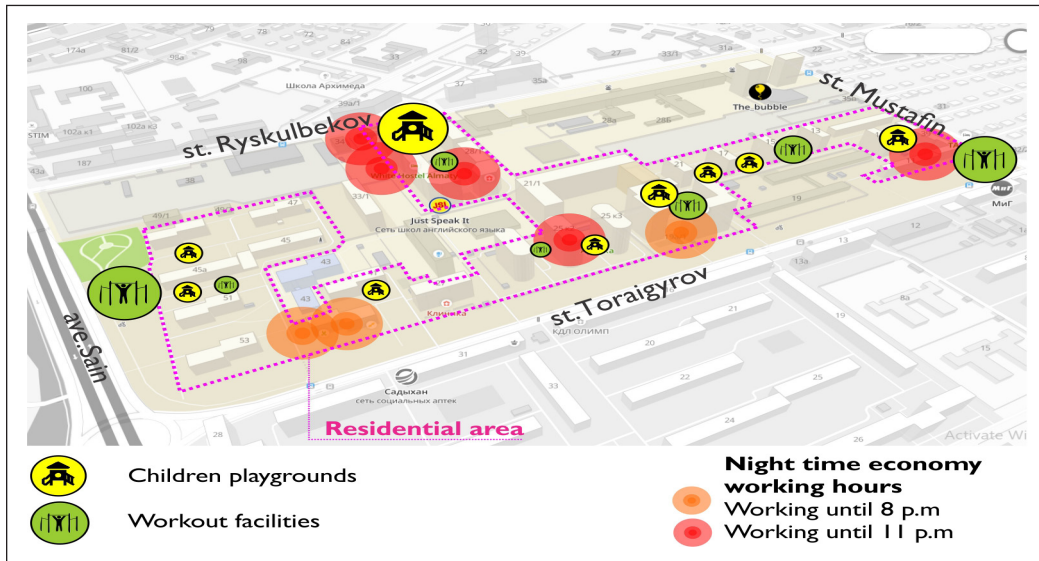
Figure 10. Analysis of playgrounds, sports facilities, and night-time ground economy (illustrated on 2GIS, 2022)

Figure 11. Lack of street life along Sain Avenue in the evening

Soviet neighbourhood, and the other 25 questionnaire results were received from Baytal residential blocks. The number of responses is the same for the convenience of comparing two local communities in the research area, as shown in Table 1.

Survey questions are designed to address the problems shown in the morphological mapping and observation. The first significant finding is that one-third of residents from the Soviet residential

blocks are not satisfied with their current living conditions. In contrast, 19 residents out of 25 in the Baytal residential blocks are contented. The survey question gives a better understanding of apartment size, location of the house, maintenance of commonly used areas, and architectural view of the area, which have a critical role for dwellers.

Secondly, residents that live in Soviet neighbourhoods use everyday facilities in their area six times on average per month and two times within their neighbourhood. However, residents from Baytal frequently use everyday facilities in their neighbourhood, although the use of facilities beyond their housing is low. These results complement the analysis of the diverse functional mix in Baytal residential blocks. Satisfaction with public realm facilities such as landscaping, playgrounds, and sports equipment was the same throughout the site; half of the respondents reacted positively. In both parts of the study areas, residents are only partially satisfied with the greenery, which is vital in improving social cohesion, as demonstrated in Table 2.

Table 1
Profile of respondents

Demographic profiles	Total	Percentage
Surveyed number of residents	50	100%
Gender		
Male	18	36%
Female	32	64%
Age range (years)		
18–25	6	12%
26–45	18	36%
45–65	19	38%
>66	7	14%
Respondents' location		
Soviet residential blocks	25	50%
Baytal residential blocks	25	50%

Table 2
Results of the survey

Research questions	Location on the selected site	
Respondents' location	Residents from the Soviet residential blocks	Residents from Baytal residential blocks
Satisfaction with living conditions (apartment size, location, maintenance of commonly used rooms in the housing and architectural and esthetical view of housing)	32%	76%
The average frequency of using everyday facilities in the residents' living blocks/residential development per month	Six times	17 times
The average frequency of using everyday facilities in the neighbourhood communities within the selected study site per month	Two times	Three times

Table 2 *(continue)*

Research questions	Location on the selected site	
Respondents' location	Residents from the Soviet residential blocks	Residents from Baytal residential blocks
Satisfaction with public realm facilities (such as landscaping, playgrounds, and sports equipment)	44%	56%
Satisfaction with public realm greenery	40%	16%
Frequency of acquainting with neighbours within a residential development / common courtyard blocks	Medium	Low
The number of friends/acquaintances there:		
0	60	80
1–10	32	16
>10	8	4
Frequency of acquainting with strangers or people from the neighbourhoods within the selected study site.	Low	Low
The number of friends/acquaintances there:		
0	92	96
1–10	8	4
>10	0	0
A feeling of open community	56%	20%
Residents who had difficulties with accessibility and permeability in a public realm within the selected study site	80%	64%
A feeling of safety at night-time (walking along within the selected study site)	60%	72%

Thirdly, the frequency of acquainting with strangers or people indicates the social cohesion within and between local communities. Interaction within the study communities in the Soviet blocks and Baytal are low, where one-fourth of residents have acquaintances in their housing blocks. However, only a few respondents, primarily women aged 26 to 45, know people beyond their neighbourhood. Most local communities do not interact with each other at all. The fundamental problem of low social exchange is barriers that limit accessibility and permeability in the public realm. This issue was pointed out by up to 80% of respondents. It results from poor urban planning and closed boundary edge conditions of exclusive developments. It also reflects on the feeling of night-time safety, where more than half of respondents perceive the walking-along experience negatively. The justification of survey analysis and public realm study results illustrate that the level of social cohesion in the selected neighbourhoods is insufficient in Table 3.

DISCUSSION OF FINDINGS

The investigation of the selected site unveiled existing urban planning issues that negatively

Table 3
Relation of survey outcomes and the public realm issues

Residents from the Soviet residential blocks	Residents from Baytal residential blocks
Highlights of survey results	
Two-thirds of residents are unsatisfied with living conditions, using everyday facilities in the residents' living blocks six times and two times in the neighbourhood monthly. Over half of residents are not contented with greenery, landscaping, playgrounds, and outdoor sports facilities. Only two-fifths of respondents know neighbours in their block and two beyond within the selected site. Approximately half of the local dwellers do not feel an open community and safety at night-time.	A significant number of Baytal inhabitants are content with their living conditions. The frequency of using local daily use facilities is much higher than in Soviet blocks. Although more than half of the residents considered public realm outdoor facilities satisfactory, most complained about vegetation. One of the considerable issues is that a fifth of respondents know other dwellers within Baytal blocks, and few people communicate with other local communities. As a result, there is a low proportion of open community feeling, despite three-quarters of respondents feeling comfortable walking along tonight.
Main issues of the public realm	
Lack of accessibility	Lack of connectivity
Poor connectivity	Shortage of greenery
Shortage of everyday use facilities	Poor connectivity
Maintenance of public realm greenery and outdoor facilities	Maintenance of public realm outdoor facilities
Level of community cohesiveness	
The medium within living blocks	Low within living blocks
Low in-between neighbourhoods	Almost no relation between neighbourhoods

impact the principles of a socially cohesive community mentioned in the theoretical framework. The research findings revealed that one urban planning problem intensifies others with a domino effect: Minor spatial urban obstacles, poorly resolved urban planning solutions, lack of community involvement and closed systems created isolated communities with failing social cohesion. For example, poor accessibility and permeability between post-Soviet residential developments and Soviet neighbourhoods, lack of functional mix and night-time economy have caused problems, such as a lack of social activity within the selected site and a lack of pedestrians at late time. While the site is not convenient for daily use, the public realm does not facilitate social interaction. Moreover, similar urban patterns in Almaty are becoming problematic in terms of social cohesion in future on a larger scale that fails the principles of a socially cohesive public realm.

Although the area intensifies with market-oriented development projects, the site still has some appealing brownfields for market-led developers' potential exclusive projects. Thus, perspective urban transformations should be open to local citizens' opinions before implementing any material intervention. Although the process of urban design could be heavy to handle by responsible parties due to tensions, debates and conflicts of interest, the outcomes will be more democratic. Despite the adverse results of traditional urban planning approaches,

the investigated urban pattern still has an opportunity to become truly cohesive.

CONCLUSION

The research of the selected site concerning the cohesive community notion has revealed three primary underpinning outcomes that could be used for perspective urban investigations and urban design strategies. Firstly, the evidence from this study suggests that the selected urban pattern in Almaty city is fragmented into different social communities. Core urban planning omissions cause the lack of cohesiveness between neighbourhoods. Secondly, the critical issues of poor social cohesion are gated post-Soviet neighbourhoods that emerge due to closed-edge conditions, poor connectivity and accessibility within the selected site, and lack of everyday use facilities and the night-time ground economy. Thirdly, the current public realm has little value in benefiting local communities of Soviet neighbourhoods. Finally, the methodological approach used in the paper with a combination of morphological mapping, observation and survey could be applied to other similar urban contexts of post-Soviet towns to explore urban patterns through the lens of a socially cohesive public realm.

IMPLICATION OF THE STUDY

The research revealed the existing public realm issues in creating cohesive communities in the case of a typical urban pattern in Almaty. These findings provide insights for potential urban transformations, such as creating accessible public realms to outsiders but allowing residents to have a local sense of community to foster a spirit of open community identity. Therefore, there are next steps for further implication. First, the results of the survey and analyses should be introduced to local communities via social media and neighbours' chats. Secondly, active local volunteers form action groups. Urban design practitioners and students, including the authors of the research, support them regarding design strategies. They should consider ways to improve social cohesion, allowing better accessibility, connectivity and walkability for potential social interactions and possible ties between and within communities. Thirdly, the concept of a socially cohesive public realm could be proposed to local authorities to implement through city development plans. One of the more significant principles to emerge from this study is that the public realm should be designed as a process open for further modification by citizens because cities are in flux.

ACKNOWLEDGEMENTS

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Impact of Physical Environmental Factors on Mental Wellbeing of Condominium Dwellers

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ABSTRACT

This paper attempts to reveal the outcomes of the empirical research investigating how the physical environments of the residential high-rises, known as condominiums, including the urban and community contexts, impact mental wellbeing of the dwellers since the emergence of condominiums in Bangkok's real estate market has continued to proliferate. The principal objectives of the research are to determine the assumption that the high-density urban environment and unique structure of condominiums are the significant determinants affecting occupants' mental status. Based on the quantitative research approach, the two-stage stratified sampling technique and a cross-sectional survey were performed to engage 1,206 participants from eighteen high-rise condominiums in Bangkok. The interdisciplinary research instruments applied in this study are a Physical-Environmental (PE) Assessment for evaluating the physical environment and surroundings of the condominiums and a Personal and Psychological (PP) Questionnaire for collecting respondents' attributes and their psychological status quo: safety concerns, privacy satisfaction, and a sense of community at the time of their dwelling in condominiums. At the analytical stage, three inferential statistics, Pearson product-moment correlations, independent sample t-test, and one-way analysis of variance, were applied at the p-value ≤ 0.05. The results endorsed three urban factors: geographical zoning, land use zoning, and density of population as significant dominants of safety concerns, including the sense of community of condominiums' dwellers, whereas community and architectural factors appeared to have distinctive effects on all three psychological variables.

Keywords: Condominium, environmental-cognitive psychology, high-rise housing, mental wellbeing, urban and housing development, urban psychology

INTRODUCTION

The rapid growth and primate characteristic of Bangkok, Thailand's capital city, has urged demand for vertical living for decades. As the nation's business hub, Bangkok attracts expatriates and migrants worldwide. This metropolis now houses over ten million population and provides all amenities for its civilians, much more advanced than any other region of the country. The value of land in Bangkok has been steadily rising till it has become a dilemma for low/middle-income people to own property. The traditional low-rise houses in the central business districts (CBDs) are being transformed into high-rise residential buildings known as "condominiums" or "condos" (Rujibhong, 2017).

Since the Condominium Act was enacted in 1979, private-owned residential high-rises have played an essential role in Bangkok's property market. These condominiums have emerged as the preferred choice of accommodation amongst young professionals, owing to their embodiment of a trendy urban lifestyle and the provision of essential living services (Poonsawat et al., 2022). Despite dwelling on the top floor of a luxury condo, living in one of the most densely populated cities (approximately 3,797/km²) like Bangkok has never been easy (Digital Government Development Agency, 2021). In exchange for better economic opportunities, Bangkokians succumb to the competitive way of life, traffic congestion, chaotic rush hour, expensive cost of living, pollution, and crimes. These difficulties cause stress, exhaustion, and individuality due to discouragement of social interaction and loitering around neighbourhoods. In the interest of saving commuting time and promoting a symbiotic bond between population density, compact urban form, and public transportation usage, transit-oriented development (TOD) has persistently continued Bangkok's condominium development trajectory. As a consequence, a significant number of condominiums have emerged in prime locations strategically situated along the two public transportation systems: the "Bangkok Mass Transit System (BTS)" and the newly developed "Metropolitan Rapid Transit (MRT)" (Klinchuanchun, 2022; Thansettakij, 2023) (Figure 1).

As mentioned earlier, Figure 1 illustrates Bangkok's centralised development pattern dominated by intrinsic factors: population density, public transportation development courses, and land overprice. Another dominant fabricating of the monocentric condominium development is urban planning regulations. The two bulk-control indicators, Floor Area Ratio (FAR) and Open Space Ratio (OPR) allow taller condominiums to be built in Bangkok's central area—commercial zone and medium to high-density residential zones—more than others.

Living in residential high-rises in metropolitan areas can be two sides of the same coin. On the one hand, it offers occupants on the high floor a splendid city view, increased privacy, and less traffic noise pollution, yet certain limits of its physical environment tag along on the other hand (Gifford, 2007; Rujibhong, 2019).
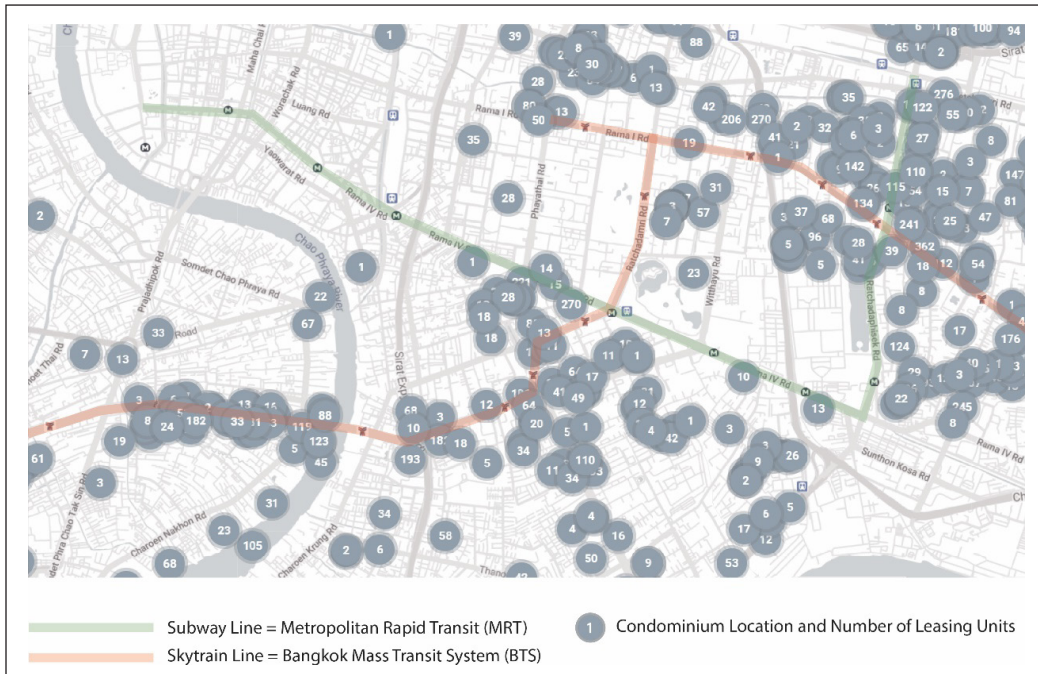
Figure 1. The map illustrating the densification of condominiums oriented by MRT and BTS lines in Bangkok's CBD

Besides urban's chaotic surroundings, residential high-rises' unique structure could be advantages and disadvantages for human wellbeing. As commonly known, the core of a multistorey building (e.g., central core, split core, and atrium core) is an essential architectural element of load-bearing. It integrates functions and service needs, for instance, elevator banks, mechanical facilities, plumbing, smoke shafts and fire-fighting stairs for the occupants (Ibrahim, 2007; Rujibhong, 2019; Szolomicki & Golasz-Szolomicka, 2019). Such vertical structures considerably cause difficulties in emergency evacuation and often exacerbate smoke and flame spreading all over the building during fire incidents. Since the Great Fire of Rome in AD 64, when the Insula apartment was first built, until the Grenfell Tower fire incident in 2017, fire emergency has been the most concerning issue amongst high-rise residents.

It seems paradoxical that these residential buildings provide high privacy for their residents by separating each living unit with shared "walls, ceilings, and floors with neighbours adjacent above and below" (Kennedy et al., 2015; Rujibhong, 2017). Despite the tightened proximity, such visual blockage successfully forms the perception of privacy amongst occupants and completely tears them apart. Without defensible territory and semi-public areas (i.e., a single house's front yard), condominium inhabitants sometimes maintain their security and privacy by living anonymously and avoiding hanging around the corridor and common areas. This level

of anonymity, enhanced by the architecture of the tall building, dissuades people from their community spirit. When humans do not interact, developing a sense of community is impossible (Kloos et al., 2012; Rujibhong, 2017). As indicated in previous studies, a social withdrawal existed among apartment and multifamily residential buildings' inhabitants. Besides architectural features, another presumptive cause of a lack of a sense of community is the density of the population. The argument around this issue is that density oppositely relates to the sense of belonging and supportive behaviour toward neighbours (Ng, 2009).

The ramifications of living in high-rise housing in urban contexts, particularly in Bangkok, have not been extensively studied in terms of their impact on the mental wellbeing of residents. While condominiums are popular in Bangkok, their ability to meet psychological needs has been debated. Limited quantitative research exists on the influence of physical conditions in Bangkok's condominiums on occupants' mental wellbeing. This article addresses this research gap by providing statistical evidence to comprehensively understand the correlation between condominium physical conditions and residents' mental wellbeing (Rujibhong et al., 2016).

Concerning the issues of urban Bangkok and the physical environments mentioned above, the pursuits of this article are (1) to elaborate on how the physical environment of condominiums and urban communities impacts the mental wellbeing of the dwellers and (2) to highlight the statistical significant factors by their effect size and statistical power as well as to answer the following research questions (RQ):

RQ1: Which physical environmental factors related to condominiums significantly influence the mental wellbeing of inhabitants?

RQ2: To what extent do individual physical environmental factors influence the mental wellbeing of inhabitants differently?

LITERATURE REVIEW

In order to quantitatively obtain answers to the research questions mentioned above, it is necessary to comprehend and identify essential bodies of knowledge that will facilitate the extraction of measurable factors and variables. The following knowledge sets encompass the physical environmental factors associated with condominiums, as well as the quantifiable aspects of the mental wellbeing experienced by condominium inhabitants.

The Physical Environmental Factors Related to Condominiums

Within the scope of this research, the term "physical environmental factors" pertains to the tangible components and constructed surroundings of the condominium building and its immediate vicinity. Although condominiums possess unique architectural characteristics, it is essential to consider them as a new type of housing and compare them with the global housing concept. Thus, it becomes crucial to rely on characterising condominiums as a type of house.

Referring to the United Nations' right to adequate housing, it is established that "adequate housing" must satisfy seven criteria: security of tenure, availability of services, affordability, habitability, accessibility, location, and cultural adequacy. This definition expands the scope of this research to encompass an examination of the urban context of the district and community in which each condominium is situated (United Nations, 2022).

In the field of urban sociology, dating back to 1905, the influential work of Georg Simmel, a sociologist and philosopher, explored the profound impact of the urban context on individuals. Simmel argued that the unique urban environment acts as an external factor that gradually shapes the internal adaptations of its residents. More specifically, urban living exposes people to increased and prolonged stimulation, affecting them deeply. At the same time, the prevalence of intellectualism, which emphasises traits like punctuality, calculability, and strict social norms, separates individuals from their inherent human nature. The rapid and constant influx of stimuli within urban surroundings could make individuals indifferent or unimpressed, regarding perceived differences amongst things as meaningless (Simmel, 1950; Takooshian, 2005).

However, Park and Burgess (1972) provided alternative perspectives on the social dynamics and psychological effects of urban living. Park argued for a more nuanced understanding of urban life, emphasising the potential for social cooperation, cultural diversity, and community formation in cities (Park & Burgess, 1972). Wirth, on the other hand, examined the effects of urbanisation on the individual, stressing the role of anonymity and the formation of subcultures within urban settings. He highlighted three urban characteristics: "(1) large numbers of people, (2) high population density, and (3) heterogeneity of population, as the city life's socio-psychological determinants" (Wirth, 1938). Later, in 1970, the sociologist Stanley Milgram confirmed these factors by publishing the statistical findings of his experimental research. He agreed with Wirth that the population density could constitute "a continuous set of encounters with overload and resultant adaptations" (Bibi, 2022, p. 12). He also criticised that the city dwellers, so-called "urbanites," limited themselves from altruistic behaviour. The lack of willingness to trust and assist strangers among urbanites was related to their perceived physical and emotional vulnerability stimulated by urban crime statistics. The heterogeneity of the city that produced a greater tolerance for behaviour and codes of ethics encouraging people to withhold aid for fear of antagonising strangers or crossing an inappropriate and difficult-to-define line was another reason (Barrett & Horne, 2022; Milgram, 1970).

Later, a group of built environment researchers underscored the significance of social and physical environments in shaping individuals' perceptions and experiences of inclusive wellbeing. The authors highlighted the pivotal role of density and deprivation as crucial parameters that provided valuable

insights and evidence into the fundamental connection between the urban environment and its impacts on health and wellbeing. By examining the interplay between these factors, their work sheds light on the complex relationship between the urban environment and its influence on individuals' overall wellbeing (Rajendran et al., 2009).

Meanwhile, Thailand's Department of Public Works and Town and Country Planning is vital in defining district characteristics and implementing land use zoning regulations. These regulations, guided by the Town Planning Act, cover open space, transportation, public infrastructure plans, and policies controlling the height of residential buildings, including condominiums. This framework establishes property rights and ensures that the surroundings of each condominium align with the designated land use zoning (Panjaburee & Boonvas, 2016). For example, condominiums in the red zone, representing commercial areas, are typically surrounded by commercial buildings, chaotic activities, and a higher population density than condominiums in the yellow zone, which denotes low-density residential areas (Figure 4.).

When transitioning from the urban context to condominium arcades, the management of the territory and access control within vertical communities has been a topic of debate through the last decades. It has been argued that the proliferation of gated community developments reflects shifts in societal values influenced by globalisation (Low, 2001). The term "gated community"

has been defined in various studies as a residential area with walls or fences that restrict public access. These communities are characterised by legal agreements that establish a set of rules and responsibilities for residents regarding the management of the community. The advantages of gated communities, as described in some studies, include implementing a managerial approach by real estate developers to clearly define property boundaries and provide safety and security for residents. Additionally, gated communities foster a sense of community amongst residents. However, some scholars view gated communities as visual representations of fear created through the presence of gates, solid walls, and security personnel (Atkinson & Blandy, 2005; Barrantes, 2021; Li, 2013; Rujibhong, 2017). Furthermore, evidence reveals that among high-income residents, people living in the gated compounds had a weaker sense of community than the non-gated ones but were indifferent to the low-income group (Wilson-Doenges, 2000).

One of the most widely recognised and influential concepts in architectural design for multifamily residential complexes is "Defensible Space," developed by Oscar Newman, an American architect and city planner. Defensible Space focuses on the relationship between architectural features and residents' perceived safety and security. This concept is composed of four key components: (1) territoriality: This component emphasises the creation of clearly defined spaces that establish a sense of ownership and control within the

residential complex; (2) surveillance: The Surveillance component aims to design the environment in a way that promotes natural surveillance, allowing residents to observe and monitor their surroundings during regular daily activities, (3) image: The Image component focuses on designing the physical environment to convey a sense of security and safety, both visually and psychologically, to the residents, (4) milieu and juxtaposition: This component considers the influence of the surrounding context and adjacent elements on the safety and security of the residential complex and its inhabitants.

By incorporating these four components into the architectural design, the defensible space concept seeks to create multifamily residential complexes that enhance residents' perceived safety, security, and overall wellbeing (Newman, 1972). The concept of defensible space views outsiders as potential offenders, whereas Jacobs (1961) and Hillier (1999) perceived strangers as potential guardians. Jacobs advocated against segregating spaces into single-purpose areas and instead promoted diverse land usage, including residential, commercial, entertainment, and institutional functions, to attract a constant flow of people throughout the day (Hillier, 1999). Hillier further argued that street accessibility enhances natural surveillance as the presence of strangers serves as a "natural police mechanism" (Reynald & Elffers, 2009).

Previous studies have also addressed the arguments concerning the socio-psychological impacts of the unique physical environment within condominiums. Condominiums are widely recognised for their distinctive architectural features, including an internal core serving as shared access to each floor, along with shared walls and floors that separate individual living units. These physical attributes have been described as creating a "sealed cell" environment, which can contribute to a reduced sense of neighbour recognition and community compared to other housing types. Furthermore, researchers have identified specific fears experienced by residents of high-rise buildings, such as concerns related to strangers and criminal activities, apprehension regarding elevator malfunctions, and the fear of falling from higher floors (Abramova et al., 2021; Gifford, 2007; Gifford et al., 2011; Jephcott & Robinson, 1971; Li, 2013).

The Mental Wellbeing Factors Related to Condominium Dwellers

The notion of "home" extends beyond mere ownership of physical assets. It entails a dynamic interweaving of living experiences, age, and generational aspects that contribute to a sense of safety, security, and identity (Dupuis & Thorns, 1998). Within the realm of understanding the concept of home, various interpretations exist. However, for this study, the psychological perspective holds particular relevance, as it is intricately linked to mental wellbeing.

Fundamentally, a house serves as a source of physical security and wellbeing for its occupants. Beyond its primary function, the physical attributes of a house play a

crucial role in fulfilling the psychological need for privacy and enabling control over environmental comfort. Additionally, the more complex human needs, such as social recognition and empowerment, can be addressed through the transition from the interior to the outer realms of an individual's home, expanding the sphere of influence and engagement (Després, 1991; Dupuis & Thorns, 1998; Maslow, 1958).

Empirical research studies on developing a sense of home and attachment to living spaces refer to the concept of psychological home. Psychological home is a dynamic process where individuals modify and maintain their environment to reflect their sense of self. It is driven by the need to establish a personal connection between oneself and a physical location (Sigmon et al., 2002). The psychological home encompasses cognitive, affective, and behavioural components, involving attributions about people, emotions associated with establishing a home, and actions to make a place feel homelike. Creating a psychological home provides a refuge that offers security, safety, and protection from external stresses, reducing anxiety and aiding in coping with change.

By applying the principles of psychological home, Cicognani et al. (2014) identified through regression analysis that the perceived quality of the relationship with the house, which represents the privacy and unique expression of individuals' selves, and the sense of belonging to the territorial community significantly influenced the life satisfaction of elderly individuals

(Cicognani et al., 2014). Meanwhile, another quantitative study also found that psychological home predicted life satisfaction even after accounting for contextual variables, for example, age, type of dwelling, number of people in the household, and years in residence (Bužgová et al., 2023). Factors such as dwelling type, social interaction, and length of time in a home contributed to higher subjective wellbeing levels, as revealed through regression analysis (Crum & Ferrari, 2019).

The results of the previous research have yielded compelling evidence highlighting the interplay between feelings of safety, privacy, and a sense of community within the overarching framework of the psychological home. However, a discernible research gap persists regarding each constituent pillar's independent and interdependent functioning. Therefore, this study aims to address this gap by focusing on the discrete examination of each significant psycho-factor as the fundamental unit of measurement. In the meantime, the study seeks to unravel the nuanced impact of the condominium environment on each psycho-factor, thus contributing to the advancement of scholarly understanding in this domain.

Safety Concerns Associated with Condominiums

The feeling of safety is the most psycho-fundamental for humans, yet the dimensions of safety are complicated. Feeling safe involves (1) psychological safety and (2) actual safety. At a particular time, a person might feel safe and secure, though they are

not in reality. More than that, the degree of "safety needs" and "reaction to threats" of an individual relies on each person's cognitive bias and heuristics (DeMartino & Stacey, 1958; Schneier, 2010). Environmental psychology researchers often have to deal with perceived psychological safety and security, not the actual ones.

Following the 9/11 attacks, a reporting initiative, Connecting Research in Security to Practice (CRISP), identified three broad categories of threats associated with living in high-rise housing. These categories include (1) crime, encompassing offences such as homicide, robbery, unauthorised access, and property damage; (2) behavioural disorder, involving issues like drug abuse, domestic violence, and suicide risks; and (3) emergency, covering natural or human-caused emergencies such as fires, terrorist attacks, elevator malfunctions, and electricity blackouts (Challinger, 2008).

Several concerns have been raised regarding the safety of residents in high-rise buildings, particularly related to the height of such structures. Research conducted in Hong Kong and Singapore highlighted that a small percentage of individuals living in tall buildings expressed unease about building height, leading to their reluctance to occupy higher floors (Yuen et al., 2006). Stefanucci and Proffitt, who explored the perception of vertical distances, discovered that people tend to overestimate distances when looking downward from elevated positions, particularly compared to upward from ground level (Stefanucci & Proffitt, 2009). Moreover, this overestimation

correlated with individuals' self-reported fear of heights (Abramova et al., 2021; Ng, 2017).

This study also utilised these conceptual frameworks of the threats of tall buildings, including the potential condominium features, for example, the height of condominiums, and applied them to assess and measure the safety concerns related to these contemporary threats in subsequent investigations. In subsequent investigations, this study also applied these conceptual frameworks to evaluate and measure the safety concerns associated with these modern threats.

Privacy Satisfaction Associated with Condominiums

Perceived privacy is somehow related to a person's vulnerability to hazards. The World Health Organization (2011) once stated that suitable housing should ensure personal and household privacy and allow occupants to live without fear of intrusion with safe entry and exit (World Health Organization, 2011). The absence of privacy can make a person insecure, leading to asocial behaviours, for example, fear of crime, causing social withdrawal and lowering the value of properties (De Macedo et al., 2022; Newell, 1994).

Since the 1970s, psychologists have considered privacy as a process of boundary control that a person allocates with his/her in-contact(s). This psychological regulation controls the situation, players, and the degree of interaction. Theoretically, the control of boundaries associates "both restricting and

seeking interaction to achieve the desired degree of access to the self or one's group by others, at a particular time and a given set of circumstances," which could fail or achieve their preferences. Later, in 2005, a psychologist, Margulis (2003), summarised that privacy represents control over the transaction between a person and others. The ultimate goal is to enhance autonomy and (or) minimise vulnerability (Margulis, 2005; Pedersen, 1979; Pedersen, 1999).

In a mixed-method study conducted by a group of researchers on residents living in multi-story apartments in the tropical climate of Brisbane, key findings revealed that residents value flexibility and choice when managing privacy and comfort throughout the day. The discussion also highlighted the significant design interrelationships among various comfort and privacy factors in the design of liveable apartment spaces (Kennedy et al., 2015).

This study further developed the indicator for measuring occupants' privacy satisfaction related to everyday life in condominiums based on the most salient four aspects of privacy proposed by Burgoon et al. (1989): psychological, informational, physical, and social/interactional privacy. It is also an essential state of mind, accelerating humans' contemplation and self-discovery (Burgoon et al., 1989).

Sense of Community Associated with Condominiums

A person can expand an abstract boundary of home beyond the dwelling unit to the larger scale of community, city, or country

via social recognition, modification, and selection. Besides the satisfaction of privacy, social empowerment is also the key to reinforcing the sense of belonging to a home environment. As highlighted in previous studies, community participation is essential to social beings like humans, particularly for urban people who live in a heterogeneous society. Social participation can lessen alienated feelings and help people to become identified. The vital psychological process motivating people's enthusiasm to have such participate is the sense of community (Appleyard, 1979; Rujibhong, 2017; Wang & Li, 2023).

Proposed by McMillan and Chavis in 1986, the "Sense of Community Index (SCI-1)" comprised 12 questions categorised by four principles of the sense of community: (1) membership, (2) reciprocal influence, (3) reinforcement (integration and fulfilment of needs), and (4) shared emotional connection (Bess et al., 2002; McMillan & Chavis, 1986). Later, in 2008, Chavis et al. further developed the SCI-2, which comprised 24 questions yet relied on the same four principles. The SCI-2 has become the most applicable and validated index measuring the sense of community since its broad scope can be associated with presumptive relationships across different types of demographics (Chavis, Lee, & Acosta, 2008; Chipuer & Pretty, 1999; Richard et al., 2023).

In a quantitative study on the communal attributes of condominiums and their influence on social interactions amongst apartment dwellers in Colombo, Bandara

et al. (2020) discovered a significant correlation between the usage of communal facilities such as swimming pools and gym areas and the occurrence of social interactions. The research findings indicated a high utilisation of these spaces in all three condominiums, and a parallel increase in social interactions was observed. This finding supports the idea that when the utilisation of communal spaces is maximised, there is a corresponding increase in the potential for social interactions. Based on the architectural context of three condominiums in Colombo, the researchers defined the communal attributes as the different recreation facilities: function room, kids' area, gym and swimming pool, and landscape area (Bandara et al., 2020).

This study adopts the concept of grouping architectural features into communal characteristics within the condominium. Also, it integrates the use of the SCI-2 to measure the sense of community amongst condominium residents. The study also elaborates on the modified survey assessing the residents' sense of community about the communal characteristics of the building, which are expected to support the mental wellbeing of the residents.

MATERIALS AND METHODS

Based on a thorough review of pertinent literature and the previously stated research inquiries, the research hypothesis (H_1) can be articulated as follows:

"Urban (IV1), community (IV2), and architectural (IV3) factors exert significant influence on safety concern (DV1), privacy satisfaction (DV2), and sense of community (DV3)."

The construct diagram in Figure 2 proposes two sets of variables emphasised in this study and the presumptive effect that each physical environmental factor (IV1/IV2/IV3) influences each psychological status of this sample group (DV1, DV2, DV3) distinctively and significantly. It further leads to the research instruments and methods.

Independent Variables Set (IV) consists of:

IV1 Urban Factors are variables involving urban characteristics: (1) *district population density* (ratio scale: person/m^2), (2) *land-use zoning* (nominal scale: medium/high-density residential zone, commercial zone), and (3) *geographical zoning* (nominal scale: Northern/Central/Southern/Eastern/Northwestern/Southwestern Bangkok).
IV2 Community Factors are variables involving community characteristics: (1) *community types* (nominal scale: gated/non-gated community) and (2) *socioeconomic status of the community* (nominal scale: low-medium-high price in THB/m^2)
IV3 Architectural Factors are variables involving characteristics of the residential buildings: (1) *building types* (nominal scale: atrium/single/doubled-loaded corridor), (2) *defensible setting* (interval scale: ranking score 1 to 5, evaluating access control,
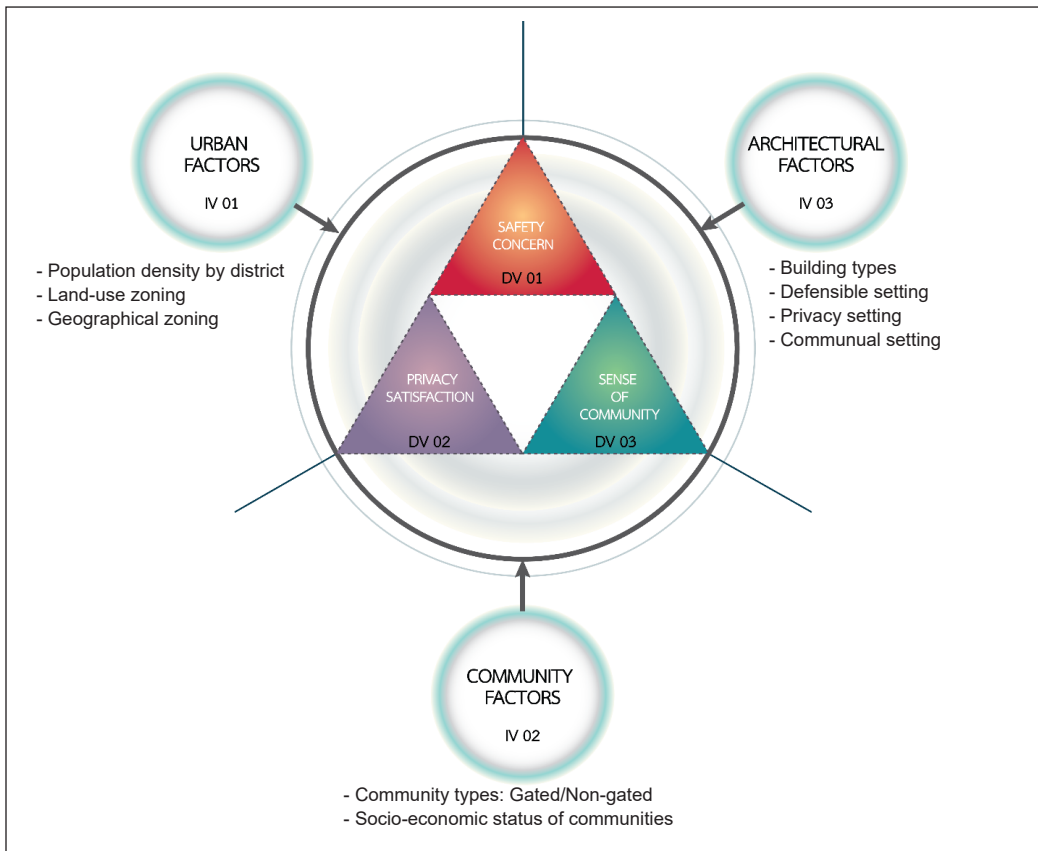
Figure 2. Research variables and constructs

surveillance, territoriality, and milieu and juxtaposition of condominiums), (3) *privacy setting* (interval scale: ranking score 1 to 5, evaluating number of units per floor, type of typical floor plan, and number of unit's members), and (4) *communal setting* (interval scale: ranking score 1 to 5, evaluating a variety of common and recreational areas and visual exposure/ease of accessibility).

Dependent Variables (DV) Set consists of:

DV1 Safety Concern is a self-reported psychological measure reflecting the degree of anxiety regarding potential harm from three types of threats in condominiums: (1) *degree of concern about crime*, (2) *degree of concern about behavioural disorder*, and (3) *degree of concern about emergencies* (all categories measured in Likert Scale 1 to 5).

DV2 Privacy Satisfaction is a variable that signifies the extent to which residents feel satisfied with their ability to control and manage their privacy in various situations within condominiums. It contains four dimensions of privacy: (1) *level of psychological privacy*

satisfaction, (2) *level of informational privacy satisfaction*, (3) *level of physical privacy satisfaction*, and (4) *level of social/interactional privacy satisfaction* (all categories measured in Likert Scale 1 to 5).

DV3 Sense of Community measures the strength of the bond between residents and their condominium community. It encompasses four aspects: (1) *feeling of membership*, (2) *feeling of reciprocal influence*, (3) *feeling of reinforcement* (integration and fulfilment of needs), and (4) *feeling of shared emotional connection* (all categories measured in Likert Scale 1 to 5).

Research Methodology

As stated earlier, this study aimed to determine and statistically confirm the significant effects of physical environmental factors on the mental wellbeing of condominium dwellers. The cross-sectional survey was planned to collect data to test the above hypotheses.

Research Population and Setting

The population of this study addressed more than 350,000 dwellers of condominiums located in the Bangkok Metropolitan area. The sample size was estimated using Taro Yamane's sample size table for a number of the population more than 100,000. The desired sample size was between 1,111 and 1,222 participants (with a ±3.0 % margin of error, a 95% confidence interval plus 10% compensation for non-response). Upon concluding the survey, it was determined

that the sample size amounted to 1,206 participants. Table 1 provides a breakdown of the number of respondents from each condominium.

The Bangkok Metropolitan area was clustered into six different zones according to the criteria of the City Planning Department (CPD) to ensure that the samples represented the entire population throughout the city. Of each zone, three condominiums were purposively defined to represent the low-selling price condominiums, middle-selling price condominiums, and the high-selling price condominiums consecutively. The total number of selected residential high-rises then became eighteen.

Research Instruments

Since the goals are to evaluate the physical existence of eighteen condominiums and to collect the residents' data, two research instruments were initiated and designed to fit several units of measurement and the manners of both categorical and numerical data, as described below.

Physical-Environmental (PE) Assessment. The PE assessment evaluated the physical environment of the selective condominiums, including their surroundings, as framed in the scope of the study. The tool implementation was during the non-participant observation by the researcher. In fulfilling the PE assessment criterion, some indicators need answers from the secondary data, for example, the population density of each district and the typical floor plan of the condominiums.

Personal and Psychological (PP) Questionnaire. The PP questionnaire was to collect personal information from the samples. The questionnaire allowed respondents to self-report their personal background information and the status of three psychological variables: (1) safety concern, (2) privacy satisfaction, and (3) sense of community while residing in condominiums in the Likert Scale 1 to 5.

Sampling Technique

This research applied the two-stage stratified sampling technique to recruit respondents living in Bangkok's condominiums (Figure 3).

Stratum 1: Stratified by Geographical Regions. Ensuring the samples represent the population -condominium dwellers of 350,000 units located in Bangkok- this study divided the city into six geographical zones regarding the City Planning Department (CPD). The breakdown of engaged respondents from each zone is as follows: (1) Northern Bangkok (215 respondents), (2) Central Bangkok (200 respondents), (3) Southern Bangkok (195 respondents), (4) Eastern Bangkok (178 respondents), (5) Northwestern Bangkok (Northern Thonburi) (207 respondents), and (6) Southwestern Bangkok (Southern Thonburi) (211 respondents).

Stage 1: Economic Classifications and Inclusive Criteria. Purposively, the participating condominiums of each zone represented the three different selling price levels, according to the condominium price

index defined by the Real Estate Information Center (REIC), as follows.

1. Low-selling price: less than 50,000 Baht/m^2
2. Middle-selling price: 50,000 - 79,999 Baht/m^2
3. High-selling price: greater than or equal to 80,000 Baht/m^2

By the legal definition of high-rise condominiums applied in this research, the participating condominiums must (1) be residential high-rise buildings higher than 23 m, (2) be operated and occupied for more than five years, and (3) formally grant authorisation to the research team to administer the survey on their property.

Stage 2: Simple Random Sampling. In the final stage, the random lottery technique was applied. The survey involved 1,206 respondents living in eighteen condominiums who willingly consented to answer the PP questionnaire (Figure 3).

RESULTS

Prior to the full-scale field survey, the Index of Item Objective Congruence (IOC) was performed to confirm the content validity of the research tools: (1) Physical-Environmental (PE) assessment and (2) Personal and Psychological (PP) questionnaire. Regarding the IOC evaluators' recommendations, the PP questionnaire was improved and trialled in a pilot study. Both tools, the PP questionnaire and the PE assessment, were randomly administered at the condominium coded SB03. The result derived from the SB03 condominium
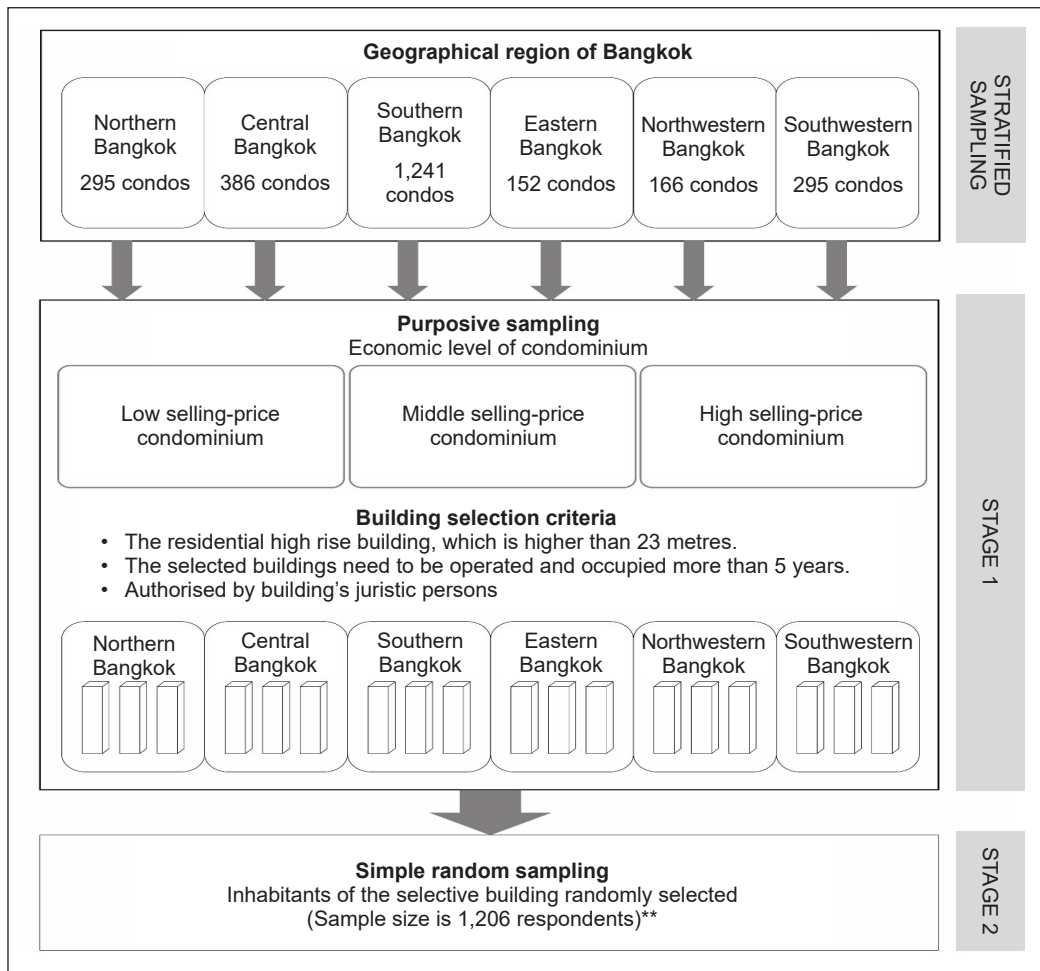
Figure 3. Two-stage stratified sampling technique applied in research

(n = 65) was examined for the survey's validation, reliability, and uni-dimensional qualification. The calculated Cronbach's Alpha coefficient value confirmed a high internal consistency of the overall PP questionnaire at 0.905.

Demographic Data

The survey results indicated that the proportion of females (683 respondents = 56.6%) was higher than males (523 respondents = 43.4 %). The age of the sampling group average was 32.8 years old. Most samples were in middle adulthood (35–60 years old) and early adulthood (25–34 years old) (32.0%), respectively. Regardless of outliers, the samples were in the middle-level income. The mean, mode, and median household income (per month) were 56,949 THB (appx. 2,186 Euro), 50,000 THB, and 50,000 THB (appx. 1,280 Euro) per month consecutively. Meanwhile, 555 respondents (46%) owned the dwelling units (Rujibhong, 2017).

Results of Physical Environmental Assessment (PE)

About the assessment, participated buildings were systemised in code: the first three letters represent the geographical zone (Figure 4), and the last two digits represent the economic level of the condominium (Table 1).

The figure below illustrates the locations of condominiums engaged in the survey. As mentioned earlier, the Floor Area Ratio (FAR) and Open Space Ratio (OPR) have influenced a conglomeration of high-rise condominiums to be built in commercial zones and medium to high-density residential zones than others (Figure 4).

The data about the urban attributes of each condominium was elaborated in the following columns: geographical zoning, zoning code, land use code, and population density by district (Table 1). The community factors of each condominium were recorded
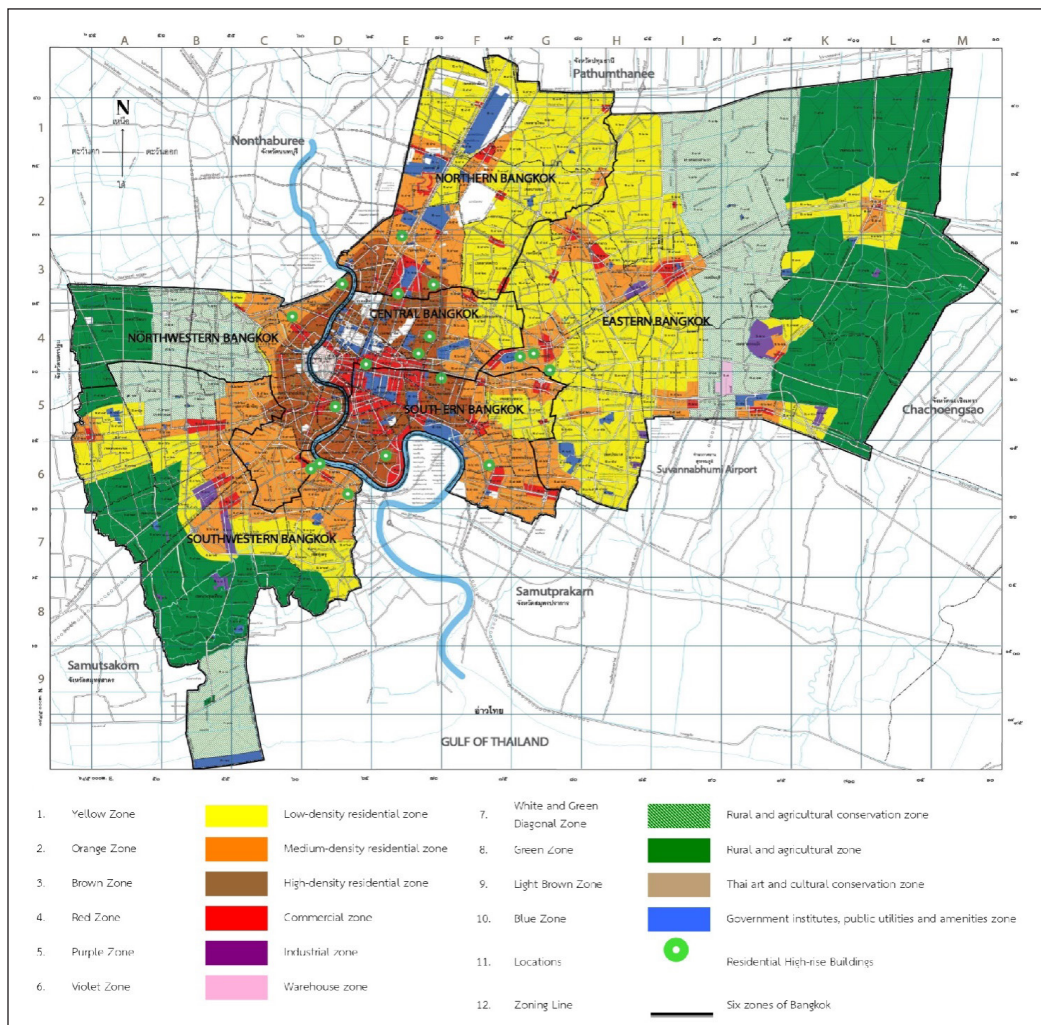
Figure 4. The map illustrating the locations of 18 condominiums and land-use zoning in Bangkok

in the columns: level of condominium, economic code, and community type. The architectural characteristics classified into three variable sets: the defensible score, privacy satisfaction score, and communal score were recorded.

Based on the data (Table 1), the condominiums CB01-03 are situated in the distinctive context of commercial zones (CMC) and high-density residential areas (HDR). These condominiums are also located in the most densely populated areas of Bangkok. In contrast, the condominiums NB01-03, situated in the northern region of Bangkok, are in the least densely populated area of Bangkok's inner city (MDR).

Regarding community factors, the data shows that most middle-priced condominiums were designed with a more open concept by adopting a semi-gated community approach.

Defensible Setting Score

The non-participant observation and PE assessment summary showed that the high-priced condominiums (NB, SB and NWB, Econ Code 03) earned the highest defensible setting score, scaling from 1 to 5. Meanwhile, the low-priced condominiums (NB, CB, and EB Econ Code 01) received the lowest scores. Comparatively, the high-priced condominiums' protective territoriality and surveillance system were superior to the low-priced ones. Besides, the low-priced condominiums had problems with multiple entrance controls and locations that were forlorn or far from public transportation (Figure 5).

Privacy Setting Score

The comparison of condominiums' economic levels showed that the average privacy setting score of all three levels was indifferent. Notably, the high-priced condominiums earned better scores on privacy features than others (Figure 6).

The PE assessment evaluated the privacy setting score by considering the type of building's core structure (atrium/ single-loaded/double-loaded corridor) and floor density (number of living units per floor) as physical features that effectively provide more privacy for occupants. Before applying the inferential statistic, the privacy setting score of each building was merged with the score of density per unit measured by the PP questionnaire.

Communal Setting Score

The graph below illustrates that the middle-priced condominiums, on average, received higher communal setting scores than others. The critical indicators considered in this category were various recreational facilities, and the layout of the master plan (sociopetal/ socio-fugal design) assumed to invigorate occupants and entail a high perception of the communal atmosphere (Figure 7).

Results of Personal Psychological Questionnaire (PE)

The Exploratory Factor Analysis (EFA) indicated that all questions (Likert Scale 1 to 5) derived from the PP questionnaire were adequately factorable (all factor loadings ≥ 0.60). Considering the safety concerns score, the three most concerning issues

Table 1
Results of physical environmental (PE) assessment

Geographical Zoning	Zoning Code	Level of Property	Econ. Code	Condo Code	Land use	n	Population by District person/km²	Community Type	Defensible Score (1 to 5)	Privacy Score (1 to 5)	Communal Score (1 to 5)
Northern Bangkok	NB	Low	01	NB01	MDR	70	4,847	Semi-gated	2.40	3.50	4.50
		Middle	02	NB02	HDR	77	4,847	Semi-gated	3.80	3.50	4.00
		High	03	NB03	HDR	68	4,847	Gated	4.60	3.50	2.00
Central Bangkok	CB	Low	01	CB01	HDR	70	15,078	Semi-gated	2.40	3.00	2.00
		Middle	02	CB02	HDR	71	15,078	Gated	3.60	3.50	4.00
		High	03	CB03	CMC	59	10,328	Gated	4.00	4.00	1.50
Southern Bangkok	SB	Low	01	SB01	HDR	62	4,814	Gated	3.20	3.50	2.00
		Middle	02	SB02	HDR	68	6,702	Semi-gated	2.80	4.00	4.50
		High	03	SB03	HDR	65	6,592	Gated	4.60	4.00	2.00
Eastern Bangkok	EB	Low	01	EB01	MDR	60	5,227	Gated	2.60	4.50	2.50
		Middle	02	EB02	MDR	70	5,227	Semi-gated	4.00	3.50	3.00
		High	03	EB03	MDR	48	5,227	Semi-gated	4.20	3.50	2.00
Northwestern Bangkok	NWB	Low	01	NWB01	MDR	71	8,405	Gated	3.80	2.50	3.00
		Middle	02	NWB02	MDR	70	8,405	Semi-gated	4.00	2.00	5.00
		High	03	NWB03	HDR	66	12,361	Semi-gated	4.40	3.50	2.00
Southwestern Bangkok	SWB	Low	01	SWB01	MDR	71	5,332	Semi-gated	3.00	3.00	1.50
		Middle	02	SWB02	MDR	69	5,332	Gated	4.20	3.50	3.00
		High	03	SWB03	MDR	71	5,332	Gated	4.40	3.50	5.00

Note. MDR = Medium-Density Residential Zone.
HDR = High-Density Residential Zone
CMC = Commercial Zone
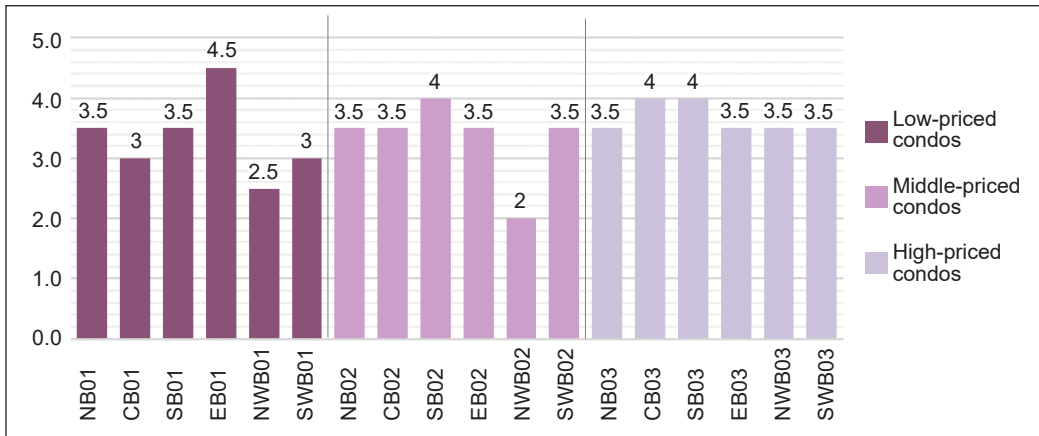
Figure 6. Comparative privacy setting score of condominiums by economic level (scale 1 to 5)
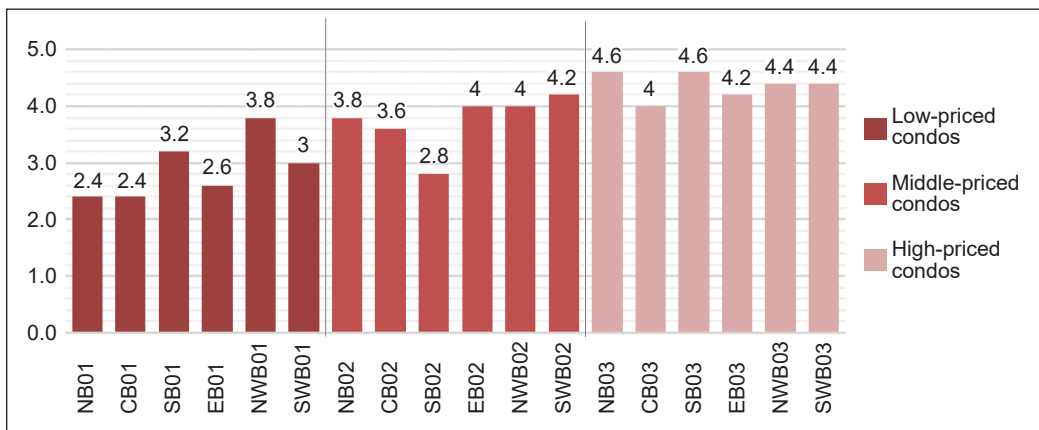
Figure 5. A comparative defensible setting score of condominiums by economic level (scale 1 to 5)
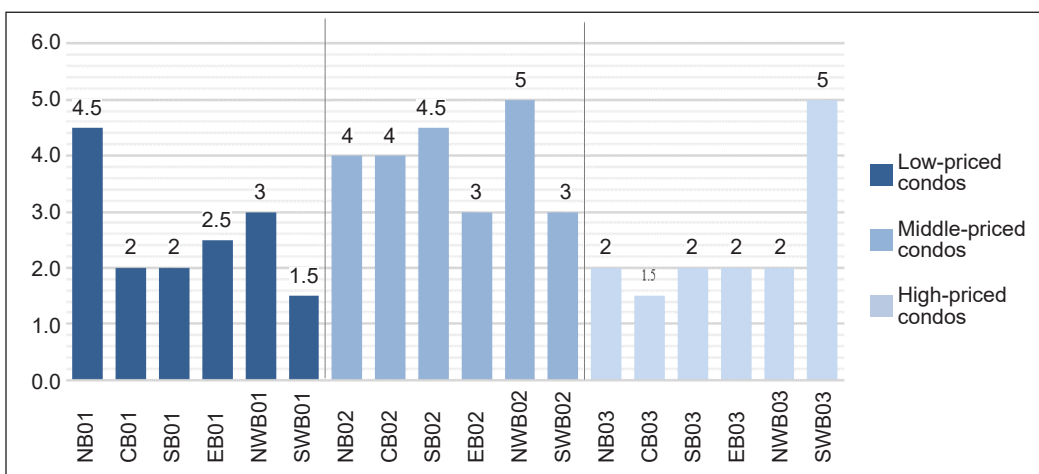
Figure 7. A comparative communal setting score of condominiums by economic level (scale 1 to 5)

amongst the respondents are the emergency concern (Q7 = elevator malfunction, and Q8 = failed emergency evacuation) and crime concern (Q3 strangers in the building) (Table 2). The results also illustrated that the samples were most satisfied with their physical privacy (Q13 = personal and daily routines and Q14 = relaxed and loose in the unit) while dwelling in their units, followed by informational privacy (Q11 = private conversation) (Table 2). The samples also reported their strong sense of membership (Q17 = feeling like a member of the condominium) and emotional connection with their condominium communities (Q24 = feeling bound with the condominium, and Q23 = feeling angry if someone criticises/ defames the condominium) consecutively (Table 2).

Results of Statistical Analysis

The various inferential statistic approaches applied during the analytical stage, for example, the Independent Sample t-test, Pearson product-moment Correlations (PPMC), one-way Analysis of Variance (one-way ANOVA), and the statistical power (Cohen's magnitude of effect size), answer the main research questions, which physical environmental factors significantly affect the mental wellbeing of condominiums' inhabitants and how different those effects are (Rujibhong, 2017).

Regarding the PPMC analysis results, significant relationships existed between independent (numerical) and dependent variables. Considerably, Pearson's r revealed small negative correlations

($r = -.207$) between the density of the population and the sense of community, feeling of membership ($r = -.168$), influence ($r = -.154$), reinforcement ($r = -.165$) and 4) shared emotional connection ($r = -.205$) significantly at $p < 0.01$ (Rujibhong, 2017) (See Table 3).

It also indicated small positive correlations between the privacy setting score of condominiums and the average privacy satisfaction score ($r = .09$), particularly the physical privacy ($r = .1$), significantly at $p < 0.01$ (Table 3). Other significant trivial correlations also exist, for example, weak negative correlations between the defensible setting score and safety concern and the sense of community scores, as well as weak positive correlations between the communal setting score and sense of community scores (Table 3).

The one-way ANOVA was applied to compare the effect of the categorical variables, such as land use and geographical zoning of the city.

The analysis accepted the alternative hypothesis (H_a), assuming considerable differences between the safety concern score and the sense of community score amongst the residents of different land-use zones ($p < .001$). However, a significant effect was not found on the privacy satisfaction score. The Post Hoc confirmed the more robust sense of community among medium-density residential area respondents than in other zones (Rujibhong, 2017).

Meanwhile, the one-way ANOVA results revealed the influence of geographical zoning on a safety concern, including behavioural

disorder score and emergency concern *(p < .05)*. Post hoc comparison showed that the safety concern of the respondents from the city's western side was greater than the eastern side. Besides, significant differences in the privacy satisfaction score were detected, including informational and physical privacy satisfaction *(p < .05)*. The Post hoc indicated greater privacy satisfaction amongst the respondents living in Northern Bangkok than those living on the city's south side.

Table 2
Summary of the PP questionnaire's scores (Likert scale 1 to 5)

	(n = 1,206) Question Items	Mean	S.D.	Factor Loading
	SAFETY CONCERN SCORE	2.638	0.978	α = 0.905
Q1	Crime in parking space	2.295	1.22	0.724
Q2	Lack of CCTV	2.707	1.292	0.732
Q3	Strangers in the condominium might be criminals	2.876	1.257	0.794
Q4	Someone jumps off the high floor	2.389	1.232	0.71
Q5	Drug-abusing people living in the condominium	2.594	1.261	0.781
Q6	Unhygienic condition of sharing facilities	2.513	1.218	0.725
Q7	Elevator's malfunction	2.879	1.279	0.723
Q8	Failed rescue operation/evacuation in case of emergency	2.849	1.325	0.717
	PRIVACY SATISFACTION SCORE	4.011	0.765	α = 0.894
Q9	Freely express emotions in the living unit	3.977	1.074	0.756
Q10	Being able to work on a concentration-required task in the living unit	4.014	1.022	0.793
Q11	Having a private conversation in the living unit	4.054	1.03	0.844
Q12	Receiving classified documents via the condominium's mailbox	3.871	1.035	0.688
Q13	Personal activities and daily routine	4.232	0.918	0.711
Q14	Being relaxed and loose in the living unit	4.265	0.9	0.735
Q15	Hanging out with family/friend (s) in the condominium's common areas	3.689	1.084	0.5
Q16	Inviting friend(s)/guest(s) to visit the living unit	3.982	1.058	0.644
	SENSE OF COMMUNITY SCORE	3.324	0.734	α = 0.885
Q17	Feeling like a member of the condominium	3.623	0.896	0.549
Q18	Condominium residents can recognise each other	3.242	1.043	0.661
Q19	Requests and complaints are always responded	3.175	0.972	0.682
Q20	Neighbours' opinions are beneficial	3.258	0.987	0.777
Q21	Happy to participate in events hosted by condominium members	3.175	1.014	0.81
Q22	Neighbours are kind and helpful	3.298	0.992	0.783
Q23	Feeling angry if someone criticises or defames a condominium	3.302	0.992	0.694
Q24	Feeling bound and happy to live in the condominium as long as possible	3.522	1.02	0.573

Table 3
Pearson product-moment correlations (PPMC) of independent variables and dependent variables

	VARIABLES	AVERAGE SAFETY CONCERN	Crime	Behavioural Disorder	Emergency	AVERAGE PRIVACY SATISFACTION	Psycho-privacy	Info-privacy	Physical-privacy	Social-privacy	AVERAGE SENSE OF COMMUNITY	Membership	Influence	Reinforcement	Emotional Connection
1	Density of Population (by district)	**.057***	.04	.068*	.03	**0.00**	.04	-.03	-.03	0.00	**-.207****	-.168**	-.154**	-.165**	-.205**
2	Defensible setting score	**-.070***	-.086**	-.03	-.066*	**.05**	.04	.03	.05	.04	**-.070***	-.092**	-.03	-.079**	-.04
3	Privacy setting score	**-.072***	-.04	-.084**	-.071*	**.090****	.095**	.075**	.100**	.03	**-.03**	.01	.00	-.062*	-.05
4	Communal setting score	**.01**	.03	.03	-.04	**-.05**	-.084**	-.05	-.04	0.00	**.061***	.05	.03	.05	.080**

Note. ** Correlation is significant at the 0.01 level (2-tailed).   * Correlation is significant at the 0.05 level (2-tailed).

.01 < | r | < .1 "Very small or weak correlation."
.1 < | r | < .3 "Small or weak correlation"
.3 < | r | < .5 "Medium or moderate correlation"
.5 < | r | "Large or strong correlation."
- Negative relationship
+ Positive relationship

A significant variance in the sense of community amongst Bangkok geographical zones was revealed, including the feelings of membership, influence, reinforcement, and emotional connection ($p < .001$). The Post hoc tests indicated that the respondents residing in Central Bangkok expressed the lowest sense of community than others (Table 4).

Considering the economic level of the community, significant differences in the economic status of condominiums on safety concerns ($p < .001$), such as crime, behavioural disorder, and emergency concerns, were discovered. The variances in privacy satisfaction, including the feelings of membership and reinforcement, were also found ($p < .005$). The Post hoc test reported a greater safety score among low-priced condominium residents than others (Table 4).

As mentioned earlier, there were two community types amongst the eighteen condominiums: gated and semi-gated communities. According to an independent sample t-test, respondents from gated and semi-gated neighbourhoods reported significantly different degrees of safety concern and sense of community. The respondents in gated condominiums were more concerned about crime and emergencies than those in semi-gated condominiums ($p < .004$). Furthermore, respondents living in semi-gated condominiums expressed a significantly higher sense of community than those living in gated condominiums, as well as significantly higher mean scores of memberships, reinforcement, and emotional

senses of community, respectively. Meanwhile, the privacy satisfaction score of these two groups of respondents was insignificant (Table 4).

DISCUSSION

The statistical findings of this study provide robust responses to the research questions and support the acceptance of the alternative hypothesis (H_1). Specifically, the results indicate that physical environmental factors, including urban, community, and architectural factors, exerted discernible effects on the mental well-being of condominium dwellers in terms of safety concerns, privacy satisfaction, and sense of community. These effects were observed to manifest in unique and distinct ways, further highlighting the significance of the physical environment in shaping the psychological experiences of residents (Figure 8).

Regarding architectural factors, specific unique attributes of the condominium, such as building height, were found to have an insignificant statistical effect. This finding aligns with previous research criticising the overestimated concern regarding building height (Stefanucci & Proffitt, 2009). As a result, the variable related to building height was excluded from the analysis.

The Impact of Urban Factors on the Mental Wellbeing of the Condominium Dwellers

Various urban factors, including geographical zoning, land use zoning, and population density, significantly influenced the respondents' safety

Table 4

Summary of statistical analyses of differences between groups by categorical predictors

Independent Variables	Land Use Zoning	Geographical Zoning	Economic Level	Type of Community
Dependent Variables	One-way ANOVA	One-way ANOVA	One-way ANOVA	t-test
Avg. SAFETY CONCERN	$F_{(2,1203)} = 10.197^{***}$	$F_{(5,1200)} = 3.899^{***}$	$F_{(2,1203)} = 9.736^{***}$	$t = 2.248^*$
Crime Concern	$F_{(2,1203)} = 11.271^{***}$	$F_{(5,1200)} = 1.859$	$F_{(2,1203)} = 12.738^{***}$	$t = 2.201^*$
Behavioural Disorder Concern	$F_{(2,1203)} = 7.661^{***}$	$F_{(5,1200)} = 5.566^{***}$	$F_{(2,1203)} = 5.292^{**}$	$t = 1.056$
Emergency Concern	$F_{(2,1203)} = 4.534^*$	$F_{(5,1200)} = 2.794^*$	$F_{(2,1203)} = 10.307^{***}$	$t = 2.902^{**}$
Avg. PRIVACY SATISFACTION	$F_{(2,1203)} = 2.044$	$F_{(5,1200)} = 2.324^*$	$F_{(2,1203)} = 1.801$	$t = .809$
Psycho. Privacy Satisfaction	$F_{(2,1203)} = 2.276$	$F_{(5,1200)} = .789$	$F_{(2,1203)} = 4.572^*$	$t = .944$
Info. Privacy Satisfaction	$F_{(2,1203)} = .804$	$F_{(5,1200)} = 2.542^*$	$F_{(2,1203)} = .211$	$t = 1.191$
Physical Privacy Satisfaction	$F_{(2,1203)} = 1.964$	$F_{(5,1200)} = .012^*$	$F_{(2,1203)} = 1.563$	$t = .900$
Social Privacy Satisfaction	$F_{(2,1203)} = 1.421$	$F_{(5,1200)} = 2.16$	$F_{(2,1203)} = 1.134$	$t = -.305$
Avg. SENSE OF COMMUNITY	$F_{(2,1203)} = 10.621^{***}$	$F_{(5,1200)} = 11.295^{***}$	$F_{(2,1203)} = 2.737$	$t = -3.337^{***}$
Membership	$F_{(2,1203)} = 6.379^{***}$	$F_{(5,1200)} = 8.326^{***}$	$F_{(2,1203)} = 3.742^*$	$t = -3.627^{***}$
Influence	$F_{(2,1203)} = 8.072^{***}$	$F_{(5,1200)} = 7.216^{***}$	$F_{(2,1203)} = 1.636$	$t = -1.698$
Reinforcement	$F_{(2,1203)} = 9.441^{***}$	$F_{(5,1200)} = 7.848^{***}$	$F_{(2,1203)} = 4.755^{**}$	$t = -2.533^*$
Emotional Connection	$F_{(2,1203)} = 7.134^{***}$	$F_{(5,1200)} = 10.857^*$	$F_{(2,1203)} = .500$	$t = -3.35^{***}$

Note. $^*p \leq .05$, $^{**} p \leq .01$, $^{***} p \leq .001$
The dataset was proved to conform to an assumption of a normal distribution considering the skewness and kurtosis between ± 2.
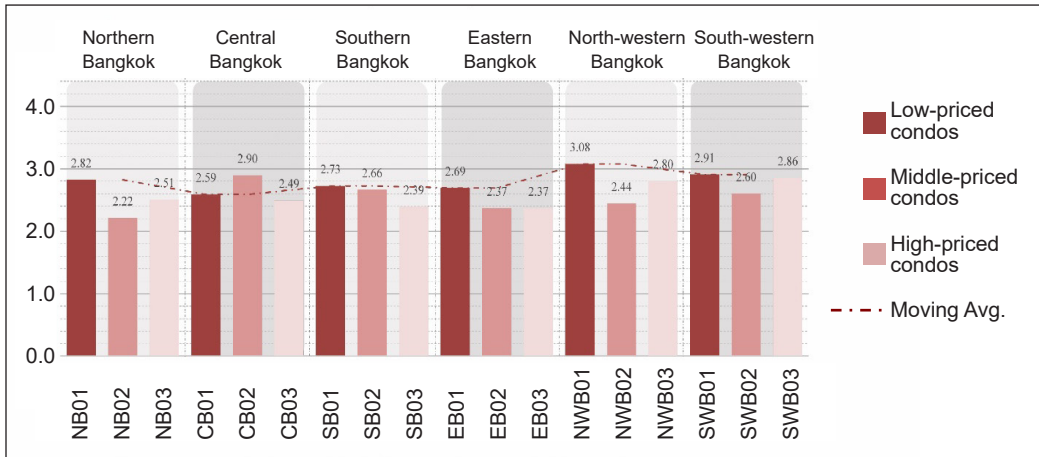
(a)
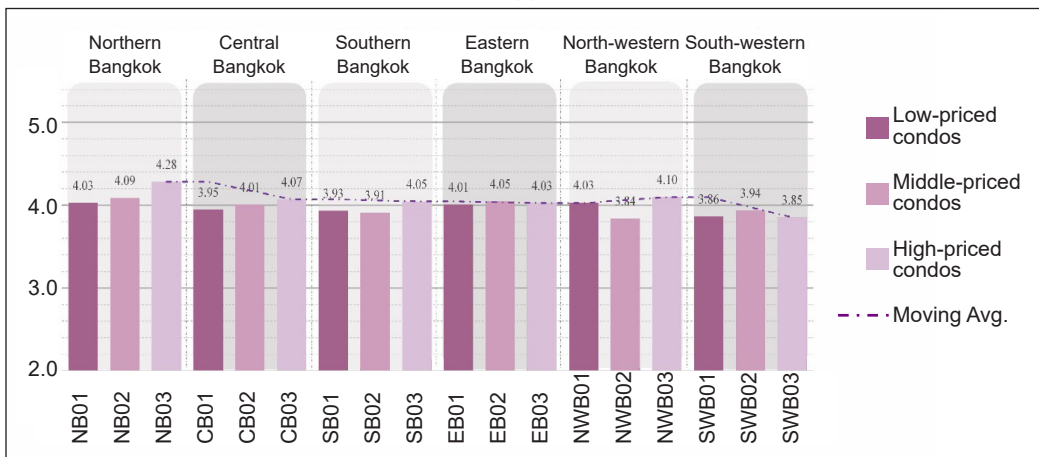
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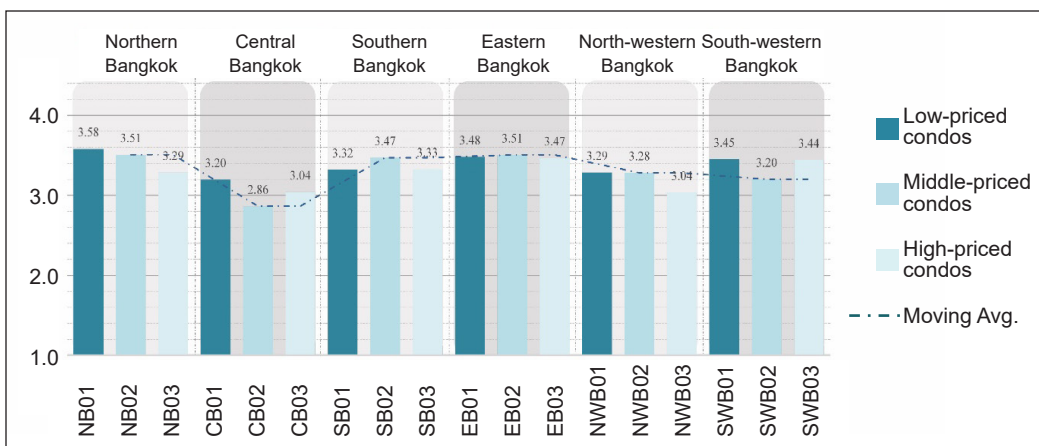
(c)

Figure 8. Comparative three psychological scores of eighteen condominiums: (a) safety concern; (b) privacy satisfaction; and (c) sense of community

concerns. Notably, individuals residing on the western side of the Chao Phraya River (Zone 5: Northwestern Bangkok and Zone 6: Southwestern Bangkok) exhibited considerably more pronounced concerns regarding the behavioural disorder and emergency evacuation compared to those residing on the eastern side of the river (Zone 1 to 4). This finding underscores the spatial variation in safety concerns within different zones, highlighting the significance of geographical location in shaping perceptions of safety amongst condominium residents (Rujibhong, 2017) (Figure 8).

Historically referred to as "Thonburi," the western side of Bangkok has exhibited a consistent vulnerability to seasonal flooding. Moreover, due to its proximity to the industrial district in Samutsakorn and Samutprakarn provinces, the area has become an appealing destination for migrant labourers from neighbouring countries, including Cambodia, Myanmar, and Laos (Office of Foreign Workers Administration, 2016). Additionally, there has been an observable presence of outlaw motorcycle gangs and drug dealers in this particular area. These contextual factors contribute to the distinctive characteristics and dynamics of the western side of Bangkok (Rujibhong, 2017).

The Impact of Community Factors on the Mental Wellbeing of the Condominium Dwellers

The community and architectural factors that affected the respondents' safety concerns were the community's economic levels. The degree of concern about safety amongst the respondents living in the low-priced condominiums was more significant than in the middle and high-priced condominiums. Based on the result of the PE assessment, the low-priced buildings could not maintain their physical environment as well as the middle and high-priced condominiums and earned a defensible score less than others.

The types of community also influenced the variation of safety concerns amongst the condominiums' residents. The findings revealed that the gated characteristic of condominiums became problematic since it excluded dwellers from the outside, increased fear, and discriminated against insiders from outsiders, as seen from the more significant concern about crime amongst the gated condominiums' residents than others.

The Impact of Architectural Factors on the Mental Wellbeing of the Condominium Dwellers

The condominiums' privacy attributes, (1) a smaller number of living units on each floor and (2) the number of dwellers per unit, were essential capacities that supported the privacy satisfaction of the residents. Besides, the building configurations that positively correlated with the residents' psychological and physical privacy were courtyard and single-loaded corridor arrangements rather than the double-loaded corridor.

In the sense of community, the negative relationship between the density of the

population and the respondents' feeling of membership, reinforcement, influence, and emotional connection was significantly revealed. This interpretation is consonant with several pieces of research that pointed out heterogeneity and density of population as the misery of urban life causing the overloading of people's cognitive function, which leads to social withdrawal and less interest in their community (Milgram, 1970; Rajendran et al., 2009).

The analysis of variance revealed a stronger sense of community amongst respondents living in medium-density residential neighbourhoods than those who lived in high-density residential areas. Moreover, the participants living in Central Bangkok expressed the slightest sense of community more than in other zones. The research findings are valuable for housing developers, as they demonstrate the benefits of operating residential high-rises in Central Bangkok, the country's business hub. Such developments provide residents convenient access to amenities, infrastructure, and economic opportunities. However, the findings also shed light on the challenges posed by the area's high cost of living, pollution, and rush-hour traffic. The double-time population density in Central Bangkok, combined with demanding routines and environmental factors, contributes to residents' fatigue and reduced inclination to engage with the community.

For the community factors, the results confirmed a more robust sense of community among semi-gated compounds' residents than the gated ones. This research statistically endorses the argument of the adverse effects of the gated community on condominium residents in Bangkok that living in such an environment considerably deterred people from connecting with neighbours, participating in social events and feeling bound with their community. The analysis also suggested that the defensible setting of condominiums negatively affected the residents' sense of community.

CONCLUSION

In conclusion, this study emphasises the importance of understanding the mental well-being of diverse residents in high-rise condominiums, considering the challenges of urban complexities, community diversity, and architectural constraints. As observed from the sampling group, the insights from Bangkok's urban psychology provide valuable information for housing developers. Despite the vast diversity of Bangkok's metropolis, neighbourhoods exhibit shared mental perspectives. Every community has distinct needs, concerns, pleasures, and ties to their living environments, all of which demand a thorough understanding. A foundation rooted in environmental psychology is essential to enhance high-rise housing projects in specific areas of Bangkok. Given the high population density, heterogeneity, and competitive lifestyles in Central Bangkok, it is recommended that future development plans for residential high-rises be either slowed down or reevaluated. Such considerations are vital to prevent threats to residents' sense of community and public mindfulness.

As previously discussed, the Floor Area Ratio (FAR) is a key metric the City Planning Department uses to control urban density. It represents the ratio of a building's total floor area to its plot size. It is suggested to ease regulations and increase the FAR specifically for residential buildings to promote high-rise housing development in medium-density zones rather than in Central Bangkok. Conversely, the FAR for new condominiums in commercial areas should be more restricted.

In addition to the urban factors mentioned earlier, the psychological wellbeing of condominium inhabitants was influenced by community characteristics. The research indicates that residents of semi-gated condominiums had a stronger sense of community. Interestingly, their concerns regarding emergency evacuation were lower than those living in fully gated condominiums. The perceived exclusivity, especially in upscale condominiums, can be counterproductive to fostering community spirit amongst residents. Designers and housing developers should eschew overly segregated designs. Instead, they should promote connectedness between residents and their surroundings by incorporating shared public spaces or transparent enclosures complemented by natural or green barriers.

Recommendations

From an architectural standpoint, creating a safe and secure condominium environment demands a thoughtful integration of spatial design and management strategies. It ensures that the living space exhibits its protective capacity and remains evident to its residents. Within the scope of this study, four primary components of a building's defensible features are highlighted: (1) access control, (2) surveillance, (3) territoriality, and (4) milieu and juxtaposition. These components are crucial in bolstering the perception of security amongst high-rise residents, especially in addressing concerns related to safety and crime.

Beyond the district's population density addressed earlier, this study also examines the impacts of residential density, specifically the number of units per floor and individuals within each unit. The data suggests that high floor density can compromise residents' psychological privacy and heighten concerns about behavioural disruptions. Conversely, high unit density tends to diminish residents' satisfaction with both psychological and physical privacy. Limiting these two density types mitigates potential stress among high-rise dwellers. Implementing the high-rise housing standards set by the National Housing Authority (NHA), such as specifying a minimum area per occupant, in upcoming residential high-rise public and private projects is deemed beneficial. Furthermore, managing privacy in living units housing more than two occupants becomes increasingly complex, especially among non-family members. Thus, in addition to the usual in-unit divisions, offering shared multi-functional areas, like co-working spaces, libraries, and common living or meeting rooms, can assist residents

in adjusting their personal and group privacy levels to meet their needs.

Given the verified impact of communal attributes on the sense of community, it becomes imperative to value diverse recreational facilities as fundamental amenities for condominium residents. According to the NHA's housing standards, regulations mandate a minimum area ratio for retail and green spaces in community areas, but these are only enforced in public housing projects. Expanding these recreational and communal area ratios and applying them universally to all new residential high-rise developments, whether by public or private entities, is recommended to address this disparity. In addition to the ratio of recreational and communal areas, the accessibility and visibility of these facilities are viewed as key communal factors that foster a sense of community and social interaction among residents. Condominium developers are also encouraged to incorporate sociopetal space planning in these areas. This specific spatial design promotes enhanced visual continuity and richer communal experiences among residents and bolsters natural surveillance, thereby augmenting feelings of safety.

The research was conducted during the pre-coronavirus pandemic era, where respondents primarily expressed concerns about safety and security stemming from human-induced threats, such as building malfunctions and crimes. Interestingly, the unhygienic condition of buildings ranked fifth in their concerns, a factor that would likely rank higher today. The pandemic and subsequent shifts in daily living have prompted urban dwellers, including condominium residents, to alter their behaviours and routines significantly. Future studies should emphasise the hygiene standards in multifamily residences to mitigate the spread of infectious diseases and develop more sustainable condominiums. It includes introducing new design methodologies and implementing adaptive solutions for existing structures.

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SOCIAL SCIENCES & HUMANITIES

Influence of Perceived Soundscape and Sound Environment on Subjective Well-being of Park Visitors

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ABSTRACT

Urban parks are public leisure areas that stimulate good feelings and alleviate stress. Studies of park soundscapes have shown that natural soundscapes are associated with higher restorations after park visitations. Little is known whether different parks with similar sound sources would result in different perceived subjective well-being and stress reduction of the park visitors. This paper offers deeper insight into the Malaysian parks' perceived soundscapes and highlights the effects after visitations on subjective well-being and stress reduction. On-site surveys were conducted in four selected parks in Kuala Lumpur and Putrajaya, with 428 park visitors as the study's sample. From March to May 2022, respondents were recruited with random sampling method. Acoustic measurements and perceptual responses to the park's soundscape were recorded during the survey sessions. The relationships between objective and subjective measurements of the environment with perceived subjective well-being of the park users were evaluated with Spearman's correlation tests. Findings revealed that sound levels of the parks from objective measurements differ from the perceived loudness of the park. Perceived soundscape is correlated with subjective well-being and sound environment with the satisfaction level of the park users after visitations. The findings also suggest that sounds from activities in parks increase the park users' soundscape experience and well-being. These results implicate Malaysian park planning and management by serving a further understanding of the relationship

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between the soundscape of the parks and how they improve the well-being of park users.

Keywords: Parks, sound environment, soundscape perception, stress, subjective well-being

INTRODUCTION

Rapid population growth in urban centres has increased the pressure on urban infrastructures, resources, services, and natural ecosystems. In Malaysia, urban public parks improve mental health and provide opportunities for physical activities (Adiati et al., 2018; Grilli et al., 2020; Sakip et al., 2018). Urban parks also provide physiological and psychological benefits compared to urban surroundings (Mokhtar et al., 2018). However, some still argue that the parks in Kuala Lumpur do not offer enough relief from the pressures of city life (Alidi & Ismail, 2019). According to Samad et al. (2021), the urban parks in Malaysia have not attained an adequate level to provide residents with a healthy environment. The increase in urbanisation has reduced the quality and quantity of nature experience (Razak et al., 2016).

Public spaces are essential for meetings and social interactions as it improves mental health while contributing to the well-being of the communities. Numerous studies have examined the advantages of green spaces in cities from their social, economic, and environmental values (Jabbar et al., 2021; Sander & Zhao, 2015; Scopelliti et al., 2016). These urban green spaces promote physical exercise, relaxation, socialisation,

and stress reduction (Dadvand et al., 2016; Grahn & Stigsdotter, 2010). Recent research has linked various characteristics of urban parks to their advantages and boost the cities' liveliness (Brown et al., 2014; Chiesura, 2004; Dadvand et al., 2016; Scopelliti et al., 2016; Tzoulas et al., 2007). Sakip et al. (2015) and Ngesan et al. (2013) further highlighted that public park offers interrelationship between the community and increases the values of properties.

Physical activities in natural setting have improved well-being (Barton & Perry, 2010; Thompson et al., 2011;). Residents reported frequent use of urban parks to have greater happiness and life satisfaction and lower psychological discomfort and anxiety (Coldwell & Evans, 2018; Konijnendijk et al., 2013). A duration of at least 20 minutes in the park is associated with subjective well-being scores and the improvement of life satisfaction scores (Yuen & Jenkins, 2020). Human reactions to acoustics may reflect motivational and emotional processes, as evidenced by a preference for one setting and the avoidance of another (Van den Bosch et al., 2018). Thus, more recent studies have shifted to identifying the impact of the environment on the well-being of park users to include the comfort of the acoustic environment (Shao et al., 2022).

Acoustic Environment and Effect on Park Visitations

The acoustic environment is important for providing a great visitor experience in recreational spaces as noise control is

recommended for parks with high levels of sound environment (Merchan et al., 2014). Noise levels higher than World Health Organisation's (WHO) recommendation for outdoor spaces (55dB) may cause interference in speech intelligibility and inconvenience in communicating and relaxing in these spaces. However, only lowering noise levels does not always result in a more favourable assessment of the surroundings (Van den Bosch et al., 2018).

Perceived Soundscape and Effect on Park Visitations

Soundscape is the combination of all sounds at a given location, emphasising on the relationship between an individual or the society's sound perception (International Organisation for Standardisation, 2014). The soundscape approach considers the acoustic environment based on the interactions of sound sources, environment, and humans. It is defined as the acoustic equivalent of a landscape and comprises all desired and undesired sound sources (Eleinen et al., 2016). The experience of park users is linked with the landscape and soundscape of the park (Brambilla et al., 2013; Liu et al., 2013; Liu et al., 2014; Tse et al., 2012). Steele et al. (2015) also discovered that the appropriateness and pleasantness of soundscape are influenced by the activities carried out in the areas.

The prevalence and dominance of sound sources mediate the relaxing experience in the park. Urban parks' acoustics mirror their surroundings and enhance the natural experience (Krause et al., 2011). Based on

the taxonomy of soundscape data collection in previous studies (Brown et al., 2011; Jo & Jeon, 2021), natural sounds include birds chirping, water flowing and leaves rustling, traffic sounds from vehicles and traffic around the park, human activities like people talking, children shouting, and sounds from other sources such leaves blower, constructions. Natural sounds ease stress, anxiety, and agitation and aid emotional recovery. Physiological signs such as skin conductance level, heart rate and variability support the restorative benefits of the parks (Annerstedt et al., 2013; Jo et al., 2019; Medvedev et al., 2015; Suko et al., 2019). Results of studies by Axelsson et al. (2010) suggest how soundscape may be defined in terms of eventfulness and pleasantness. The significant implication of soundscape in urban planning and design is not only to decrease noise pollution but to use sounds as an environmental resource in creating pleasant spaces for psychological restoration (De Coensel et al., 2010; Rehan, 2016).

Soundscape and Subjective Well-being

Some authors have studied the emotional impacts of soundscape on public parks (Fiebig et al., 2020; Han et al., 2022; Hedblom et al., 2017; Irvine et al., 2009; Jahncke et al., 2015; Masullo et al., 2021; Qiu et al., 2020; Ratcliffe, 2021; Van den Bosch et al., 2018). Ma and Thompson (2015) found that human emotions are dependent on sound acoustics, while Choi (2015) observed that environmental sounds could elicit pleasant emotions. Soundscape and acoustic satisfaction affect overall

physical environmental satisfaction (Gozalo et al., 2019; Jo & Jeon, 2020; Kang & Zhang, 2010).

Since 2010, soundscape and subjective wellbeing have been studied using multiple definitions and metrics (Aletta et al., 2019; Alvarsson et al., 2010; Benfield et al., 2014; Kang et al., 2016; Moscoso et al., 2018). Studies focused on the improvement of moods from natural sounds (Benfield et al., 2014; Hartig et al., 2014) and expanded to include various health benefits such as restoration (van Kamp et al., 2015) recovery from physiological stress and other stress-related mental disorders (Cerwen et al., 2017; Kang et al., 2016). Recent studies include well-being index, and other cultural and social wellness such as positive feelings and health-related well-being (Aletta et al., 2019; Bates et al., 2020; Moscoso et al., 2018). Weijs-Perree et al. (2020) discovered that satisfied public space users were happier through experience sampling method (ESM).

While studies relating to presence of greeneries and wellbeing has been well-documented, little is known about the relationship between soundscapes with subjective well-being. Mavoa, Davern et al. (2019) and Mavoa, Lucassen et al. (2019) investigated the relationship between subjective well-being and the natural environment with spatial analysis. Individuals with positive soundscape experience reported higher levels of well-being compared to those of negative experiences (Aletta et al., 2019). Kim (2020) and Ren et al. (2018) explored the influence of cultural frameworks on auditory environment and found distinct differences in the semantic value of descriptors and relationship between preferred auditory environment and expectations between East-Asian and North-American listeners. This research adapted the focus on parks and subjective well-being but approaches the study with an in-situ method in parks of Malaysia as Asian and Western countries perceived soundscapes differently (Axelsson et al., 2010; Fang et al., 2021; Jeon & Hong, 2015; Kim, 2020; Ren et al. 2018).

In Malaysia, soundscape approach has been introduced in highlands (Din et al., 2017); campus landscape area (Mohd et al., 2017) and urban shopping streets (Abdul Hamid et al., 2023) but not in urban parks. Therefore, this research proposed to apply the soundscape method in urban parks based on measurements of soundscape perception by Axelsson et al. (2010). This study addresses the geographical and socio-cultural gap on the auditory influences of park's environment towards enhancing and improving subjective wellbeing of the park visitors in Malaysia. It investigates how park's soundscape affect subjective well-being of park users based on the objective measurements of sound level, and soundscape descriptors. In-situ assessments were carried out in the selected parks to obtain information on the acoustic readings and subjective responses to the acoustic environment.

Theoretical Underpinnings

This study uses the soundscape ecology model to examine people-place-interaction in the parks from an auditory perspective. It

investigates how space and preference affect sound perception (Aburawis & Dokmeci, 2018; Herranz-Pascual et al., 2010). The conceptual framework (Figure 1) in ISO 12913-1 (International Organisation for Standardisation, 2014) highlights context influences sound sources, perception, and cognitive processes and responses. Environmental ecology theory suggests that people's responses to the environment, experience, mood and preferences relate with how they perceived the environment (Abuwaris & Dokmeci Yorukoglu, 2018; Herranz-Pascual, 2010).

METHODOLOGY

Selection of Urban Parks

This study focused on the soundscape perception of the park respondents in Kuala Lumpur and Putrajaya, the nation's capital and Malaysia's national federal administrative capital, to reflect an urban setting. The effect of the park soundscapes on the subjective well-being of the park

visitors was based on the characteristics of the four selected parks: (1) highly accessible and frequently visited by the community, (2) location of parks: suburban/urban, (3) activities in the park and (4) sound sources within the park (Table 1). All four urban parks (40 hec to 100 hec) have a similar hierarchy function in providing leisure and recreational facilities for the demands of a growing urban population (Town and Country Planning Department Peninsular Malaysia, 2021). The three parks in Kuala Lumpur were selected from the smaller urban parks (40 hec), while Putrajaya Botanical Garden was chosen for its large-scaled size, representing big urban parks with comparable qualities.

KLCC Park (50 acres). KLCC Park is located in the central business district of Kuala Lumpur outside Suria and Petronas Twin Towers, features an iconic lake symphony, jogging and walking trails, and wading pool for children with cascading waterfall.
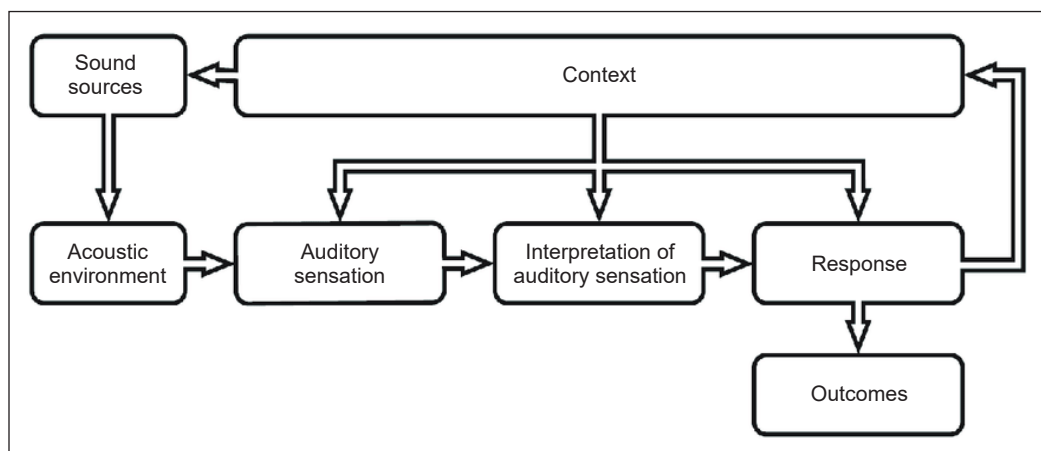
Figure 1. Conceptual framework of soundscapes (source from International Organisation for Standardisation, 2014)

Table 1
Characteristics of the selected parks

No.	Park	Type of park	Description	Size (ac)
1	KLCC Park	City Park (Urban Park)	Smaller hardscape and landscaped spaces for a highly intensified urban environment in the city center, provide breathing spaces for people to gather, socialise, rest and relax	50
2	Taman Tasik Permaisuri	District Park (Suburban Park-7 km from city center)	Densely surrounded by several residential areas and is integrated with other sports and recreational facilities in the neighbourhood	122
3	Bukit Jalil Recreational Park	District Park (Suburban Park-20 km from city center)	Located on hilly terrain and surrounded by ongoing developments in the district, commercial buildings and residential areas and a golf resort. Also integrated with other sports and recreational facilities in the neighbourhood	80
4	Putrajaya Botanical Garden	Metropolitan Park (Urban Park)	Located in the Putrajaya, often referred as "City in the Garden", the park is adjacent to the largest man-made pond and a neighbouring park	230

Bukit Jalil Recreational Park (80 acres). Bukit Jalil Recreational Park is in a developing district in the southern suburbs of Kuala Lumpur, with numerous ongoing developments. The park is situated on gently sloping terrain, neighbouring the Lebuhraya Bukit Jalil and well equipped with children's playground, picnic spots and lake in the park.

Taman Tasik Permaisuri (122 acres). Taman Tasik Permaisuri is located in the suburban areas of Kuala Lumpur with dense residential areas surroundings. It houses a lake with fountains, shady picnic spots, equipped with a football and futsal court and landscaped on naturally hilly terrain. The jogging trails were left in a raw natural state in the southern section of the park.

Putrajaya Botanical Garden (230 acres). Putrajaya Botanical Garden is located in a relaxed urban setting due to the city's function as an administrative capital. Park visitations during the weekday are relatively low. The park overlooks a man-made lake and offers activities such as explorer trails, canopy bridges, and various collections of botanical plants across the park. Figure 2 shows the location and surroundings of the selected parks.

Data Collection and Sampling of Respondents

The questionnaire survey was conducted for three months, on sunny, breezy days, from March to May 2022. Prior to the survey, a soundscape checklist of the selected study areas was conducted to note the predominant sound sources identified from the study areas as shown in Table 2.

The respondents' perceptions of the park's soundscape were gathered. The sample size was selected based on prior soundscape research, which stipulated that the total valid responses should be

Figure 2. Study location of selected parks in Kuala Lumpur and Putrajaya: (a) KLCC Park; (b) Taman Tasik Permaisuri; (c) Bukit Jalil Recreational Park; and (d) Putrajaya Botanical Garden (source from Google, 2019)

Table 2

Predominant sound sources identified in the study areas

Type of sounds	Predominant sound sources identified
Natural sounds	Birds chirping, water flowing, leaves rustlings, monkeys, insects
Traffic sounds	Motorised traffic, honking of vehicles
Sounds from other sources	Constructions, ventilations, leaf blower, music, radio
Sounds from human activities	Laughter, children cries, speech, singing

greater than 100 (Kang & Zhang, 2010). A total of 428 responses were gathered throughout the study using random sampling. Approximately 100 participants at each site were asked to complete a questionnaire that comprised the scaling of eight perceptual attributes on a five-point Likert scale: pleasant, unpleasant, calm, uneventful, monotonous, chaotic, eventful, and vibrant, ranging from "strongly disagree (1)" to "strongly agree (5)" which was based on a similar tool to measure soundscape perception used by Axelsson et al. (2010), Fang et al. (2021) and Liu et al. (2013). Five-point Likert scale was also employed to measure the dominance of sound sources, namely "do not hear at all (1) to dominate completely (5)." The questionnaire covers the following aspects:

  (a) Sounds heard in the park, including traffic sounds, nature sounds, human sounds, and other noises
  (b) Soundscape perception is based on perceptual attributes of pleasant, calm, uneventful, monotonous, chaotic, eventful, and vibrant.
  (c) The perceived loudness of the park
  (d) Satisfaction with the park's soundscape
  (e) Effect of soundscape experience in the parks, such as stress level, subjective well-being: life satisfaction, and happiness level

Variables and Measures

This study employed studies of the park soundscapes based on three aspects: objective acoustic environment by equivalent continuous sound pressure level (Shao et al., 2022), subjective acoustic environment, measured by perceived sound intensity (Engel et al., 2016; Kang & Zhang, 2010; Kuwano et al., 1991) and perceived soundscape by the dominance of sound sources (Jeon & Hong., 2015; Liu et al., 2013), and soundscape perceptual attributes (Axelsson et al., 2010; Hong & Jeon, 2013). The subjective well-being measures are based on a single-item Likert scale to measure happiness and satisfaction after park visitation (Yuen et al., 2020).

Objective Acoustic Environments. The acoustic measurements were measured based on the on-site sound walk method. Different observation sites were sampled due to the different sizes of these urban parks, with 20 points in KLCC Park, 27 points in Bukit Jalil Recreational Park, 24 points in Taman Tasik Permaisuri and 34 points in Putrajaya Botanical Garden, respectively (Figure 2). The SL-5868P sound level meter, held at a height of 1.5 meters above ground and at least 3.5 meters away from any sound-reflecting walls, buildings or other structures, is used to measure the sound pressure level. A-weighted continuous equivalent sound level (LAeq), the standard weighting method for outdoor measurements to represent the loudness of sound perceived by human ears for a real human reaction to the level of intensity and discomfort (Guo, 2019), was measured in dBA values along park routes. Mean values of the sound pressure level were then calculated for each park.

Subjective Acoustic Environment. Subjective measurements of the environment in the selected parks were measured based on a 5-point Likert scale regarding perceived overall sound intensity (Engel et al., 2016; Kang & Zhang, 2010; Kuwano et al., 1991). Mean scores of three and above signify that the selected park is louder than expected, while those below three refer to quieter parks than expected.

Perceived Soundscape. The data collection used in the study adopted the Soundscape Indices (SSID) Protocol, which was based on Method A of the ISO/TS, 2018 (Aletta et al., 2020; International Organisation for Standardisation, 2018; Lionello et al., 2021; Mitchell et al., 2020). The questionnaire focuses on how people perceived the soundscape by identifying sound sources at the park with a 5-point Likert scale: traffic noise, human sounds, natural sounds, and other noises. The perception of the soundscape was also evaluated with adjective attributes taken from prior research (Axelsson et al., 2010; Hong & Jeon, 2013).

Pleasantness and eventfulness to measure soundscape dimension are then calculated using Equations [1] and [2], respectively, based on the affective quality responses (International Organisation for Standardisation, 2019):

$Pleasantness = \{(p - a) + \cos45° (ca - ch) + \cos45°(v - m)\}/ (4+\sqrt{32})$ [1]

$Eventfulness = \{(e - u) + \cos45° (ch - ca) + \cos45° (v - m)\}/ (4+\sqrt{32})$ [2]

where p is pleasant, a is annoying, ca is calm, ch is chaotic, e is eventful, u is uneventful, v is vibrant, and m is monotonous.

Subjective Well-being. The subjective well-being of the soundscape experience in the parks is examined in the third section of the questionnaire using single-item satisfaction and happiness questions (Cheung et al., 2014; Guo et al., 2019; Lukoševičiūtė et al., 2022), as well as perceived reduction in stress level. According to Cheung et al. (2014) and Lukoševičiūtė et al. (2022), when compared to multiple items' subjective well-being scales, single-item satisfaction and happiness level performed similarly. The reliability coefficient of the indicators for subjective well-being indicator was estimated at 0.80 (Cronbach's alpha), considered a good consistent variable to the scale.

Data Analysis

Statistical parameters were calculated using IBM SPSS Statistics 27.0 based on data from questionnaire surveys and sound pressure level measurements. The background of the respondents is as shown in Table 3. Park respondents consisted of both foreigners and locals who are visiting the park as Kuala Lumpur is home to diverse expatriates residing in the city. ANOVA test was carried out to identify the effect of soundscape experience on stress, happiness, and satisfaction level after park visitation. Spearman's rho correlation analysis was carried out to identify the relationship between perceived soundscape and sound

Table 3
Background of respondents

Variables	KLCC Park	Bukit Jalil Recreational Park	Taman Tasik Permaisuri	Putrajaya Botanical Garden
Gender, N (%)				
Male	49.2	53.5	62.9	66.7
Female	50.8	46.5	37.1	33.3
Ethnicity, N (%)				
Malay	35.6	32.0	20.0	32.0
Chinese	31.4	49.5	51.4	49.5
Indian	18.6	16.5	25.7	16.5
Others	14.4	1.9	2.9	1.9
Age, N (%) (years)				
18 - 25	22.9	15.8	16.2	18.6
26 - 35	28.8	34.7	27.6	20.6
36 - 45	28.0	30.7	21.9	31.4
46 - 55	12.7	5.0	13.3	15.7
56 and above	7.6	13.9	21.0	13.7
Noise Sensitivity, N (%)				
Sensitive	42.4	19.0	28.4	31.1
Not Sensitive	57.6	81.0	71.6	68.9

sources from the parks and the correlation between eventfulness and pleasantness with the sound levels of the park. PCA analysis was also carried out on the soundscape perceptions of the park visitors.

FINDINGS AND RESULTS

Characterisation of the Park: Sound Environment and Soundscape

Characterisation by the Sound Environment. The public park with the highest acoustic levels was KLCC Park and Bukit Jalil Recreational Park, at a mean of 63.18 and 60.4 dBA LAeq, respectively (Table 4). All four parks exceeded the recommended decibel of 55dB of LAeq for outdoor playgrounds. Sound levels in parks could vary considerably between the different park types and locations. According to an ANOVA test, the sound levels were significantly different among the locations (F value = 38.328, p <.001). Noise levels were higher in KLCC Park and Bukit Jalil Recreational Park, surrounded by developments and heavy traffic.

These differences in the perceived sound level were statistically significant $(X^2 = 69.653; df = 3; p < 0.001)$. The perceived sound level at Putrajaya Botanical Garden was considered the lowest (mean = 1.90, std dev = 1.09), similar to the objective sound level measurement among the four study areas, while Bukit Jalil Recreational Park, the second noisiest park by objective measurement, is considered louder than expected (mean = 3.92, std dev = 1.15).

Table 4

Characterisation of the selected parks by sound environment and perceived soundscape

		KLCC Park	Taman Tasik Permaisuri	Bukit Jalil Recreational Park	Putrajaya Botanical Garden
Objective	dB $L_{Aeq, mean}$	63.18 (±2.90)	58.06(±3.35)	60.4 (±3.30)	55.57 (±4.44)
Subjective	Perceived loudness	2.75 (±1.27)	3.75 (±1.05)	3.92 (±1.15)	1.90 (±1.09)

Note. Subjective measurements measured by a 5-point likert scale

KLCC Park, with the highest sound pressure level of 63.18 dBA, scored a mean score of 2.75, indicating that the perceived loudness of the soundscape is within the park visitors' expectations due to its location in the central business district of Kuala Lumpur. In relation to the above, the perceived loudness in the parks may differ from the results of objective sound level measurements in accordance with the expectations of the park users regarding the space. It is because the individual's subjective perception and preference, as well as other social and cultural factors, strongly influence the objective and subjective evaluations of sounds (Hall et al., 2013).

Characterisation by the Perceived Affective Quality of the Soundscape. Though simple sound level measurements are the most often used techniques to evaluate sound quality (Hall et al., 2013), lowering the sound level of an area does not always improve acoustic comfort (Kang & Yang, 2002). All four parks were examined for sound dominance as shown in Figure 3. Traffic noises can be heard in all four parks, regardless of location or size, but they do not dominate the soundscape as they do in most urban environments because respondents recalled other categories of sounds more

prominently. This reveals that Malaysian parks have similar soundscapes, dominated by natural noises like birds, insects, and leaves rustling. Whether the parks are situated along a major highway like Bukit Jalil Recreational Park or in a bustling urban centre like KLCC Park, traffic noise does not drown out other sound sources.

The park environment is also characterised by its perceived affective quality. It can be summarised from the results that 'eventfulness' and 'vibrancy' were considered significant characteristics of the park soundscapes in Putrajaya Botanical Garden, while the other three parks reflect 'calmness' and 'pleasantness' as the significant characteristic of the park soundscapes. It reflects the functions of the park, where many team-building and family day events are held in Putrajaya Botanical Garden over the weekends, contributing to the eventfulness and vibrancy of the soundscapes in the park, whereas the other three parks reflect recreational and leisure purposes. Overall, the park users' attitudes towards all four park soundscapes were positive. The eight perceptual attribute dimensions (Figure 4) were then projected onto the orthogonal model of soundscape (Figure 5). The orthonormal projection is based on the assumption that the participants
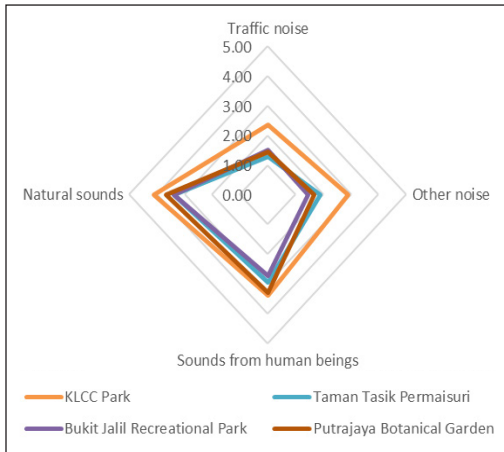
Figure 3. Comparison of the sound profile in the parks
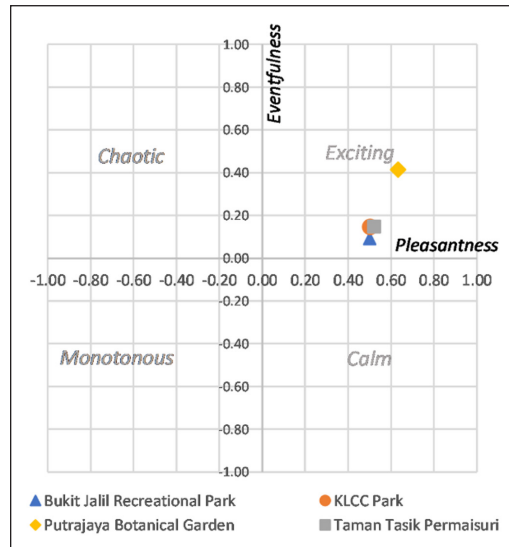
Figure 5. Pleasantness and eventfulness of the soundscapes on ISO complex
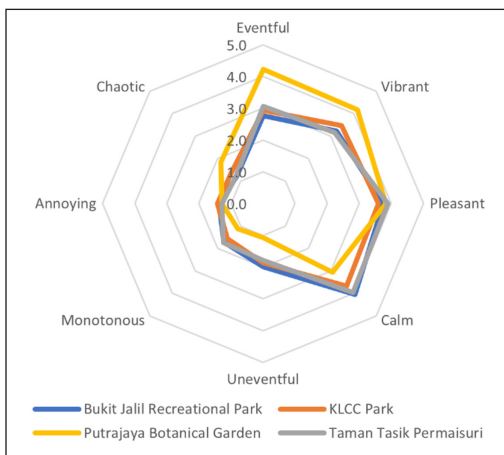
Figure 4. Perceived soundscape of the parks

in public spaces would suggest so to reflect a tranquil area for relaxation (Axelsson et al., 2010; Guo, 2019). The most pleasant environment corresponded to Putrajaya Botanical Garden due to its dominance of natural sound sources in the botanical park and the lowest sound level reported among all four parks.

interpret single Likert scale categories as equidistant and the eight perceptual attributes as connected according to the circumplex model.

Each symbol in Figure 5 corresponds to one of the study areas described in the legend. It can be noted from Figure 5 that all the parks were classified as 'Exciting' (second quadrant). Interestingly, not a single park in the selected sites was assessed as calm, as most of the research on soundscapes

The soundscape perception in the other three parks was rated similarly in terms of 'pleasantness' and 'eventfulness', but Putrajaya Botanical Garden scored higher on 'pleasantness' due to the park's location in an area with only traffic during peak hours. The other three parks are surrounded by developments and neighbouring busy traffic. It is consistent with the results that mentioned that environments with the predominant presence of traffic were classified as chaotic and annoying (Kogan et al., 2016; Van den Bosch et al., 2014; Yang et al., 2019). Uebel et al. (2022)

also concluded that anthropogenic noise is connected with unpleasant experiences within parks, similar to the three selected study areas. The dominance of traffic noise from outside the park's boundary during the may influence the result in low 'pleasantness' scores despite the high 'eventfulness' score in the parks. The 'eventfulness' of the park's soundscape may be attributed to the sections of the park where human sounds and various bird sounds were dominantly heard in these parks. Putrajaya Botanical Garden scored higher on 'eventfulness' scores due to the activities and events occurring in the park, especially during the evenings and weekends.

Perceived Soundscape Experience on Subjective Well-being and Stress Reduction

Figure 6 depicts the mean scores of the total number of observations for each reported subjective well-being in terms of happiness and satisfaction level and reduction of stress level from the park soundscapes at the end of the park visits.

The high perceived subjective well-being of the respondents reflects those who are in the parks for at least 16–60 minutes, where positive emotions such as happiness and satisfaction increased while stress levels were reduced. It is in line with numerous studies that agree that being in a park for 15–50 minutes improves the psychological quality of life and increases restoration (Bratman et al., 2015; Tyrväinen et al., 2014). It is clear from the figure above that the soundscape in Putrajaya Botanical Garden has resulted in the highest increase in subjective well-being, with mean scores of over 4.0 for all three aspects, while Taman Tasik Permaisuri scored the least for stress reduction and satisfaction level among the four parks with mean scores of 3.86 and 3.69, respectively. This can be explained by the expectations of having access to urban parks, which is in line with findings from Cheng et al. (2021) that access to urban parks increases the residents' expressed happiness and that happiness benefit is highest in parks larger than 100 acres (Schwartz et al., 2022).
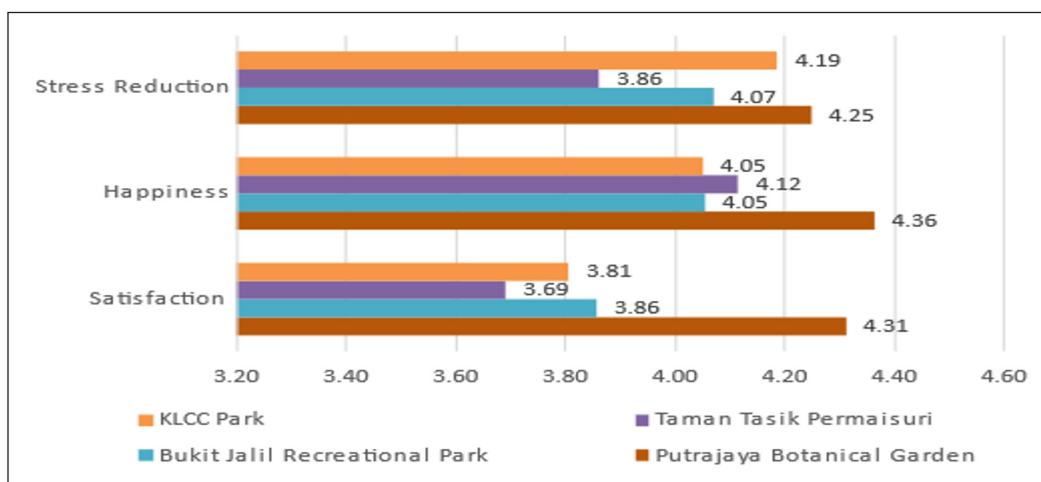
Figure 6. Subjective well-being of the respondents after park visitation

KLCC Park showed a significant decrease in stress level with a mean score of 4.19, and an increase in happiness level with a mean score of 4.05. Bukit Jalil Recreational Park, on the other hand, scored moderately among the four parks in all aspects of the perceived emotional effects after the park visitation.

ANOVA test was carried out to identify if the mean scores of the emotional effects of park visitation differ from the selected parks. Even though apparent differences emerge between the selected parks for the decrease in stress levels, they do not reach statistical significance (Figure 6). The subjective well-being of the park users, measured by the sum of happiness level and satisfaction level, is statistically significant, indicating a difference between the mean scores of the subjective well-being after park visitation ($F_{3,\,427}$ = 4.309, p = 0.05). It reflects that the perceived soundscape of the parks has significant differences among the four selected parks in terms of improving the subjective well-being for happiness and life satisfaction levels after park visitations.

Relationship Between Perceived Soundscape, Sound Environment and Subjective Well-being. Further analysis was carried out to determine the relationship between perceived soundscape and sound environment with the impacts after park visitations. When the pleasantness of the soundscape increases in KLCC Park and Taman Tasik Permaisuri, the satisfaction level of the respondents also increases. The pleasantness of the soundscape also significantly influences the decrease in

the stress level of the respondents and the increase in happiness level (r_s = .260, p < 0.01; r_s = .290, p < 0.05) after visitation in KLCC Park. The eventfulness of the soundscape showed no statistical significance in influencing the well-being of the park respondents. The findings are partially in agreement with Yang (2022), who discovered that pleasantness is positively correlated with greenspace; but differs where eventfulness is negatively correlated with green spaces. Therefore, it is suggested that the effect of eventfulness may differ according to the context of the study.

When correlated with the sound pressure level in the parks (LAeq) and perceived loudness of the sound levels in the park, there are some significant correlations between the variables with the satisfaction level of the park users. The sound pressure level of the KLCC park (LAeq) and the perceived loudness are both significant negative correlated with the satisfaction level of the park users (r_s = -.194, p < 0.05; r_s = .214, p < 0.05). The higher correlation coefficient (r_s =0.214 vs r_s = 0.194) demonstrates the relationship between the expectation of loudness in the park soundscape and the objective sound pressure level measurement, where the perceived loudness impacts the subjective well-being the park users more. It is similar to Putrajaya Botanical Garden, located in a quiet urban area by a large lake and major roads into the city. Therefore, the perceived loudness of the parks is within the expectations of the park users and correlates significantly with the satisfaction level of

the park respondents (r_s = -.218, p < 0.05). The other two parks' perceived loudness and sound level showed no significant correlation with subjective well-being and stress reduction. The findings suggest that the perceived loudness and sound level of the park influence the park users' subjective well-being, especially towards the satisfaction level after visitations. It is also related to how these two parks were categorised as exciting compared to the usual calm environment. The results also demonstrated different soundscape preferences from the four parks, with the sound pressure level of the soundscapes in Putrajaya Botanical Garden and KLCC Park influencing the subjective well-being of the

park users and pleasantness of soundscape reflective in the four parks of the study area. The relationship between perceived soundscape and the perceived subjective well-being at each park is as shown in Table 5.

The length of stay in the park correlates negatively to pleasantness of the park in both KLCC Park and Putrajaya Botanical Garden (Table 6). This suggests that as park visitors become more aware of their surroundings, the perceived pleasantness decreases. The positive significant correlation in KLCC Park and Putrajaya Botanical Garden can be attributed to the characteristics of the parks. KLCC Park is in a busy urban setting, where being in the park for a longer period of time

Table 5

Correlation between soundscape and perceived subjective wellbeing after park visitation

		Perceived affective quality		Sound environment	
		Pleasantness *(rs value)*	Eventfulness *(rs value)*	LAeq, mean *(rs value)*	Perceived loudness *(rs value)*
Stress level	KLCC Park	.260**	-.142	-.102	-.178
	Taman Tasik Permaisuri	.014	-.008	.027	.000
	Bukit Jalil Recreational Park	.184	-.071	.039	.110
	Putrajaya Botanical Garden	.034	.072	-.032	-.132
Happiness level	KLCC Park	.209*	.024	.044	-.074
	Taman Tasik Permaisuri	.191	.115	.040	.085
	Bukit Jalil Recreational Park	.089	-.080	.059	.021
	Putrajaya Botanical Garden	.167	-.049	-.090	-.106
Satisfaction level	KLCC Park	.296**	-.067	-.194*	-.214*
	Taman Tasik Permaisuri	.206*	.050	.052	.030
	Bukit Jalil Recreational Park	.166	.047	.036	.138
	Putrajaya Botanical Garden	.020	-.009	-.098	-.218*
Subjective wellbeing	KLCC Park	.281**	-.025	-.093	-.168
	Taman Tasik Permaisuri	.211*	.084	.046	.063
	Bukit Jalil Recreational Park	.149	-.036	.004	.064
	Putrajaya Botanical Garden	.110	-.041	-.123	-.157

Note. *p<.05; **p<.01

Table 6
Relationship between soundscape perception, perceived emotional effect and length of time spent in the parks

		Time spent in the park
Pleasantness	KLCC Park	-.261**
	Taman Tasik Permaisuri	.020
	Bukit Jalil Recreational Park	-.053
	Putrajaya Botanical Garden	-.203*
Eventfulness	KLCC Park	.072
	Taman Tasik Permaisuri	-.033
	Bukit Jalil Recreational Park	.168
	Putrajaya Botanical Garden	.281**

Note. *p<.05; **p<.01

allows people to take notice of the park's surrounding. In Putrajaya Botanical Garden, which is rich in park events and gatherings, spending more time in the park makes it less enjoyable. Eventfulness also increases with time spent in Putrajaya Botanical Garden as individuals hear nearby activities and events in the park.

Perceived Sound Sources and Subjective Well-being. Spearman's rho correlation was carried out to investigate the relationship between the perceived dominance of sound sources with the effects of the subjective well-being of the park users after park visitation (Table 7). When correlated with the perceived dominance of sound sources in the parks, the increase in satisfaction level of the park respondents after park visitations showed a difference in the categories of the sound source.

Traffic noises negatively correlate with satisfaction levels across all four parks, where three selected parks showed a significant correlation. Natural sound is only positively correlated with satisfaction

level in KLCC Park with $r_s = .184$, $p < 0.05$, indicating that more natural sounds can lead to higher satisfaction levels after park visitation, especially in a park with busy urban settings. It agrees with Moscoso et al. (2018) and Buxton et al. (2021), who believe natural sounds enhance well-being, improve health, increase the positive effect, and lower stress and annoyance. While sounds from human activities are negatively correlated in Taman Tasik Permaisuri and Putrajaya Botanical Garden ($r_s = -.248$, $p < 0.01$; $r_s = -.252$, $p < 0.05$), it is positively correlated with Bukit Jalil Recreational Park ($r_s = .267$, $p < 0.01$). It indicates that the park respondents prefer the quiet environment in these two parks, as opposed to Bukit Jalil Recreational Park, where the respondents feel more satisfied with the variety of activities in the park. However, the sounds from human activities demonstrated a significant negative correlation with happiness levels in Bukit Jalil Recreational Park ($r_s = -.210$, $p < 0.05$), suggesting that although they are satisfied with the options of activities in the park, the happiness level of the park respondents

Table 7
Relationship between perceived emotional effects and sound sources

	Sound Source	Traffic Noise (rs value)	Other Noise (rs value)	Sounds from Human activities (rs value)	Natural Sounds (rs value)
Stress Level	KLCC Park	-.312**	-.170	-.227*	.164
	Taman Tasik Permaisuri	-.053	.020	-.147	.00
	Bukit Jalil Recreational Park	-.172	-.142	-.194	.780
	Putrajaya Botanical Garden	-.126	-.116	-.084	.026
Happiness Level	KLCC Park	-.063	.024	-.156	.032
	Taman Tasik Permaisuri	-.124	.052	-.063	.065
	Bukit Jalil Recreational Park	-.187	-.064	-.210*	-.075
	Putrajaya Botanical Garden	-.164	-.029	-.119	.024
Satisfaction Level	KLCC Park	-.295**	-.125	-.172	.184*
	Taman Tasik Permaisuri	-.182	.159	-.248*	.116
	Bukit Jalil Recreational Park	-.221*	.006	0.267**	-.038
	Putrajaya Botanical Garden	-.306**	.085	-.252*	.013
Subjective Wellbeing	KLCC Park	-.226*	-.072	-.198*	.123
	Taman Tasik Permaisuri	-.179	.106	-.166	.103
	Bukit Jalil Recreational Park	-.225*	-.053	-.276**	-.074
	Putrajaya Botanical Garden	-.237*	-.003	-.198*	-.026

Note. *p<.05; **p<.01

decrease when the sounds from the human activities become too loud.

DISCUSSION

The study's results revealed that the park's soundscape and environment affect the subjective well-being of the park users. It is significant for urban planners and landscape architects who want to create better spaces for restoration and leisure.

Soundscape Perception in Malaysia

Based on the questionnaire survey and statistical analysis of the four parks in Malaysia, the perceived soundscape and sound sources were shown. The soundscape perception in Malaysia is explained by Eventfulness (Factor 1) 40.1% and Pleasantness (Factor 2) 33.4%, which is similar to the results of soundscape perception in Eastern countries like China and Korea (Deng et al., 2020; Joen et al., 2015). It shows that the perception of soundscape differs according to the cultural differences between the different countries; soundscapes in western countries are dominated by Eventfulness (Factor 2) (Axelsson et al., 2010; Deng et al., 2020). It also signifies that communities in Malaysia value the eventfulness of a park above its pleasantness, with people more eager to visit the park for sports or leisure activities compared to Western recreational cultures of being in the park for picnics and relaxation purposes.

Soundscape, Sound Environment and Perceived Emotional Effects

Similar findings were observed in other research (Ojala et al., 2019; Wang et al., 2020; Zhang et al., 2017), where urban parks positively impact people's well-being and quality of life. This study has demonstrated the park's soundscape's positive effects in decreasing stress and increasing happiness and satisfaction after park visitations. Although in this study, only the increase in satisfaction level after park visitation resulted in statistical significance, it is clear that the pleasantness of the park's soundscape is positively correlated with the increase in subjective well-being from the park visitation. The findings of research from Herranz-Pascual et al. (2019) highlighted that pleasantness, calm, fun, and naturalness are soundscape characteristics which lead to emotional restoration and a reduction in perceived stress.

The research findings also suggested that objective measurements may not significantly predict subjective well-being effects from park visitations. Only KLCC Park showed a significant negative correlation with the park users' satisfaction, indicating that lower sound levels in an urban park may result in higher subjective well-being. It agrees with findings suggesting that urban noise levels exceeding 55dB can result in negative public health outcomes (Counts & Newman, 2019). Results of the research also demonstrate that expectation of the sound levels of parks may influence the satisfaction level of the park users after park visitation. Perceived loudness also correlates negatively with subjective well-being, indicating that the increase in loudness which exceeds the expectations of the park users, influences the purpose and outcome of the visit. The dominance of sounds in the park has also proved to complement the users' purpose of visiting.

The dominance of sound sources is also said to influence the perceived effects on subjective well-being and the reduction of stress of park visitors. In this research, natural sounds positively correlate with the satisfaction level of park visitors in KLCC Park, indicating that more natural sounds in urban parks can increase well-being after visitations. It agrees with previous studies that natural sounds promote health, boost positive affect, and reduce stress and annoyance (Buxton et al., 2021). According to the theories Attention Restoration Theory and Stress Recovery Theory, there is a clear relationship between the park's naturalness and restorative capabilities. On the other hand, for quieter parks, sounds from human activities correlate negatively with satisfaction levels as they disrupt the calmness and tranquillity of the park experience. Previous research on the soundscape quality in urban parks revealed that the sound environment could enhance human-environment interactions and the users' experience in the park (Guo, 2019).

CONCLUSION

The interrelationship between sound sources, acoustic environment, soundscapes, and perceived emotional effects were investigated in this study. The findings

of this research add to the theoretical implications on the context of study for the socio-cultural context and demography of Malaysia. Agreeing to Aburawis and Dokmeci Yorukonglu (2018), soundscape perception is dependent on the experience and context of the space, through the characterisation by sound environment and by perceived affective quality of the soundscape. This study demonstrated that although the parks in Malaysia are composed of similar sound types where natural sounds dominate the soundscape, followed by sounds from human activities, the perceived soundscape of the parks varies. The soundscape perception of Malaysia also reflects how other Asian countries perceive soundscape, along with similar purposes of visits to parks. A quieter environment has higher values of pleasantness, highlighting the importance of tranquillity in such parks. All selected parks reflected an exciting soundscape with high levels of pleasantness and eventfulness. As Malaysia is in the tropical region, findings of this study demonstrated the perception of the park users relating to the auditory environment with similar sound source dominance throughout the year. It provides an understanding on how people perceived the sounds in the parks and the implications of the soundscape on people's subjective well-being when the soundscape does not change drastically over the four-seasons as present in temperate regions.

Regarding the effects of subjective well-being and stress reduction from the perceived soundscapes, the study identified that the soundscape of a park contributes to positive effects such as decreased stress, increased happiness, and satisfaction. Sound levels and perceived loudness also correlates with the increase in subjective well-being from park visits. These findings support the previously established advantages of improving natural components in urban areas and boosting the variety of birds and water sounds (Herranz-Pascual et al., 2019). It is also clear that traffic noises significantly affect the emotional effects of the park visitors. Findings revealed that sounds from human activities contribute to the eventfulness of the parks, making the parks exciting and improving the well-being of park users in Malaysia. However, these results differ to the study by Guo et al. (2023) on soundscape perception and park restorative benefits. The relationship between soundscape perception and subjective well-being in the selected study area suggested a weaker relationship between people-place interaction for the auditory experience. This may be due to the lack of awareness of the sound environment and eventful activities in the parks. Therefore, further emphasis should be undertaken on the concept of soundscape in parks to enhance the park environment in Malaysia. This leads to the implications for planning and designing of a park environment based on the findings of the study. This research strengthens the need for consideration of the preferences of sounds people hear in the park and strongly justifies the need in creating parks of supportive soundscapes to promote the subjective

well-being of the park users. Further studies could focus on exploring the visual effects of park landscapes together with soundscapes, as well as concentrating on the effects of soundscapes on communities sensitive to noises.

Limitation and Scope for Future Studies

One of the limitations of the study is related to the participants' behaviour during the interview. One constraint both interview and semantic scaling have is that they require the participant's awareness and attention to the acoustic environment (Aletta et al., 2016). Requesting the participant's attention to the acoustic environment during the interview may not reflect the result of a subconscious hearing in the park. It may influence how they perceive the sound environment as it is somewhat atypical compared to everyday life. Therefore, the researcher may consider using behavioural observation to deal with this limitation so that the participants are oblivious to the study and do not affect the results.

Another limitation of the study is related to the noise sensitivity of park users. Other than in KLCC Park, most of the park users were not sensitive to noise, which may restrict the generalizability of the results to park users who are sensitive to noises since various researchers have demonstrated that subjective responses to soundscape may differ among individuals (Aletta et al., 2018). Therefore, further studies should be conducted to focus on the effect of soundscape on individuals who are sensitive to noises in parks.

Furthermore, several studies have suggested that visuals (Echevarria Sanchez et al., 2017; Hong & Jeon, 2013; Maffei et al., 2016) may be an important indicator in describing park soundscapes. As a result, future studies could further investigate the relationships between soundscape and visual indicators in urban parks to demonstrate a better relationship between the park environment and the emotional effects of the visitation. Smaller parks in high density cities can have distinctive soundscapes due to their dense population (Zhang et al., 2019). Neighbourhood parks' soundscape can vary based on natural and anthropogenic sounds, and the location of the park. As this research focuses on the urban parks, further studies can analyse the soundscape of parks with different hierarchies such as neighbourhood parks and regional parks to improve the park environment for the benefit of the communities.

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The Effect of the RADEC Model on Conceptual Understanding of Polycyclic Aromatic Hydrocarbons (PAHs) Topic

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ABSTRACT

This study was conducted to analyze the conceptual understanding of students and their struggle on Polycyclic Aromatic Hydrocarbons (PAHs) compounds topic through the implementation of the RADEC Model. Respondents consisted of 37 students from Chemistry Education Department and 33 students from the Chemistry Department at a university in Bandung, Indonesia. This study is an experimental study with a pre-experimental type. Data on conceptual understanding were obtained through pre-tests and post-tests, while data on students' difficulties were obtained through survey. The data were analyzed using SPSS 24. It was found that there was an increase in the conceptual understanding of the students of Chemistry Education and Chemistry Department in the medium category with n-gain values of 0.33 and 0.38, respectively. The results of inferential analysis through the Wilcoxon Test with Asymp. Sig. (2-tailed) were <0.05 for the two groups of students indicating differences in the pre-test and post-test results with a higher average post-test score. Friedel-Crafts acylation is a concept that is difficult to understand by students from the Chemistry Education Department and the Chemistry Department with the same percentage of 33%. Chemistry Department students also have difficulty understanding the electrophilic substitution concept with a percentage of 33%. As a practical implication, this study successfully showed the effective implementation of the RADEC model, serving as an innovative and beneficial learning approach. The model offered substantial support to students in grasping complex topic such as PAHs compounds.

Keywords: Conceptual understanding, difficulty analysis, PAHs topic, RADEC model

INTRODUCTION

Learning organic chemistry is considered challenging for students and the biggest issue is the topic involving many structures and reaction mechanisms (Crucho et al., 2020; Durmaz, 2018). Students felt struggle to understand organic chemistry because all topics are conveyed during classroom sessions through the traditional lecture method (Garg, 2019). Studies showed that low performance in chemistry was associated with negative attitudes toward ineffective instructional techniques (Musengimana et al., 2021). Students did not like chemistry because lecturers often used the traditional lecture method when solving problems on the board. Studies showed that 65% of students had low interest in organic chemistry at the beginning of each semester (Garg, 2019). Polycyclic Aromatic Hydrocarbons (PAHs) compounds topic was full of organic chemistry concepts which must be understood. PAHs are characterized by rings that share carbon atoms and a common aromatic pi electron cloud (Fessenden & Fessenden, 1986), such as naphthalene or camphor. Naphthalene is often used as a deodorizer, antiseptic, and moth repellent (Chen et al., 2018). The example of naphthalene or camphor can be seen in Figure 1.

Studies have reported that the topic of PAHs is difficult for students to understand because it consists of concepts related to resonance or electron delocalization (Carle & Flynn, 2020; Duis, 2011). Electron delocalization occurs in the benzene ring. This is the main aspect causing the reactivity of the benzene ring (Solomon & Fryhle, 2011). The concept of resonance is difficult to understand because students must be able to describe several resonance structures and electron flow. Carle et al. (2020) reported that many studies have revealed some students' misconceptions about resonance, such as the change in resonance structures and the perception that resonance structures exist as an equilibrium. Nartey and Hanson (2021) state that students need better performance in organic chemistry. Based on their survey, an organic compound with a ring structure, such as benzene and PAHs, was the hard topic to teach.
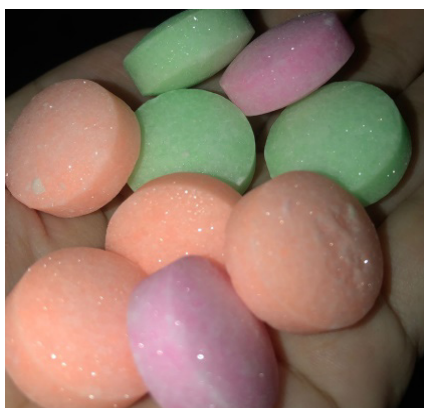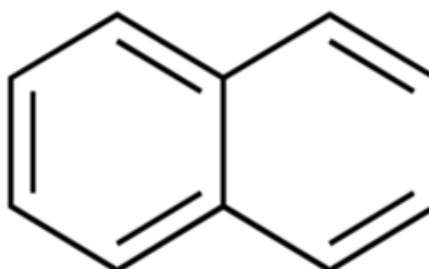
Figure 1. (a) Camphor (naphthalene); (b) The structure of naphthalene

Students' conceptual understanding should be built during the learning process because students who do not go through it find it difficult to understand what they are learning. Students' ability to understand the concepts on the topic of PAHs compounds referred to in this study includes the competence to remember, understand, apply, analyze, evaluate and create. These competences are parts of the dimensions of cognitive processes that can be assessed based on the Revised Bloom's Taxonomy (Anderson & Krathwohl, 2001).

Conceptual understanding is a complex activity that includes understanding simple scientific concepts and refers to students' competence to apply and relate these concepts to scientific phenomena in a meaningful way (Schwedler & Kaldewey, 2020). Therefore, conceptual understanding is one of the best predictors of academic success. Unfortunately, even students in higher education still struggle to understand basic concepts (Jeongho et al., 2017; Schwedler & Kaldewey, 2020). According to Sozbilir (2004), students tend to want university teaching to focus more on their conceptual understanding.

To help students achieve conceptual understanding regarding the topic of PAHs compounds, it is necessary to improve the quality of learning through the application of learning models with stages that are easy to memorize, understand, and to apply, as well as suitable with the situation and conditions of the COVID-19 pandemic. Students' competence to understand concepts can be obtained through the lecture process (Anderson & Krathwohl, 2001). One model that can be an alternative to improve students' conceptual understanding is the RADEC Model. RADEC is an abbreviation of the learning stages in this model, namely Read, Answer, Discuss, Explain, and Create. This model was first introduced by Sopandi (2017) at an international seminar in Malaysia.

The application of the RADEC Model is suitable for the learning context in Indonesia (Pratama et al., 2019) and in the conditions of the COVID-19 pandemic (Lestari et al., 2021). The number of people who carry out activities using the Internet is increasing on an annual basis. In 2019, the number of users was around 64.8% of the total population of Indonesia. Lecturers should use this phenomenon to improve the quality of learning because students are familiar to use ICT tools (Farrell & Hamed, 2017). The RADEC model has high flexibility to be integrated into face-to-face, blended, and full online learning (Sukardi et al., 2021). In the conditions of the COVID-19 pandemic, learning through the RADEC model can be carried out by searching for information through Google, distributing pre-learning questions using Google Classroom, discussing through Zoom, and creating projects at home.

RADEC Model facilitates the development of knowledge in the form of conceptual understanding because, at the Read stage, students can explore the concepts that serve as the learning materials. If this stage does not facilitate the students, peers and lecturers must

provide explanations to increase conceptual understanding at the Discuss and Explain stages. The development of attitudes is illustrated through interactions with teachers and among students in the Discuss, Explain, and Create stages. The teacher becomes a facilitator in discussions and peer-teaching among students. Students who have understood the concept through the Read stage are obliged to give explanations to students who do not understand the concepts. The students' skills are illustrated through the Read stage, which can improve reading skills. The Answer stage can improve writing skills, the Discuss and Explain stages can enhance cooperation and speaking skills, while the Create stage can improve project design skills (Handayani et al., 2019; Sopandi et al., 2021).

The RADEC model can improve conceptual understanding of concept-laden learning topic (Ma'ruf et al., 2020; Rohmawatiningsih et al., 2021; Siregar et al., 2020; Sujana et al., 2021). However, this study is conducted on school students, and there is no analysis on the application of the model at the university level on topics related to PAHs compounds. Judging from the characteristics of the RADEC Model, which requires students to explore information from various literature on their own, it is the concept of active learning that students must do. If the literature search for students is limited to school books, teaching materials from teachers, and Google, then a more comprehensive literature search can lead to the advancement of knowledge available in Scopus, Web of Science, Google Scholar,

ERIC, and others. The effect of applying the RADEC model on students' conceptual understanding of the topic of PAHs has not been studied. Therefore, this can be the novelty of this research. In addition to conceptual understanding, this study also analyzes students' struggle in understanding the topic of PAHs compounds through the application of RADEC Model, especially at the Read stage. This is necessary because students are unfamiliar with learning methods that apply the RADEC Model, and we need to know what difficulties the students face. Based on this background, the following research questions were formulated:

i. What are the conceptual understanding of students on PAHs topic before and after the application of the RADEC model?
ii. What are the struggles of students on understanding PAHs topic, specifically in the Read stage?

MATERIALS AND METHODS

Study Design

This experimental study was conducted using pre-experimental type. The design used was the One-Group Pretest-Posttest Design (Creswell & Creswell, 2018) and the subjects were students taking their fifth-semester courses at a university in Bandung. The students were from the Chemistry Education Department and the Chemistry Department. Both departments have obtained Indonesian National Accreditation in the Very Good category. Respondents consisted of 37 students from Chemistry

Education Department and 33 students from the Chemistry Department who took the Structure and Reactivity of Polyfunctional Organic Compounds Course at a university in Bandung, Indonesia.

Course Information

PAHs topic is part of the topics in organic chemistry course. The detailed information of the course can be seen in Table 1.

Table 1
The information of PAHs topic in organic chemistry course

	Information
Department	Chemistry Education Department and the Chemistry Department
Course Title	Structure and Reactivity of Polyfunctional Organic Compounds
Course Prerequisite	Structure and Reactivity of Monofunctional Organic Compounds
Course Schedule	Every Thursday (7:00 AM and 8:40 AM)
Credit Course	2 (two) credits (2 x 50 minutes)
Course Objectives	In PAHs topic, the course objectives are as follows: i. Identifying the PAHs compounds and determining nomenclature & criteria for PAHs. ii. Analyzing the reactivity of PAHs. iii. Drawing electrophilic substitution reactions for PAHs. iv. Drawing sulfonation reactions of naphthalene. v. Drawing Friedel-Craft acylation reaction. vi. Predicting the effect of bound groups (activating groups and deactivating groups) on PAHs compounds.
Media, Text, and Resource Requirements	Bifunctional Compounds (Ward, 1994), Organic Chemistry (Fessenden & Fessenden, 1986), Organic Chemistry (Solomon & Fryhle, 2011)

Treatment

The course was carried out during the COVID-19 pandemic, so the application of the RADEC Model and the collection of research data were carried out online. The course that applied the RADEC Model were carried out via the Zoom Meeting platform, while the pre-learning questions and teaching materials were distributed through the university's Learning Management System, called SPOT (*Sistem Pembelajaran Online Terpadu*). The stages of RADEC model in the course that implemented it are presented in Table 2.

Table 2
The stages of the RADEC Model in organic chemistry course

Pre-learning Activities	
Read	Students read information from various literature and teaching materials on the topic of PAHs based on the directions provided on SPOT.

Table 2 *(Continue)*

Pre-learning Activities	
Answer	Students answer the pre-learning questions available on SPOT. The questions are based on the information obtained at the Read stage.

Preliminary Activities
i. Lecturer opens lecture activities. ii. Lecturer starts the class by reviewing the material previously learned and then showing pictures related to the PAHs topic. iii. Lecturer inform students the learning objectives.

Main Activities	
Discuss	i. Students discuss the answers to pre-learning questions and cases that become the subject of study. ii. Lecturer identifies part of the task most students struggle with, and then explain the particular section at the Explain stage.
Explain	i. Students explain their work by using the share-screen and annotate features. Other students give questions or responses. ii. Answering questions from the lecturer. iii. Listening to the explanation from lecturer. iv. Lecturer ensures that the students' explanation is scientifically correct. v. This stage can also be conducted by showing videos, doing simulations, and making demonstrations.
Create	i. Lecturer facilitates students to discuss the implementation of project ideas. ii. Students design projects based on ideas that have been proposed and agreed upon, and also the knowledge that has been gained in learning activities.

Closing Activities
Students and lecturer make conclusions and reflections together. Then, the lecturer provides students with encouragement and moral messages to keep the spirit of learning, inform the material for the upcoming meeting, and ends the class with a prayer.
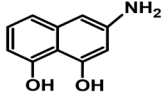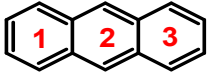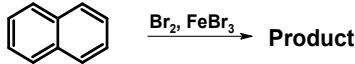
Data Collection and Analysis

Research data collection, namely pre-test and post-test data, was carried out through Quizizz platform. The pre-test was given at the beginning of the course, while the post-test was given at the end. The pre-test and post-test questions were taken from a question bank owned by a team of organic chemistry lecturers in the university. Some examples of pre-test and post-test questions are presented in Table 3. In addition, to find out students' difficulties in understanding the topic of PAHs through reading activities, the researchers conducted a reading survey through an open questionnaire containing questions about difficult-to-understand course materials.

The analysis of quantitative data namely the pre-test and post-test to determine the effect of the implementation of the RADEC

Table 3
Some examples of pre-test and post-test questions

No.	Pre-test and Post-test Question	Topic	Cognitive Level
1.	Determine the name of this PAHs compound structure based on IUPAC!	Nomenclature of PAHs	Applying (C3)
2.	What number is the position of reactivity of anthracene on the benzene ring?	The reactivity of PAHs	Analyzing (C4)
3.	Determine the product that is potentially formed in the following reaction:	Electrophilic substitution reactions for PAHs	Creating (C6)

Model on conceptual understanding was conducted using normalized gain/n-gain ($<g>$) from Hake (1998). The n-gain interpretation is presented in Table 4.

Moreover, the differences in conceptual understanding of students before and after the course were analyzed using a Wilcoxon Test. Wilcoxon Test is used to determine the difference between the average of the pre-test and post-test scores. The analysis of the data was conducted using nonparametric test because, after the normality test using SPSS, it was found out that the data used in this study were not normally distributed.

Table 4
n-gain interpretation

Category	Limitation
High	$<g> > .7$
Medium	$.3 \leq <g> \leq .7$
Low	$<g> < .3$

The results of the normality test can be seen in Table 5.

Based on the number of respondents in each class, which was less than 50 students, the normality test used was the Shapiro-Wilk Test. The test results of both classes show the value of Sig. <0.05, so it can be

Table 5
Test of normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	*df*	Sig.	Statistic	*df*	Sig.
Chemistry Education	.378	36	.000	.853	36	.000
Chemistry	.259	32	.000	.722	32	.000

Note. df = degrees of freedom (Total respondent – 1); Sig. = significance.

interpreted that the data is not normally distributed. The statistical hypothesis for the different tests is that "there is a significant difference between the average pre-test and post-test scores of students in course on the topic of PAHs."

The results of the reading survey were analyzed descriptively and the analysis stage started with tabulating the answers about difficult-to-understand lecture materials into several groups. Furthermore, the number of students experiencing difficulties with the lecture materials was converted into a percentage (%). For qualitative data, the collection was carried out through observation and lecture recordings. According to Creswell and Creswell (2018), qualitative data was used to support quantitative data. Based on the observation and lecture recordings, the data were analyzed descriptively. This analysis was useful in designing detailed descriptions for classroom situations through the implementation of the RADEC model.

Threats

The RADEC model can serve as an innovative learning model that helps students understand a complex topic such as PAHs compounds. The internal threat from practical implementation using the model includes the readiness of students. According to Hung (2016), readiness is indeed an important issue in teaching and learning. Furthermore, when using the model, students must give extra time and effort to answer the pre-learning questions before the course meeting. In this study,

the pre-learning questions were developed to accommodate cognitive processes in line with Revised Bloom Taxonomy. To minimize this threat, lecturers motivate students to read information from various literature and teaching materials. These help students gain information in answering the pre-learning questions easily in under five days. On the Read stage, students search and read information from various literature on PAHs topic. To avoid confusion among students on the details of the topic read at home and facilitate them to search the information from various literature, lecturers provided directions on SPOT. Attention must be given to compatibility between the pre-test and post-test questions which assessed conceptual understanding with the learning goals. To reach the compatibility between the questions discussion should be conducted with lecturers before the courses are held.

The external threat from practical implementation using the RADEC model included (i) the course was carried out online because the application and the collection of data were carried out during the COVID-19 pandemic. Extra attention was provided to the course carried out through the Zoom Meeting platform, while the pre-learning questions and teaching materials were distributed through the Learning Management System, called SPOT; (ii) The internet network availability of students was an external threat in this study. To overcome this threat, lecturers were always brief and reminded students to prepare and check the internet network availability before course

meetings; (iii) The study subjects were students from two different departments and their accreditation level was important. To gain the information on accreditation level, the certificate from Indonesian National Accreditation Institution was emphasized and the departments obtained Indonesian National Accreditation in the Very Good category.

RESULTS AND DISCUSSIONS

Results

Conceptual Understanding of Students. In the PAHs compound course, six topics were discussed, namely, (i) introduction, nomenclature, and criteria for PAHs, (ii) the reactivity of PAHs, (iii) electrophilic substitution reactions for PAHs, (iv) sulfonation reactions of naphthalene, (v) Friedel Craft acylation reaction, and (vi) the effect of bound groups (activating groups and deactivating groups) on PAHs compounds. The average pre-test and post-test scores of Chemistry Education Department and the Chemistry Department are presented in Figure 2.

Based on the research results presented in Figure 2, it can be seen that the students from the Chemistry Education Department and Chemistry Department have an average post-test score that is higher than the average pre-test score on the topic of PAHs compound with the implementation of the RADEC Model. Most questions that were answered correctly in the pre-test and post-test were about the introduction of PAH compounds, terminology, and criteria. Meanwhile, the topic of electrophilic substitution reactions was the topic that students from both Departments answered incorrectly. Based on the average score, the n-gain score obtained from the two groups of students is 0.33 for Chemistry Education Department students and 0.38 for Chemistry Department students.

Analysis of pre-test and post-test data using the n-gain formula aims to determine the effectiveness of the implementation of the RADEC Model on students' conceptual understanding. The results of the Wilcoxon Test can be seen in the Table 6. Table 6 shows Asymp. Sig. (2-tailed) < 0.05 for both groups of students. Based on this, it can be interpreted that the statistical hypothesis is accepted, or there is a significant difference
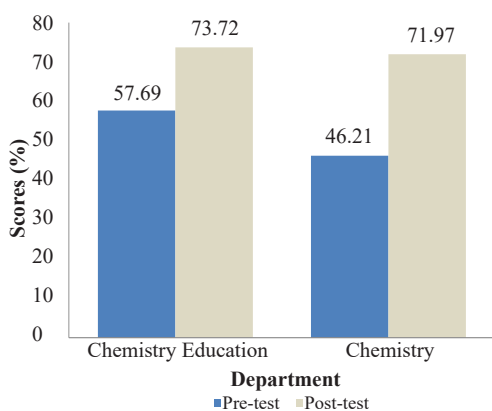
Figure 2. The average pre-test and post-test scores

Table 6
The results of the Wilcoxon Test

Test Statistics	Chemistry Education	Chemistry
Z	-3.929	-3.784
Asymp. Sig. (2-tailed)	0.000	0.000

between students' average pre-test and post-test scores on the topic of PAHs.

Struggle of Students. Data on the struggle of students to understand topic are presented in Figure 3. Based on the data in Figure 3, it can be seen that Topic 5, the Friedel Craft acylation reaction, is the most difficult topic for students from both departments to understand. This result is not in line with the frequency of questions that students answered incorrectly,

that is Topic 3 (electrophilic substitution reactions for PAHs). Although Friedel Craft's acylation reaction is considered a complex topic for many students, the facts show that they can solve the problems about the topic. The topic that gets the lowest percentage in the questionnaires is Topic 2 (Reactivity Position of PAHs) for Chemistry Education Department students and Topic 4 (Naphthalene Sulfonation Reaction) for Chemistry Department students.
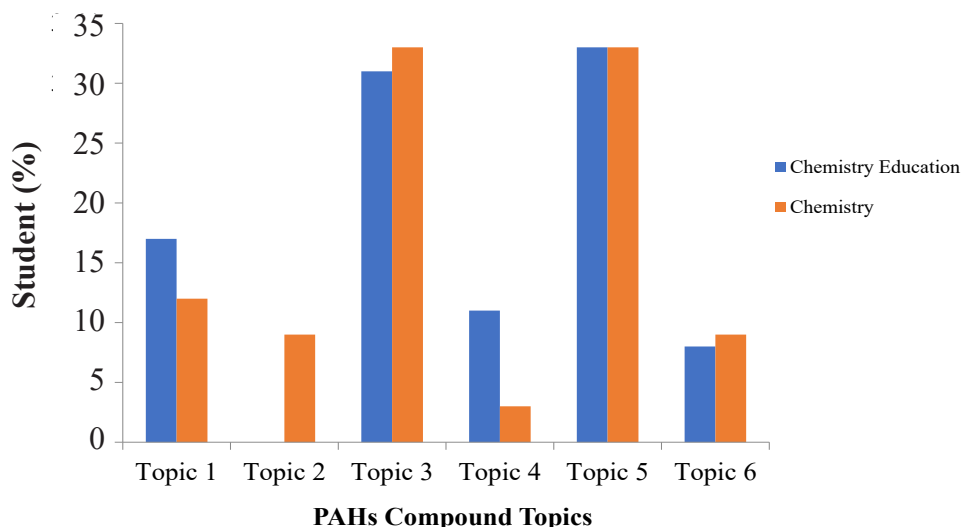
Figure 3. The percentages of students struggle on PAHs compound topics

Note. Topic 1 = introduction, nomenclature, and criteria for PAHs; Topic 2 = the reactivity of PAHs; Topic 3 = electrophilic substitution reactions for PAHs; Topic 4 = sulfonation reactions of naphthalene; Topic 5 = Friedel Craft acylation reaction; Topic 6 = the effect of bound groups (activating groups and deactivating groups) on PAHs compounds.

Discussions

Conceptual Understanding of Students on PAHs Compounds Topic through the Implementation of the RADEC Model. The n-gain scores of the two groups of students are interpreted to be in the medium category based on Hake

(1998). The different test shows a significant difference with the average post-test score higher than the pre-test. The results indicate that the RADEC model effectively improves the conceptual understanding of students in both departments.

The effectiveness of the treatment given to respondents can be proven when the treatment was given to both groups with different learning situations (Sholahuddin et al., 2021). In this study, students from the Chemistry Education Department conducted courses in the morning, while students from the Chemistry Department conducted courses in the afternoon. The increase in students' conceptual knowledge can be identified through the post-test average score, which is higher than the average pre-test score. The pre-test and post-test contained questions that accommodated the competence in the cognitive process dimension. The questions in Topic 1 (introduction, nomenclature, and criteria for PAHs compounds) were the questions most students answered correctly. In contrast, the questions in Topic 3 (electrophilic substitution reactions) were the questions that most students answered incorrectly. However, the number of students who answered incorrectly decreased during the post-test. This result illustrates that the topic's difficulty level affects students' conceptual understanding (Herga et al., 2016).

The effectiveness of the RADEC Model in improving students' conceptual understanding can be seen from the stages of the RADEC Model that can accommodate students' cognitive processes according to the Revised Bloom's Taxonomy. This mental process is an indicator of student conceptual understanding. Based on Weay et al. (2016), Revised Bloom's Taxonomy acts as the cognitive taxonomy that can assess students' achievement and conceptual understanding. The description of the stages of the RADEC model that accommodates the cognitive processes based on the Revised Bloom's Taxonomy is as follows:

Read (R).

At this stage, students actively seek information from relevant sources, and the process of extracting information is guided through pre-learning questions. Pre-learning questions guide students to use the information obtained from the reading activities as essential concepts (Sopandi et al., 2021). To help students understand a topic, teachers must provide crucial questions that can guide students to explore and find basic concepts related to the topic (Sukardi et al., 2021). In this study, the distribution of pre-learning questions was done through SPOT. Incorporating reading activities into the tasks of students was an essential aspect of addressing their requirements for effective learning, given the limited availability of time for both face-to-face and online lectures. Meanwhile, the demands of active learning that can provide feedback for students are essential (Parker & Loudon, 2013).

Answer (A).

At the Read stage, students explore various information based on the directions from the pre-learning questions. Meanwhile, at the Answer stage, students answer the pre-learning questions. The engagement of students in responding to pre-learning questions during the Answer stage facilitates

a self-assessment of their reading habits. This process enables them to determine whether they approach reading with diligence or lethargy, identify any challenges in comprehending the reading material, and ascertain their preferences towards the course material activities (Sopandi et al., 2021). According to Revised Bloom Taxonomy by Anderson and Krathwohl (2001), the Read and Answer stages accommodate all the cognitive processes because the making of the pre-learning questions refers to the cognitive level of the taxonomy. However, students might have different skills and learning styles, as stated in the Multiple Intelligences and Learning Styles concepts. Therefore, the lecturer does not require students to be able to correctly answer all pre-learning questions at the Answer stage. Still, students are given the freedom to respond based on relevant and reliable sources. Some pre-learning questions on the topic of PAHs compounds that were made according to the level of cognitive processes according to Revised Bloom's Taxonomy can be seen in Table 7.

Table 7
Pre-learning questions of PAHs topic based on revised bloom's taxonomy

Pre-learning Questions	Level of Cognitive Process
What is PAHs compound?	Remember (C1)
Explain the classification of polycyclic compounds based on their aromaticity, types of constituent atoms, and ways of joining the rings!	Understand (C2)
Learn the concept of reactivity in PAHs and determine the reactivity of pyrene!	Apply (C3)
Anthracene and phenanthrene are also aromatic compounds because they require aromatic compounds. Prove that statement!	Evaluate (C5)

Discuss (D).

The Discuss stage is filled with group discussions about the results of the students' respective work on pre-learning questions and cases that become the course material. However, in this study, lectures were conducted online, so the discussion activities were carried out through question-and-answer activities among students accommodated by the teacher. Discussions between lectures and students help students achieve better conceptual understanding (Chan et al., 2016). This Discuss stage trains the cognitive processes of students at the analyzing (C4) and evaluating level (C5) in Revised Bloom Taxonomy. At the Discuss stage, lecturers ensure that there is communication among students to obtain the correct answer (Sopandi et al., 2021). Subsequently, the specific section of the assignment was discerned where most students encounter difficulties and proceed to address the portion during the Explain stage.

Explain (E).

Based on the question-and-answer activity at the Discuss stage, lecturers identified parts of PAHs compounds topic yet to be understood by students, or elements in which students still had misconceptions. A misconception is an understanding of a concept that is different from the generally agreed scientific knowledge (Nakhleh, 1992). Finally, at the Explain stage, the lecturer tried to correct the misconceptions about the differences between aromatic and non-aromatic polycyclic compounds that still became a misconception for the students. In the initial process, the teacher gives students the question about the term of aromatic compound. It stimulates students to analyze the concepts of a conjugated double bond, the bond length in the ring structure of PAHs, and the delocalized electrons that create the characteristic of aromatic compound. The lecturer gave guiding questions to students to confirm the misconceptions that occur. Guiding questions act as an assistance from the teacher so that students can understand a phenomenon or solve problems and provide results to improve academic competence (Kapon, 2016). The lecturer provided guiding questions based on the fact that the students claimed to be able to distinguish polycyclic aromatic compounds and non-aromatic polycyclic compounds through the appearance of the compound structure.

However, they were not able to explain the causes that determine the properties of polycyclic aromatic compounds and non-aromatic polycyclic compounds. One of the fundamental sources of learning difficulties and chemical misconceptions is the failure of students to understand the emergent properties of chemical compounds and their interactions (Tümay, 2016).

Create (C).

At this stage, students were asked to make several reactions to PAHs based on the concepts learned from the previous RADEC model stage. These reactions include electrophilic substitution reaction 1, electrophilic substitution reaction 2, naphthalene sulfonation reaction, and Friedel craft acylation reaction. The stage accommodates the Create cognitive level (C6) in Revised Bloom Taxonomy. Creating is uniting the parts to form work or product with a connection between the parts (Anderson & Krathwohl, 2001). In according with the Create cognitive level in Revised Bloom's Taxonomy, the Create stage in the RADEC Model provides an opportunity for students to use the knowledge they have mastered to plan creative ideas (Sopandi et al., 2021). In this study, students were asked to predict the products formed and to make some reaction equations through the concepts learned in writing reaction equations. The supporting concepts include the position of the reactivity of the compound and the bound group. The Create cognitive level in Revised Bloom Taxonomy required organizational and planning skills for products or manufacturing steps (Mansur et al., 2019). This was in line with the Create stage of the RADEC model, which

accommodated students to design projects (Ma'ruf et al., 2020).

RADEC Model has the possibility to apply to other topics or subjects. Ma'ruf et al. (2020) applied the RADEC Model to train students in making natural watercolors. Making natural watercolors was the project that students must conduct on the colloidal topic and another study using the RADEC model was from Sujana et al. (2021). The conceptual understanding of chemical representations was analyzed by making waste filters or chemical products that could absorb waste in the sea by using the RADEC model in the classroom. According to Handayani et al. (2019), the model required students to read, understand, think, and analyze their reading sources by answering the pre-learning questions. In mathematics, it facilitated students in discussing the problem of the formula to count the area of triangles, squares, and circles (Sopandi et al., 2021).

The RADEC model was created to improve the quality of learning processes (Sopandi, 2017). The novelties and uniqueness Model (1) Required students to actively seek information before classroom sessions. Students explored the information from various literature and the process was guided through pre-learning questions. Pre-learning questions acted as "clues of conceptual knowledge" that should be mastered (Sukardi et al., 2021). Students should answer the pre-learning questions after the reading activity and also focus on learning content. This impacted the improvement of conceptual understanding

directly. (2) The development of the model is based on the fact that there was several learning dominated by lecture activities. Meanwhile, interaction in the classroom was dominated by the presentations of lecturers. The implementation of the model enhanced pre-existing knowledge before the classroom sessions. Consequently, during the in-class sessions, students actively participate in sharing and discussing the information acquired beforehand. (3) The model can be viewed as a technology-based learning model, where students learned teaching materials searched on the internet before classroom sessions (Sukardi et al., 2021). In addition, classroom discussions were carried out through the Zoom Meeting platform. (4) The RADEC model was suitable to apply in a blended format considered to be the most effective learning method adopted by higher education institutions (Rasheed et al., 2020). The Read and Answer stages were carried out online while the Discuss and Explain stages were conducted offline in the classroom. Furthermore, the Create stage was performed online or offline depending on the agreement of students in each group.

The Struggle of Students in Understanding PAHs Topic. Information on the struggle of understanding PAHs topic through the application of the RADEC model, specifically at the Read stage, should be analyzed because the implementation in organic chemistry is relatively new. Data were obtained when the course through Zoom Meeting was about to begin, which was after the Read and Answer Stage. At

this time, the students had not received explanations from the teacher, or the opportunity to have discussions with other students. Thus, the knowledge gained was not maximized. Based on Social Constructivist Learning Theory, a person has a zone between competence that can be achieved alone, and competence that can be achieved with the help of others called the Zone of Proximal Development (ZPD). In this zone, learning in class are carried out through the Discuss, Explain, and Create Stages. After getting help from other people, teachers, and peers, students can reach their potential competence (Vygotsky, 1978). Courses activities help students find solutions about the difficult topics they struggle. They act as scaffolding to strengthen students' conceptual understanding and help students achieve the ability to complete assignments smoothly and independently (Wass & Golding, 2014; Xi & Lantolf, 2021).

PAHs compounds topic had a characteristic related to the topic taught in the previous semester, namely benzene. Consequently, students had to recall their memories on benzene, which PAHs topic was more complex than benzene which was only one member of a large number of aromatic compounds (Fessenden & Fessenden, 1986). A more extensive and in-depth discussion of aromatic compounds was on PAHs topic. This was the cause of struggle in studying PAHs from a topic point of view. In addition, electron resonance and delocalization are important topics when discussing compounds with ring structures. It has been reported that resonance is a fundamental concept in organic chemistry and is one of the most difficult concepts to understand (Carle & Flynn, 2020; Duis, 2011). Therefore, teachers need to assess not only the conceptual understanding of their students, but also the difficulty of the material their students will learn (Rusek & Vojíř, 2019). The problem with topics is the reason why many students and adults dislike science, particularly chemistry and physics (Childs et al., 2015).

Several reasons contributed to the struggles experienced by higher education students in understanding organic chemistry concepts relying on memorization as the primary learning method (Garg, 2019; Horowitz et al., 2013). However, it is worth noting that other learning approaches existed beyond pure memorization. The RADEC model provided an effective approach where students learned independently at home by reading before attending classroom sessions. As a result of this pre-learning activity, students acquired a more profound knowledge of the subject matter compared to those who did not engage in prior reading when the teaching-learning process began in the classroom. This approach empowered students to enhance their understanding and actively contribute during classroom discussions (Sopandi & Sutinah, 2016). Another reason is students cannot engage in the learning environment (Shea, 2016) because the traditional lecture method dominates in classrooms and resulting in lack of interaction. This leads to a lack of development of the various skills necessary to live in the 21st century, such as

communication and collaboration. Lack of interaction also makes students feel bored and struggle on understanding the concepts.

The RADEC model has tried to overcome the struggle of students on understanding the concepts through pre-learning questions (Sopandi et al., 2021). The presence of pre-learning questions to overcome organic chemistry concepts is in line with the Guided Reading Questions used by Kennedy (2016). Guided Reading Questions are used to help students focus on the main points and core concepts of the course. These questions form the basis of class discussion and guidance in reading enabling students to become successful readers (Long & Szabo, 2016). Pre-learning questions serve as scaffolding for students to read complex texts successfully. After giving sufficient instruction before the lesson, students can then read the text successfully. Lecturers can also guide students during the reading process (Young, 2018).

CONCLUSION

In conclusion, this study was conducted to show an improvement in the conceptual understanding of students after learning with the RADEC model. This means that RADEC Model's stages effectively accommodate students' cognitive processes on the topic of PAHs compounds. The model supported students in preparing for the complex topic of PAHs compounds by reading the topic first. Meanwhile, unmastered topic was explained through Discuss, Explain, and Create stages. Through scaffolding from lecturers and peers, students were

assisted in achieving increased conceptual understanding. This study also found that the topic of Friedel Craft acylation reactions was the most difficult topic for students from the Chemistry Education Department to understand and the same topic, namely Friedel Craft acylation reactions and the topic of electrophilic substitution reactions of PAHs compounds, was the most difficult topic for students from the Chemistry Department to understand.

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