

Research Article

Cite this article: Alabdulaziz, M. S. (2025). Mathematics Students' Common Mistakes in Master's Theses at Imam Abdulrahman Bin Faisal University (IAU) in the Light of an Analysis of Its Content and Faculty Members' Perspective. *Educational Process: International Journal*, 18, e2025479
<https://doi.org/10.22521/edupij.2025.18.479>

Received May 1, 2025

Accepted August 18, 2025

Keywords: Common mistakes, master thesis, mathematics education, IAU.

Author for correspondence:

Mansour Saleh Alabdulaziz

 dr.malabdulaziz@hotmail.com

 Department of Curriculum and Instruction,
College of Education, Imam Abdulrahman Bin
Faisal University, P.O. Box 2375, Dammam
31451, Saudi Arabia.

Mathematics Students' Common Mistakes in Master Thesis at Imam Abdulrahman Bin Faisal University (IAU) in the Light of an Analysis of Its Content and Faculty Members' Perspective

Mansour Saleh Alabdulaziz 

Abstract

Background/purpose. This study aimed to identify common mistakes made in master's theses on mathematics education by Saudi mathematics students at IAU in Saudi Arabia, as determined through a content analysis, and to compare these with the views of faculty members.

Materials/methods. A descriptive approach (analytical and survey) was employed. The sample consisted of 52 master's theses and 16 faculty members who supervised and discussed mathematics education master's theses. Two tools were used to collect data: a Content Analysis Card and a questionnaire administered to faculty members.

Results. Using content analysis, 71 mistakes were identified: 62 uncommon mistakes, 1 fairly common mistake, and 8 extremely common mistakes (the findings indicate that master students in the field of mathematics find it challenging to write an introduction, literature review, and thesis results and discussion sections). In addition, according to faculty members, there were 63 uncommon mistakes, 1 fairly common mistake, 6 common mistakes and 5 very common mistakes (An intriguing finding is that the very common type of mistake was literature review, and also interestingly shows that mistakes were commonly made with the method section, thesis results and discussion sections). Moreover, the results revealed a statistically significant correlation ($p < 0.05$) between the content analysis of common mistakes in master's theses specializing in mathematics education at IAU and the views of faculty members. It is interesting to note that, based on an analysis of their content and faculty members' perspectives, the most common mistakes in master's theses were found in the "literature review" and "thesis results and discussion" sections.

Conclusion. Based on the findings, several recommendations and suggestions are presented.



OPEN ACCESS

© The Author(s), 2025. This is an Open Access article, distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution, and reproduction, provided the original article is properly cited.

1. Introduction

Worldwide, scientific research is considered essential for progress and development in various fields. Universities carry the primary responsibility for molding excellent researchers at different stages in their career through their research postgraduate programs, which include master's programs.

Researching a master programme is one of the most defining and important aspects of pursuing a Master of Philosophy. This concurs with Huang's (2007) claim that "to the vast majority of students, the dissertation is by far the most challenging piece of academic work" (p. 30). Thus, the thesis is a challenging endeavor that requires skills, aptitude, and determination for successful, timely completion (Nouri et al., 2019).

The master's thesis represents the culmination of the coursework in the program and the master's degree. Hence, paying attention to this, its quality, and the scarcity of mistakes is an extremely important matter. To achieve this, several stages are followed, including approving the topic, supervising the thesis, discussing the work, and awarding the degree upon its completion (Al-Safran, 2020). However, several mistakes continue to recur in master's and doctoral theses, even after they have been discussed. This was confirmed in a qualitative study by Zabihi and Shubar (2017), who investigated the mistakes made by researchers in dissertations within the fields of psychology and education. Identifying numerous mistakes in all parts of scientific theses, Al-Khalili (2012) emphasized that educational research, like other scientific research, is susceptible to several errors, which he attributed to four main sources: the researcher, the research sample, research tools, and measurement conditions.

Researchers have conducted multiple studies on the mistakes in master's and doctoral theses in psychological and educational research. For instance, Afana (2011) investigated common mistakes in educational research designs among postgraduate students, while Hassan (2016) identified the 14 common mistakes made by researchers and discussants in psychological and educational research. Reviewing the literature on this topic, Zabihi and Shubar (2017) compiled a list of common methodological mistakes in educational research. Abdel-Fattah (2011) and Kojak (2007) both conducted a study of common mistakes in the research of postgraduate students and identified a set that were fairly common. Another studies have been conducted in relation to challenges and strategies in writing scientific papers and thesis, including for master students (Benzie & Harper, 2020; Ching Hei & Khemlani, 2015; Defazio et al., 2015; El-Freihat, 2021; Khozaei Ravari & Tan, 2019; Musa & Khamis, 2015; Patterson & Gilkison, 2020; Rahmiati, 2015; Safnil, 2018; Shahsavari & Kourepaz, 2020; Tsoulfas, 2021; Wee & Banister, 2016; Zotzmann & Sheldrake, 2021).

However, previous studies and research papers have focused on master's and doctoral theses in education generally. Additionally, the studies are primarily conducted outside the Kingdom of Saudi Arabia. Therefore, research gaps remain in relation to the subject, place, time, and specialisation. The current research endeavours to bridge some of these gaps.

1.1. Research Questions

1. What are the common mistakes made by Saudi mathematics students in master's theses at IAU according to content analysis?
2. What are the common mistakes made by Saudi mathematics students in their master's theses at IAU, according to their supervisors?
3. What is the relationship between common mistakes in master's theses identified by faculty members and those revealed by content analysis?

1.2. Research Problem

The research problem emerged from a scientific discussion between the researcher and several faculty members in Saudi universities, who hold degrees in mathematics education, regarding the difficulties their students face when writing their theses and the common mistakes in master's theses in Saudi universities. The researcher noticed the recurrence of these mistakes which became so frequent among some students that they became taken for granted. Thus, the researcher began by reviewing the literature on these mistakes and discussing the subject with Saudi students who had graduated from Saudi universities with a focus on mathematics education. He found that there are several widespread mistakes in master's theses, but no Arab and foreign studies appear to have examined this specialization and this sample of students.

The current study also serves as a response to the recommendations of several studies, seminars, meetings, and conferences that have emphasized the importance of investigating common thesis mistakes among master's-level students. For instance, Al-Safran (2020) recommended conducting research on common mistakes in master's theses in Saudi, Arab, and foreign universities, as well as in disciplines other than general curricula and teaching methods. Therefore, the researcher pursued this path to help Saudi master students specialising in mathematics education. This type of research will be particularly beneficial in overcoming the difficulties that Saudi students encounter while writing their thesis, in addition to providing them with more time in which to practice.

1.3. The research Objectives

1. Identifying common mistakes in master's theses by Saudi mathematics students at IAU, as revealed by content analysis and faculty members' views.
2. Determining the differences between the various types of common mistakes in master's theses at IAU, based on content analysis and faculty members' views.

1.4. The Research Importance

The importance of the research lies in the following:

1. Identifying common mistakes in master's theses in mathematics education will help researchers avoid them in the future, leading to an increase in the quality of their theses.
2. Enlightening master's thesis supervisors, graduate studies committees, and those in charge of teaching research methods courses about these mistakes will enable them to help students avoid them in their research theses.
3. Supporting the development of mathematics education courses to help master's students pave the way for further research in this field.

2. Literature Review

2.1. Problems Experienced by Postgraduate Students When Writing the Literature Review and Discussion Section of Their Research

While the ability to write effectively can lead to beneficial academic outcomes (Mousavi & Kashefian-Naeeni, 2011), many students face challenges when attempting to write their thesis. In particular, the majority experience the most difficulties with the section involving the review of the literature (Boote & Beile, 2005; Fergie et al., 2011). As stated by Turner and Bitchener (2008), the process of writing such a review requires a wide variety of analytical and rhetorical skills, in addition to academic writing skills, to be synthesized, and students must understand the concepts of argumentation and critical analysis. This notion has received support from different researchers (e.g., Kafipour et al., 2018). Randolph (2009) claimed that if the review of the literature contains

deficiencies, this can result in all other parts of the thesis also being deficient. Therefore, the literature review section of all studies must be composed effectively to ensure that readers understand and are cognisant of the specific and suitable approach (Lopez, 2014).

Akindele (2008) contended that when evaluating a thesis, examiners form an initial impression of its quality after completing their review of the literature, which constitutes a critical aspect of the thesis. As stated by Mallett (2004), a review of the literature must assess and demonstrates how previous and current works are related, the reason why the research is being conducted, as well as the reasoning behind the selection of specific theories or methodologies for the study. Nevertheless, Randolph (2009) noted that most researchers struggle to consider opposing findings and different interpretations in synthesizing quantitative literature. This highlights the importance of fostering students' critical thinking abilities (Shahsavari et al., 2013; Simpson & Courtney, 2002). When students' critical thinking abilities are promoted, they will be capable of justifying and connecting various ideas and concepts. This is likely due to the fact that when students become competent and familiar with strategies for learning language, particularly those that are cognitive and metacognitive in nature, it promotes deep processing and neurological stimulation (Hamzah et al., 2009).

Given the significance of literature reviews in theses, different classifications for writing these sections have been proposed. Previous researchers, such as Cooper (1989), suggested that literature reviews can be grouped into five categories: focus, goal, perspective, coverage, organization, and audience (p. 2). Kachru (1999) claimed that a primary constituent of a critical review of the literature is an individualised voice, whereas other studies, including that of Stapleton (2002), took a different stance, arguing that the voice should not be regarded as the key aspect of writing a review of the literature. In their opinion, the primary aspects of writing a review are critical thinking, identity, and voice. Boote and Beile (2005) designed a rubric to score literature reviews that comprised five different categories: coverage, synthesis, methodology, significance, and rhetoric. Although it has become a critical factor in evaluating the quality of a literature review, it has certain deficiencies because only quantitative techniques are used when examining a thesis. Additionally, whether the scoring rubric is reliable has not been completely demonstrated. Akindele (2008) subsequently developed guidelines that included six elements: brief descriptions of the relevant works, the relationship between the relevant works and different studies, identification of deficiencies in the previous literature, resolution of disagreements between studies, consideration of distinct viewpoints, and connection to the study purpose.

Regarding the discussion section, the discussion is mainly the section in a research paper that makes the readers understand the exact meaning of the results achieved in a study by exploring the significant points of the research, its implications in different areas of the study, and the improvements that the study can make for future developments. However, it is commonly challenging for researchers to realize what should be covered in the discussion section (Taherdoost, 2022; Safnil, 2018; Rahmiati, 2015; Shahsavari & Kourepaz, 2020; Defazio et al., 2015; Basthomi, 2009; Rahkmawati, 2013).

It is expected that the results or findings presented are corroborated or discussed in relation to existing studies, most of which were highlighted during the literature review stages. It is expected that each finding will be discussed alongside one or two studies with gaps that address the objectives of the current study (Johnson, 2009).

The theory(s) highlighted at the theoretical review stage must also be used in discussing the study findings. The author must clearly demonstrate how the tenets of the theory are useful in linking the study's findings to the gaps it seeks to fill (Corrine, 2016). This can be achieved by briefly incorporating one or two relevant tenets/ provisions of the theory to draw conclusions or observations from the study findings and address knowledge gaps.

3. Methodology

3.1. Research Design

The researcher employed an analytical descriptive approach to analyze master's theses, and a descriptive survey to identify faculty members' opinions about common mistakes in master's theses.

3.2. Research Community

The research community consisted of students majoring in mathematics education at IAU and faculty members from the colleges of education at the same university who supervised master's theses in the same specialization and other related specializations.

3.3. The Research Sample

To assess students' theses, the researcher analyzed 52 master's theses completed between 2016 and 2024 by master's students. The sample was randomly selected. Additionally, questionnaires were received from a total of 20 faculty members.

3.4. Statistical Methods Used in the Research

To process the research data and calculate the psychometric properties of the tools, the following methods were applied: the Cooper equation, Cronbach's Alpha equation, Spearman-Brown formula, frequencies, percentages, and weighted averages.

3.5. Research Procedures

The researcher identified and tallied the mistakes repeated in the master's theses. In addition, based on his experience in supervising and discussing numerous theses, the researcher prepared a list of mistakes that master students sometimes make in educational research. The researcher then held a discussion workshop with faculty members and students to discuss common mistakes in these chapters. This helped in eliciting their opinions and points of view, and after several revisions, yielded a final list of mistakes. The two research tools were then prepared, and their validity and reliability were calculated. Data were collected through the survey and content analysis of the sample. The findings were then used to determine how the research questions and hypotheses were answered, based on which several recommendations and suggestions were made.

3.6. Research Material

1. A list of common mistakes in master's theses majoring in mathematics. This was prepared according to the following:

The researcher identified a set of common mistakes that emerged from a scientific discussion among faculty members at IAU about the mistakes commonly repeated in these master's theses, which had become widespread among students and were often taken for granted. Additionally, this list was compiled based on the researcher's experience in supervising and discussing numerous theses, as well as their work on the Postgraduate Studies Committee and the Scientific Research and Publication Committee of the Department of Curricula and Teaching Methods over the past six years. Having collected a list that included (100) mistakes, the researcher then presented it to 7 faculty members in IAU specialising in mathematics, whose feedback encouraged the researcher to return to numerous educational research books and studies on this subject to verify them (e.g. Boote & Beile, 2005; Kojak, 2007; Randolph, 2009; Chinese, 2010; Notar & Cole, 2010; Al-Askar, 2011; Afana, 2011; Kayed, & Adass, 2012; Abbas et al., 2014; Zabihi & Shubar, 2017). Following this review, the researcher added, deleted, and rephrased some statements. For example, four of the arbitrators suggested evaluating the literature review section based on Akindele's (2008) guidelines. Consequently, the researcher changed all the common mistakes in number (11) in the list presented

in the table below, and added Akindele's (2008) guidelines for analysing students' literature reviews, yielding the final list of (69) mistakes detailed in Table 1:

Table 1. List of Common Mistakes in Master's Theses

Thesis elements	Common mistakes
1. The thesis title	1.1. Contains abbreviations 1.2. Titles have more than twenty words
2. Thesis introduction	2.1. The introduction is too long. 2.2. The paragraphs are too long. 2.3. The researcher does not move from the general to the particular. 2.4. Includes old references. 2.5. There is no linkage between paragraphs (surprising the reader).
3. Thesis problem	3.1. Depends on the opinion of the researcher; there is no scientific justification for the study. 3.2. ambiguously formulating the thesis problem. 3.3. Rushed, superficial, and not sticking to a specific idea.
4. Thesis questions	4.1. The questions do not relate to the thesis problem. 4.2. Inclusion of unanswered questions. 4.3. Formulating complex questions.
5. Thesis objectives	5.1. Confusing the objectives with the importance. 5.2. The objectives are not related to the thesis problem. 5.3. The objectives are not related to the thesis questions. 5.4. Exaggeration in writing the objectives of the thesis.
6. Thesis importance	6.1. Judging that the thesis is the first of its kind without making sure to refer to the electronic database rules. 6.2. Confusion between the importance of the thesis and its objectives. 6.3. Confusion between the importance of the thesis and the reasons for choosing a thesis problem.
7. Thesis hypotheses, if any	7.1. Formulating them even when not needed. 7.2. Not specifying their significance. 7.3. They do not explain the relationship between the thesis variables. 7.4. Positing several hypotheses that do not fit the thesis questions.
8. Thesis limits	8.1. There is no justification for choosing these limits over others. 8.2. The researcher does not specify the objective limits precisely. 8.3. The researcher does not specify time limits.

Thesis elements	Common mistakes
9. Thesis terms and variables	9.1. The thesis terms do not include the variables. 9.2. Quoting definitions that do not correspond to the definition of the procedural researcher. 9.3. Expanding the definition of thesis terms by more than two definitions. 9.4. Defining terms without citation. 9.5. Relying on sub-studies in defining terms. 9.6. Lack of connection between procedural definition and thesis procedures and tools.
10. Theoretical framework	10.1. Writing titles that are not directly related to the thesis topic. 10.2. Balance not achieved in the amount written about the variables. 10.3. Thesis concepts are not standardized; for example, they refer to both students and pupils. 10.4. The researcher's personality is not clearly visible in the theoretical framework. 10.5. Insufficient number and lack of variety of information sources. 10.6. Failure to observe the logical sequence in the presentation of the theoretical framework.
11. Literature review	11.1. Does not provide a set of summaries of each work reviewed 11.2. Does not reveal the relationship of each work with other research. 11.3. Weaknesses in reporting the gaps in the previous study. 11.4. Does not resolve conflicts among the thesis, which identifies whether the writer is aware of the different views expressed in previous studies and can address these. 11.5. Does not aware of different views, which demonstrates the writer's insight into these divergent opinions. 11.6. Does not link the review to the rationale and purpose of work.
12. Thesis methodology and procedures	12.1. The researcher does not explain the method by which the sample was selected. 12.2. The thesis steps are presented in an illogical order. 12.3. Use of experimental, quasi-experimental, or descriptive methods to answer the non-thesis question - 'What is the programme..., or what is the strategy...'
13. The thesis community and its sample	13.1. The method for selecting the sample is not explained. 13.2. Lack of justification for choosing the purposive sample. 13.3. The thesis community's information sources have not been cited.

Thesis elements	Common mistakes
	13.4. The use of random sampling in experimental and quasi-experimental thesis.
14. Thesis tools and materials	14.1. The researcher does not justify the choice of certain tools over others. 14.2. The reliability test is not suitable for the thesis tools. 14.3. Weak validity of the tool's procedures. 14.4. Weak reliability of the tool's procedures. 14.5. Calculating the average test time by adding the time taken by the first student and the last student and then dividing by two.
15. Thesis procedures and results	15.1. The researcher does not explain the thesis procedures in detail. 15.2. The researcher does not link the thesis results with those of previous studies. 15.3. The researcher interprets the results without scientific evidence. 15.4. The researcher does not reveal their scientific personality and express their opinions independently.
16. Summary of thesis results, recommendations, and obstacles	16.1. Recommendation to generalize the results of the thesis when the sample is purposive. 16.2. Confusion between thesis recommendations and suggestions. 16.3. Suggesting studies that are not related to the thesis variables. 16.4. The researcher recommends achieving things that have already been achieved.
17. Thesis references	17.1. Refers to old references for new topics that have transformed their central concepts. 17.2. The researcher does not document the references in the text. 17.3. The researcher neglects to mention some references in the list. 17.4. The researcher does not correctly follow the rules of the American Psychological Association (APA).

About Akindele's (2008) guidelines, the researcher applied these to analyze students' literature reviews (52 completed master's theses). The model has been applied in previous studies (e.g., Akindele, 2008; Bacha, 2019) as it provides a comprehensive blueprint for such an analysis (Bacha, 2019). Akindele's guideline comprises six components related to four key issues: evaluation, critical thinking, authorial voice, and identity. The first component is a summary of each work. The second component reveals the relationship between each work and other research. The third component represents the gap in previous studies. The fourth component focuses on resolving conflicts among the thesis, which identifies whether the writer is aware of the different views expressed in previous studies and can address these. The fifth component reveals awareness of different views, which demonstrates the writer's insight into these divergent opinions. The final component represents the link to the study's purpose. It demonstrates whether the literature review can support this aim (see Table 2).

Table 2. Akindele's (2008) Guidelines for Analyzing the Literature Review

Review component	Realization
1. Summaries of each work Does the review provides a set of summaries of each work reviewed?	Evaluation
2. Relationship of each work with other research Does it show the relationship of each work with other research?	Evaluation
3. Filling gaps in previous study Does the review shed light on any gaps in previous research?	Evaluation & Critical thinking
4. Resolve conflicts among research Does the writer resolve the conflict amongst seemingly contradictory previous research?	Critical thinking
5. Awareness of different views Does the writer show insight and awareness of differing arguments?	Authorial voice/identity
6. Link with the purpose of study Does the writer link the review at all times to the rationale and purpose of work?	Authorial voice/identity

Akindele (2008 ,pp. 4, 10–11)

After preparing the list, the researcher then designed the two research tools, following which the percentage prevalence of mistakes was determined after arbitration by 7 faculty members in the following departments: Psychology, Measurement and Evaluation, Statistics, Curricula and Teaching Methods, who unanimously agreed on the following levels of prevalence:

Table 3. Percentage Prevalence of Common Mistakes in Master Theses

The level of commonality	Percentage of mistakes
Uncommon	Less than 10%
Fairly common	From 10% to less than 20%
Common	From 20% to less than 30%
Very common	From 30% to less than 40%
Extremely common	More than 40%

3.7. Research Tools

3.7.1. Analysis Card to Identify Common Mistakes in Master's Theses Specializing in Mathematics Education as Revealed by Their Content

Psychometric characteristics of the analysis card:

3.7.1.1. Validity of the Tool

Although the questionnaire's validity and reliability can be tested using several methods, the principal aspect of the questionnaire is validity, which reliability is a subset of. Validity indicates that the questionnaire is comprehensive and fairly addresses the matter under investigation (Gass & Mackey, 2007). Fraenkel and Wallen (2008, p. 153) define validity as "the appropriateness,

meaningfulness, and usefulness of the specific inferences researchers make based on the data they collect." Subsequently, the external validity of the questionnaire can be verified by considering the opinions of academics regarding its framework and content (Bryman, 2008; Cohen et al., 2007; Cowl, 1996; Gay & Airasian, 2003; Gass & Mackey, 2007). In order to attain this objective, this was presented to (7) faculty members who specialise in mathematics, following which (2) phrases were modified, (5) phrases were deleted, and (7) phrases were added, resulting in the final card containing (71) mistakes divided into (17) sections of the thesis. The researcher then returned it to the arbitrators for final approval.

Therefore, in this study, the researcher adopted face validity and content validity. Oppenheim (2001) stated that "content validity seeks to establish that the items or questions are a well-balanced sample of the content domain to be measured" (p. 162). There are numerous methods for attaining content validity, ranging from dependable research construction by submitting the plan to experts to statistical analysis of validity and reliability. There are formulae; for example, Cronbach's Alpha coefficient, which ranges from zero to one (unreliability-reliability) (Gay & Airasian, 2000).

3.7.1.2. Reliability of the Tool

The reliability coefficient was calculated by applying the Cooper equation to analyze (3) master's theses specializing in mathematics education that were not part of the research sample. To ensure diversity of analysts, these were analysed by (3) postgraduate students in addition to the researcher. Additionally, the researcher applied Cronbach's Alpha coefficient to evaluate the internal reliability of the questionnaire's different parts. A research instrument is regarded as reliable when the reappearance of the test produces similar results (Alduhayan & Ezat, 2002; Cohen et al., 2003). Moreover, it is encouraging that factor analysis indicated a similar pattern to the original design. The researcher used Cronbach's Alpha coefficient as a means of evaluating the reliability of the different parts of the questionnaire. This coefficient may have a maximum value of one and a minimum value of zero. Although the test is more reliable with higher values, exceptionally high values can cause problems. The results are reasonable, ranging from a minimum of 0.79 to a maximum of 0.90. The Cronbach's Alphas for each component are sufficiently high to conclude that the scales are reliable (internally consistent).

It is worth noting that some researchers, such as Alassaf (2010), believe that Cronbach's Alpha coefficient should be at least 0.80 to ensure reliability. However, other re-searchers, for example, Nunnally and Bernstein (1994), claim that Cronbach's Alpha coefficient should be at 0.70 or above. Moreover, Cohen et al. (2007, p. 506) contend that this coefficient may be considered as "> 0.90 very highly reliable, 0.80-0.90 highly reliable, 0.70-0.79 reliable, and 0.60-0.69 marginally/minimally reliable."

Agreement coefficient = (number of times of agreement/number of times of agreement + number of times of disagreement) x (100)

Table 4. Coefficients of Agreement Between the Analysts for Each Thesis

Thesis	The number for analyst one	The number for analyst two	The number of times of disagreement	The number of times of agreement	The number of times of disagreement + the number of times of agreement	Analysts' agreement percentage
The first	2	4	6	94	100	94

The second	4	3	8	92	100	92
The third	4	1	16	84	100	84
Averages			10	90	100	90

As indicated in Table 4, the lowest percentage of agreement was 84%, and the average percentage of agreement was 90%, which suggests the reliability of the tool and its suitability for use.

3.7.2. The Questionnaire Completed by Faculty Members on Common Mistakes in Master's Theses

3.7.2.1. The Validity of the Questionnaire

The questionnaire was presented to (11) faculty members from different Saudi universities who specialize in mathematics, as a result of which (6) phrases were modified, (10) phrases were added, and (4) phrase were deleted, resulting in (75) mistakes divided into (18) sections of the thesis.

3.7.2.2. Reliability of the Questionnaire

This was calculated using the split-half method and the Spearman-Brown equation. The total reliability coefficient was 97%.

4. Results

4.1. The Answer to the First Question

The first question states, 'What are the common mistakes made by mathematics students in master's theses at IAU according to content analysis?' Overall, 52 master's theses were analyzed, and the various mistakes in the theses were used as a unit of analysis; the results of which are presented in Table 4:

Table 5. The Common Mistakes Made by Mathematics Students in Master's Theses at IAU According to Content Analysis

Thesis elements	Common mistakes	Common		Uncommon		Arrangement according to thesis elements	The level of commonality
		Frequency	Percentage	Frequency	Percentage		
1. The thesis title	1.2. Titles have more than twenty words.	1	1.9	51	98.1	2	-
3. Thesis introduction	3.1. The introduction is too long.	1	1.9	51	98.1	1	-
	3.2. Writing the problem, thesis objectives, and thesis gaps unclearly.	8	15.3	44	84.7	2	*
	3.4. Includes old references.	1	1.9	51	98.1	5	-
4. Thesis problem	4.1. It depends on the opinion of the researcher; there is no scientific justification for the study.	1	1.9	51	98.1	1	-
6. Thesis importance	6.3. Confusion between the importance of the thesis and the reasons for choosing a thesis problem.	1	1.9	51	98.1	2	-
9. Thesis terms and variables	9.3. Expanding the definition of thesis terms by more than two definitions.	4	7.6	48	92.4	4	-
10. Theoretical framework	10.4. The researcher's personality is not clearly visible in the theoretical framework.	1	1.9	51	98.1	2	-
11. Literature review	11.1. Does not provide a set of summaries of each work reviewed.	1	1.9	51	98.1	1	-
	11.2. Does not reveal the relationship of each work with other research.	22	42.3	30	57.7	2	****
	11.3. Weaknesses in reporting the gaps in the previous study.	21	40.3	31	59.7	3	****
	11.4. Does not resolve conflicts among the thesis, which identifies whether the writer is aware of the different views expressed in previous studies and can address these.	22	42.3	30	57.7	4	****

Thesis elements	Common mistakes	Common		Uncommon		Arrangement according to thesis elements	The level of commonality
		Frequency	Percentage	Frequency	Percentage		
	11.5. Is not aware of different views, which demonstrates the writer's insight into these divergent opinions.	21	40.3	31	59.7	5	****
	11.6. Does not link the review to the rationale and purpose of work.	1	1.9	51	98.1	6	-
15. Thesis results and discussion	15.1. The researcher does not link the thesis results with those of previous studies.	25	48.0	27	51.9	1	****
	15.2. The researcher interprets the results without scientific evidence.	28	53.8	24	46.2	2	****
	15.3. The researcher does not reveal their scientific personality and expresses their opinions independently	30	57.6	22	42.4	3	****
	15.4 The researcher does not discuss the theories that were used in the thesis.	30	57.6	22	42.4	3	****
16. Summary of thesis results, recommendations, and obstacles	16.3. Suggesting studies that are not related to the thesis variables.	2	3.8	50	97.9	3	-
	16.4. The researcher recommends achieving things that have already been achieved.	3	5.7	49	94.3	4	-
17. Thesis references	17.1. Refers to old references for new topics that have transformed their central concepts.	4	7.6	48	92.4	1	-
	17.2. The researcher does not document the references in the text.	1	1.9	51	98.1	2	-
	17.4. The researcher does not correctly follow the rules of the American Psychological Association (APA).	3	5.7	49	94.3	4	-

(-) Uncommon, (*) Fairly common, (**) Common, (***) Very common, (****) Extremely common.

As indicated in Table 5, there are 62 uncommon mistakes, one fairly common mistakes, (0) common mistakes, (0) prevalent mistakes, and eight extremely common mistakes.

4.2. The Answer to the Second Research Question

The second question states: 'What are the common mistakes made by Saudi mathematics students in master's theses at IAU according to their supervisors?

The opinions of faculty members in IAU, including the supervisors and discussants of master theses specialising in mathematics education for students, were collected and are presented in Table 6:

Table 6. The Common Mistakes Made by Mathematics Students in Master Theses at IAU According to Their Supervisors

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
1. The thesis title2	1.1. Contains abbreviations.	13	0.052	1	0.009	1	0.015		0.020	1	0.000	9.6	1
	1.2. Titles have more than twenty words.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4	2
2. Abstract	2.2. Considering an abstract and summary as the same, therefore calling it a summary instead of an abstract.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9	6
	2.4. Does not include thesis methods.	15	0.060	1	0.009	0	0.000	0		0.000	0.000	6.9	4
	2.6. Does not include the results for all the thesis questions	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9	1

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
3. Thesis introduction	3.1. The introduction is too long.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	2
	3.2. The paragraphs are too long.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4	1
	3.4. Includes old references.	15	0.060	0	0.000	1	0.015	0	0.000	0	0.000	7.5 -	4
	3.5. There is no linkage between paragraphs (surprising the reader).	15	0.060	0	0.000	1	0.015	0	0.000	0	0.000	7.5 -	3
5. Thesis questions	5.3. Formulating complex questions.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	1
6. Thesis objectives	6.3. The objectives are not related to the thesis questions.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	2
	6.4. Exaggeration in writing the objectives of the thesis.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	3
7. Thesis importance	7.3. Confusion between the importance of the thesis and the reasons for choosing a thesis problem.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	2

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
8. Thesis hypotheses, if any	8.1. Formulating them even when not needed.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	2
	8.4. Positing several hypotheses that do not fit the thesis questions	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	3
9. Thesis terms and variables	9.1. The thesis terms do not include the variables.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	4
	9.2. Quoting definitions that do not correspond to the definition of the procedural researcher.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	3
	9.3. Expanding the definition of thesis terms by more than two definitions.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	2
	9.6. Lack of connection between procedural definition and thesis procedures and tools.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	2
	10.3. Thesis concepts are not standardised; for example, they refer	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	2

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
10. Theoretical framework	to both students and pupils.												
	10.4. The researcher's personality is not clearly visible in the theoretical framework.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4	2
												-	
	10.5. Insufficient number and lack of variety of information sources.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4	3
												-	
	10.6. Failure to observe the logical sequence in the presentation of the theoretical framework.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4	1
												-	
11. Literature review	11.3. Weaknesses in reporting the gaps in the previous study.	0	0.000	0	0.000	2	0.030	5	0.100	9	0.234	36.4	3

	11.4. Does not resolve conflicts among the thesis, which identifies whether the writer is aware of the different views expressed in previous studies and can address these.	0	0.000	0	0.000	3	0.045	3	0.060	10	0.260	36.5	4

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
	11.5. Does not aware of different views, which demonstrates the writer's insight into these divergent opinions.	1	0.004	1	0.009	0	0.000	6	0.120	8	0.208	34.1 ***	5
	11.6. Does not link the review to the rationale and purpose of work.	0	0.000	0	0.000	1	0.015	5	0.100	10	0.260	37.5 ***	6
	11.7. Indifferent to the inclusion of the reputable articles in their review.	0	0.000	0	0.000	0	0.000	6	0.120	10	0.260	38.0 ***	7
12. Thesis methodology	12.1. The researcher can not decide who would be the thesis subjects, making a comparison between data and sources of data, and also the design of instruments.	3	0.012	6	0.054	1	0.015	1	0.020	5	0.130	23.1 **	1
	12.2. Does not select the thesis method correctly.	2	0.008	2	0.018	0	0.000	04	0.080	7	0.182	28.8 **	2
	12.3. Failure to determine the processes required to	2	0.008	1	0.009	4	0.060	4	0.080	5	0.130	28.7 **	3

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
	collect and analyse data.												
14. Thesis tools and materials	14.1. The researcher does not justify the choice of certain tools over others.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	1
	14.2. The reliability test is not suitable for the thesis tools.	15	0.060	1	0.009	0		0	0.000	0	0.000	6.9 -	2
	14.4. Weak reliability of the tool's procedures.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	1
15. Thesis results and discussion	15.1. The researcher does not link the thesis results with those of previous studies.	4	0.016	3	0.027	3	0.045	2	0.040	4	0.104	23.2 **	1
	15.2. The researcher interprets the results without scientific evidence.	3	0.012	4	0.036	4	0.060	4	0.080	1	0.026	21.4 **	2
	15.3. The researcher does not imply deep and critical explanations regarding the results' contributions.	4	0.016	4	0.036	4	0.060	3	0.060	1	0.026	19.8 *	3

Thesis elements	Common mistakes	Uncommon		Fairly common		Common		Very common		Extremely common		The average of the commonality and its level	Arrangement according to thesis elements
		Frequency (F)	Percentage (p)	(F)	(p)	(F)	(p)	(F)	(p)	(F)	(p)		
	15.4 The researcher does not discuss the theories that used in the thesis.	3	0.016	4	0.036	4	0.060	4	0.080	1	0.026	21.4 **	4
17. Thesis references	17.1. Refers to old references for new topics that have transformed their central concepts.	15	0.060	1	0.009	0	0.000	0	0.000	0	0.000	6.9 -	4
	17.3. The researcher neglects to mention some references in the list.	14	0.056	2	0.018	0	0.000	0	0.000	0	0.000	7.4 -	2
	17.4. The researcher does not correctly follow the rules of the American Psychological Association (APA).	15	0.060	1	0.009	0		0	0.000	0	0.000	6.9 -	2

(-) Uncommon, (*) Fairly common, (**) Common, (***) Very common, (****) Extremely common

As indicated in the table, there are 63 uncommon mistakes, 1 fairly common mistake, 6 common mistakes, 5 very common mistakes, and 0 extremely common mistakes.

4.3. The Answer to the Third Research Question

The third question states: 'What is the relationship between common mistakes in master's theses identified by faculty members and those revealed by content analysis?'

To answer this question, the researcher tested the null hypothesis, which states: 'There is no significant correlation (0.05) between the analysis of common mistakes in the different elements of the master's thesis and the opinions of faculty members.' To test the hypothesis, the researcher used the Spearman correlation coefficient due to its suitability for the data, the results of which are presented in the following Table 7:

Table 7. The Relationship Between Common Mistakes in Master Theses Identified by Faculty Members and Those Revealed by Content Analysis

Number	Mistakes according to thesis elements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	The thesis title	0.93																			
2	Abstract		0.92																		
3	Thesis introduction			0.91																	
4	Thesis problem				0.93																
5	Thesis questions					0.92															
6	Thesis objectives						0.9														
7	Thesis importance							0.94													
8	Thesis hypotheses, if any								0.94												
9	Thesis limits									0.10											
10	Thesis terms and variables										0.94										
11	Theoretical framework											0.90									
12	Literature review													**1							

Number	Mistakes according to thesis elements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
13	Thesis methodology and procedures													0.50							
14	The thesis community and its sample														0.94						
15	Thesis tools and materials															0.95					
16	Thesis results and discussion																**1				
17	Summary of thesis results, recommendations, and obstacles																	0.95			
18	Thesis references																		0.94		
19	Thesis Supplements																			0.10	

* Significance at the level of (1%) **Significance at the level of(%5)

As indicated in the table, there is a statistically significant correlation (0.05) between the analysis of the content and the opinions of faculty members for only two elements (Literature review mistakes and Thesis results and discussion), and there is a significant general correlation between the content analysis and the opinions of faculty members. Therefore, the null hypothesis is rejected.

5. Discussion

This study aimed to identify common mistakes made in master's theses on mathematics education by Saudi students at IAU, as determined through content analysis and faculty members' views. Regarding the first question, Table 4 indicates that there are 62 uncommon mistakes, 1 fairly common mistake, 0 common mistakes, 0 very common mistakes, and 8 extremely common mistakes. This finding is consistent with those of Kojak (2007) and Abdel-Fattah (2011).

Notably, the extremely common mistakes were identified (4) times in a literature review section, and (3) times in a discussion section, with a commonality rate greater than (40%), as follows: Weaknesses in reporting the gaps in the previous study, does not resolving conflicts among thesis, which identifies whether the writer is aware of the different views expressed in previous studies and can address these, does not aware of different views, which demonstrates the writer's insight into these divergent opinions, and does not link the review to the rationale and purpose of work. This appears to be consistent with studies by Hassan (2011), Kafipour et al. (2018), and Kojak (2007). In addition, the researchers fail to link their thesis results with those of previous studies, interpret the results without providing scientific evidence, and do not reveal their scientific background or express their opinions independently.

An intriguing finding is that a fairly common type of mistake was writing the problem, thesis objectives, and thesis gaps unclearly in the introduction section, at a rate of 15.3%. According to the study findings, students in mathematics master's programmes experience challenges with writing introduction sections, with the aspects of problem formulation, thesis objectives, and thesis deficiencies being particularly problematic. The reason students found these parts challenging is that they lacked sufficient comprehension of the required strategy to formulate these sections. Experts in this field have recommended that for the effective formulation of a thesis, topics or areas that remain unexplored or in which information is lacking should be identified (Ching Hei & Khemlani, 2015; Tsoulfas, 2021). Additionally, a critical factor in a successful thesis is ensuring that the formulation of the thesis problem is clearly defined; the main shortcoming of such a thesis is the lack of clarity in the thesis problem (El-Freihat, 2021).

Moving to the literature review section, there were extremely common mistakes, with percentages of 42.3%, 40.3%, 42.3%, and 40.3%, respectively. The findings indicate that master's students in the field of mathematics find it challenging to write a literature review; indeed, multiple students lack an understanding of how their literature review can be developed. This result further enhances our understanding of the fact that writing a literature review requires a wide range of analytical and rhetorical skills, in addition to academic writing skills, to be synthesized. Students must also understand the concepts of argumentation and critical analysis (Turner & Bitchener, 2008). This idea is supported by other studies (e.g., Kafipour et al., 2018).

Critically analyzing the literature review sections of the students' theses according to Akendele's model revealed that although the majority of students could effectively summarise the individual works and connect them with their own study's aims, their ability to report deficiencies in past research and resolve disagreements between studies was severely limited. This result aligns with Randolph's theory that the majority of researchers are unable to consider opposing findings and different interpretations when synthesizing quantitative literature.

Furthermore, the literature review sections written by students primarily adopted an authorial voice and evaluative approach, rather than a critical thinking approach. This means that most students merely presented a summary of the results and interpretations of previous researchers instead of critically examining every aspect of their thesis. Despite being able to write proficiently, the majority were incapable of synthesising, critiquing, or explaining the works. This finding aligns with previous research, which has shown that when students are unable to think critically, they often

merely report the thesis methodology, design, and analysis within their theses, without providing justifications or logical reasons for their writing (e.g., Akindele, 2008; Boote & Beile, 2005). This outcome highlights the importance of fostering students' critical thinking abilities (Shahsavar et al., 2013; Simpson & Courtney, 2002). By developing these abilities, students will be able to justify and connect distinct ideas and concepts. This is likely to be due to the fact that becoming competent and familiar with strategies for learning language, particularly those that are cognitive and metacognitive in nature, can promote deep processing and neurological stimulation (Hamzah et al., 2009).

The findings of the research also show that mistakes were made with writing the Discussion part of a thesis (Chapter four), as 48.08%, 53.8%, 57.6%, and 57.6% of the theses alluded to this fact. At the core of all scientific thesis is the Discussion section, which is the means by which researchers are capable of expressing their capacity and interpretive creativity.

According to the study findings, students most frequently make mistakes in the Discussion section (Chapter Four) because they are unable to relate their thesis findings to past studies (Safnil, 2018). Both Rahmiati (2015) and Shahsavar and Kourepaz (2020) reported similar conclusions, stating that students often ignored the comments lecturers made on revising their writing, instead choosing to copy the style of writing adopted by other students. They believe their knowledge is insufficient to write the results and discussion sections of their papers. Defazio et al. (2015) supported this conclusion, arguing that a key element of writing competence is cognitive ability, as the skill of writing is considered more challenging to grasp than speaking, listening, and reading. Consequently, numerous students struggle to complete thesis reports that include all the required elements.

In fact, this concurs with the views of supervisors, who suggested that students to whom they were providing guidance expressed concern about their ability to relate their findings to those of previous studies, although the mistake that occurs most commonly in this regard is that it is written in the form of a literature review. Thus, they alluded to the fact that rather than being a literature review, the Discussion section should make a comparison with the findings of previous researchers, explaining how their work is either similar to or different from theirs. In this regard, one of the faculty members stated that:

There are various instances in which scholars have overlooked the findings of scientific research as the researchers in question have not interpreted the results appropriately. Consequently, it is essential to critically interpret data, and researchers should not merely accept the claims of others when making a particular argument. It is in this section that authors can boldly propose ideas and make suggestions, while also explaining the results; fundamentally, it is their opportunity to engage in interpretive creativity. Additionally, in this section, the author can criticise previous studies identified as being flawed.

With regard to the second question, Table 5 revealed that the opinions of mathematics faculty members limited the number of common mistakes identified in master's theses in the field of mathematics education as follows: Uncommon mistakes (63), fairly common mistakes (1), common mistakes (6), and very common mistakes (5). This differed from the result of the content analysis, where there was a spread from (uncommon) to (extremely common).

The questionnaire findings indicate that faculty members who participated in the research expressed the opinion that the literature review was the thesis section in which "almost all" master's students at IAU made mistakes, as the averages were 36.4%, 36.5%, 34.1%, 37.5%, and 38.0% respectively. As shown in the Table, the participants reported that mistakes were most commonly made during the thesis preparation process when compiling the Literature Review. This constitutes an interesting finding, as content analysis revealed similar conclusions in relation to the frequent mistakes made by Saudi mathematics students at IAU when writing their master's theses. In their questionnaire responses, three participants referred to the fact that students disregard the

importance of the Literature Review Section in their thesis based on the assumption that all that is required in this section is an explanation of the relevant theory and the findings of past researchers, with no necessity to mention the flaws of other studies or resolve the lack of agreement between researchers. According to the respondents, when writing their literature review sections, students mainly chose to adopt an evaluative approach and authorial voice rather than engaging in critical thinking. This indicates that students struggle to formulate the literature review section of their theses, which is categorized as a "common mistake".

The study findings concur with those reported by Defazio et al. (2015), suggesting that students develop the ability to write effectively through cognitive mastery of the subject matter. This requires students to learn, understand, apply, and synthesize new knowledge. Nevertheless, this contradicts the findings of Ching Hei and Khemlani (2015) and Shahsavar and Kourepaz (2020), who suggested that in all studies, authors must ensure that they write the literature review effectively to enable readers to understand and be cognisant of the approach and research conducted. Additionally, ensuring the appropriateness of the literature review facilitates the process of elaborating the results of the research (Wee & Banister, 2016). Musa and Khamis (2015) contended that the primary objective of the literature review section is to identify the limitations of other studies and pave the way for these limitations to be exploited in future work. Hence, the literature review should not only include a personal judgment statement but also a discussion of notable values and ideas. In the literature review, authors should not only present a summary of the findings published by other researchers, but should also include a critical discussion in which they critically analyse other works. Accordingly, Ching Hei and Khemlani (2015) claimed that when writing their master's thesis, students should pay particular attention to the quality of the literature review section, because the literature review part is one of the most important sections in writing a thesis for master students.

It is worth noting that a common opinion among all respondents was that students often failed to consider whether the articles included in their review had suitable quality. Rather, they chose to download publications with seeming relevance, regardless of their reputability, which may have led to challenges in searching library databases that lack full-text access to many high-quality articles. This oversight could negatively impact the literature review sections of their theses. Akindele (2008) stated that the effectiveness of a literature review will be compromised if the author fails to evaluate how articles with varying levels of quality differ and are similar.

One interesting result is that the method section is another area in which mistakes are commonly made, as the average were 23.1%, 28.8%, and 28.7% respectively. According to the faculty members, students experienced problems in terms of their thesis abilities in the method part (from the most common type), thus indicating that they were confronted with challenges with the thesis method employed. Thirteen respondents noted that their students encountered difficulties with the thesis method, specifically in selecting thesis subjects, comparing data sources, and designing instruments. Nevertheless, it is fortunate that three of respondents chose (uncommon) in the following phrase "The researcher can not decide who would be the thesis subjects, making a comparison between data and sources of data, and also the design of instruments".

With regard to the second thesis skill, another mistake was commonly referenced. First, the respondents expressed the belief that a common problem experienced by students involved the selection of thesis method. In this regard, they are required to select an approach that corresponds to the issue being researched and the findings to be revealed. This concurs with the findings of Imafuku et al. (2015), which reveal that numerous master's students evaluated the thesis method selection when conducting their thesis to ensure it was appropriate. They reported that multiple master's students, similar to those in the present research, were concerned that the method adopted when conducting the thesis would be insufficient for investigating the issue in question.

It is worth noting that, in the present study, only 10% of the respondents believed that data collection posed a challenge for students. They emphasized the fact that, as a result of suitably designed instruments, the data collection process was relatively straightforward. This disagrees with the findings of another study, in which undergraduate students experienced challenges in determining the processes required to collect and analyse data. The assumption is made that this problem was caused by the fact that they were still at the undergraduate level and their research skills were not sufficiently developed, unlike the present study.

Because the present study examined the mistakes commonly made by master's students in mathematics at IAU when conducting a thesis, it included the manner in which they selected the thesis method, differentiated data and sources of data, designed instruments, and collected and analysed data. A previous study (Pertiwi, 2020) found that students were capable of designing instruments for conducting their thesis. Nevertheless, the respondents expressed concern about the findings regarding the process by which students chose and processed suitable data that would subsequently be analyzed to produce results. Pertiwi (2020) also assumed that numerous students were not completely honest about whether they had actually completed the process of collecting data in its entirety. From a pedagogical perspective, Thomas (2013), as cited in Pertiwi and Weganofa (2015), emphasized that the selection of thesis method is critical, as it involves two key factors: the methods used for conducting the thesis processes and the methods of determining answers to the thesis questions. Thomas (2013) emphasised that a suitable method will not guarantee that the study results will ultimately be good, but effective usage of methods will ensure that the results yielded are appropriate and coherent. Comprehending the thesis method involves understanding the processes that must be implemented regarding the topics in question, the number of subjects selected, the instruments that will be provided for the subjects, as well as the advantages and drawbacks of such processes. Consequently, the problems confronting students will be minimized, and at the very least, they will be able to address any unexpected thesis issues that may arise.

Another section in which mistakes are commonly made is the Discussion section (Chapter four), as the averages were 23.2%, 21.4%, 19.8%, and 21.4%, respectively. This indicates that the respondents confirmed their students were not competent in understanding the implications of their studies. Given the need to elaborate on contributions in the field and discipline, it is unsurprising that master's students faced challenges in writing this section. While such students may be capable of comparing the results and providing a critical explanation, connecting to and not reaching the literature is hard for them. This finding concurs with the studies of Basthomi (2009) and Rahkmawati (2013), who reported similar conclusions, suggesting that students did not include a review of the extant literature corresponding with the study findings. Additionally, students did not provide relevant arguments in their thesis, which concurs with or opposes the pertinent literature. Furthermore, the students were incapable of providing in-depth explanations of (un)expected results, which is critical for comparison with past studies.

In fact, the assumption was made that when conducting a thesis, the ability to emphasize the implications was an area in which students commonly lacked, as they are expected to provide in-depth explanations regarding the contributions of the results. This finding contradicts Rakhmawati (2013), who reported that some students with a mastery of this skill offered certain hypotheses and exemplifications. Additionally, she stated that such in-depth explanations involve a comparison with the distinct aspects of other studies, which would presumably be regarded as being the strengths of the present study in comparison to the other literature. Evidently, a discussion is akin to a "a mirror" (Swales, 2004), as cited in Rakhmawati (2013), which attempts to reflect on the introduction and literature sections.

One interesting result is that the researcher does not discuss the theories used in the thesis, which is another area where mistakes are commonly made. Therefore, the theory(s) highlighted at

the theoretical review stage must also be used in discussing the study findings. The author must clearly demonstrate how the tenets of the theory are useful in linking the study's findings to the gaps it seeks to fill (Corrine, 2016).

Regarding the third question, a significant correlation exists between the analysis of common mistakes in the elements of a master's proposal and the opinions of faculty members at IAU. This indicates faculty members are aware of the actual prevalence of these mistakes in theses. It is interesting to note that the most common mistakes in master's theses, as analyzed in terms of content and faculty members' perspectives, were in the "literature review" and "thesis results and discussion" sections. Therefore, there is a need to hold meetings and panel discussions about these mistakes in order to find solutions.

This agrees with Mousavi & Kashefian- Naeeni (2011), Boote & Beile (2005), and Fergie et al. (2011), who stated that while the ability to write effectively can result in beneficial academic outcomes, the majority experience the most difficulties with the section involving the review of the literature. Randolph (2009) claimed that if the review of the literature contains deficiencies, this can result in all other parts of the thesis also being deficient. Akindele (2008) contended that when evaluating a thesis, examiners form an initial impression of its quality after completing their review of the literature, which constitutes a critical aspect of the thesis. In the discussion section, the primary purpose is to help readers understand the study's results by exploring the significant points, implications in various areas, and potential improvements for future developments. However, it is commonly challenging for researchers to realize what should be covered in the discussion section (Taherdoost, 2022; Safnil, 2018; Rahmiati, 2015; Shahsavar & Kourepaz, 2020; Defazio et al., 2015; Basthomi, 2009; Rahkmawati, 2013). Therefore, there is a need to hold meetings and panel discussions about these mistakes in order to find solutions.

6. The Research Limitations

Objective limits: Common mistakes were limited to a list prepared by the researcher and then presented to nine faculty members at IAU specializing in mathematics. Time limits: The research was conducted during the second semester of the 2023-2024 academic year. Place limits: The research was conducted in IAU (Dammam city). However, the researcher believes that this city is a good place to conduct this study, as it has a large population drawn from different parts of the Kingdom of Saudi Arabia. Human limits: The current research was limited to mathematics master students and faculty members.

7. Recommendations

Based on the results, the researcher recommends the following: Firstly, incorporating common mistakes in master's theses into scientific research courses within the curricula and teaching methods of mathematics programmes. Secondly, the Department of Curricula and Teaching Methods will hold panel discussions for faculty members to address common mistakes in master's theses and explore solutions to avoid them. Thirdly, providing researchers with examples of these mistakes through the thesis writing guide on scientific studies offered by colleges. Fourthly, holding training courses for master students on these mistakes so that they can avoid them in the future. Fifthly, the results indicated that writing a literature review is not an easy task for master students in mathematics education. Therefore, relevant stakeholders at the university need to help master's students become more accurate in this aspect of the thesis. Sixthly, it was notable that thesis results and the discussion section ranked second among the mistakes for those master students; therefore, the faculty members of mathematics education should train and help students to do better before starting to write their thesis. Seventhly, one interesting result is that the method section is another area in which mistakes are commonly made; therefore, relevant stakeholders in the university need to help master students to decide who would be the thesis subjects, making a comparison between data and sources

of data, and also the design of instruments. Additionally, help them select the thesis method correctly and determine the processes required to collect and analyze the data. Lastly, relevant stakeholders in the university should assist master's students in writing the introduction section, particularly in clearly defining the problem, thesis objectives, and thesis gaps.

8. Suggestions

Based on the results, the researcher suggests the following: Future research could investigate common mistakes in master's theses for other subjects and compare the results with those of other studies in Saudi Arabia, Arab countries, and foreign universities in the same discipline. In addition, further studies could examine the common mistakes in doctoral-level mathematics education theses. Moreover, future research could investigate common mistakes in doctoral theses for other subjects and compare the results with those of other studies in Saudi, Arab, and foreign universities in the same discipline.

Declarations

Author Contributions. The author has read and approved the published version of the article.

Conflicts of Interest. The author declares no conflict of interest.

Funding. The author received no financial support for this research.

Ethical Approval. Permission to conduct the research was granted through the Research Ethics Committee of IAU (IRB-2023-15-541)

Data Availability Statement. Data is available by the corresponding author upon request.

References

- Abbas, M., Nofal, M., Al-Absi, M., & Abu Awwad, F. (2014). *An Introduction to Research Methods in Education and Psychology* (5th Edition). Amman: Dar Al Masirah for publication and distribution.
- Abdel-Fattah, F. (2011). Evaluating the quality of previous studies in undergraduate theses. *A working paper presented at the Scientific Forum of the College of Graduate Studies Naif Arab University for Security Sciences*. Riyadh, 1, 1 - 21.
- Afana, E. I. S. (2011). Common mistakes in educational research designs among postgraduate students in Palestinian universities. *A working paper presented to the Scientific Research Conference: Concepts - Ethics - Employment*. Gaza: The Islamic University, 305-336.
- Akindele, O. (2008). *A critical analysis of the literature review section of graduate dissertations at the University of Botswana*. http://www.espworld.info/Articles_20/DOC/GRADUATE_DISSERTATIONS_SITE.pdf
- Al-Askar, A. A. (2011). *Scientific Research Methodology in Psychological and Educational Sciences*. Cairo: Egyptian Office for Publications.
- Alassaf, S. (2010). *An introduction to research in behavioral sciences*. Obaykan Bookshop.
- Alduhayan, S., & Ezat, H. (2002). *Data analysis with SPSS 16*. Obikan.
- Al-Khalili, K. Y. (2012). *Fundamentals of educational scientific research*. United Arab Emirates: Dar Al Qalam for Publishing and Distribution.
- Al-Safra N, M. (2020). Common mistakes in doctoral dissertations, major general curricula, and teaching methods at King Khalid University, in the light of analyzing its content and the opinions of faculty members. *King Khalid University Journal of Educational Sciences*, 7 (1), 195-222.

- Bacha, N. N. (2019). Writing the argumentative literary review in EFL/ESL contexts: A critical analysis perspective. *International Journal for Innovation Education and Research*, 7(1), 1-12. <https://doi.org/10.31686/ijer.Vol7.Iss1.1309>.
- Basthomi, Y. (2009). Examining Research Spaces. *TEFLIN Journal*, 20(2), 140–158. <https://doi.org/10.15639/teflinjournal.v20i2/140-158>
- Benzie, H. J., & Harper, R. (2020). Developing student writing in higher education: digital third-party products in distributed learning environments. *Teaching in Higher Education*, 25(5), 633–647. <https://doi.org/10.1080/13562517.2019.1590327>
- Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, 34(6), 3–15. <https://doi.org/10.3102/0013189X034006003>.
- Bryman, A. (2008). *Social research methods*. Oxford University Press.
- Chinese, S. I. (2010). *Basic rules in scientific research*. Al-Madinah Al-Munawwarah: Al-Risala Foundation.
- Ching Hei, K., & David, M. K. (2015). Basic and Advanced Skills They Don't Have: The Case of Postgraduate and Literature Review Writing. *Malaysian Journal of Learning and Instruction*, 12(1), 131–150. <https://doi.org/10.32890/mjli2015.12.7>
- Cohen, L., Manion, L., & Morrison, K. (2003). *Research methods in education*. (5th ed.). Routledge Falmer. <https://doi.org/10.4324/9780203224342>
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (7th ed.). Routledge Falmer. <https://doi.org/10.4324/9780203029053>
- Cooper, H. M. (1988). Organizing knowledge synthesis: A taxonomy of literature reviews. *Knowledge in Society*, 1(1), 104–126. <https://doi.org/10.1007/bf03177550>
- Crowl, T. K. (1996). *Fundamentals of educational research*. Brown & Benchmark.
- Defazio, J., Jones, J., Tennant, F., & Hook, S. A. (2015). Academic literacy: The importance and impact of writing across the curriculum-a case study. In *Journal of the Scholarship of Teaching and Learning* (Vol. 10, Issue 2). www.iupui.edu/~josotl
- El-Freihat, S. M. (2021). Challenges facing students in writing theses at the Jordanian universities. *Cypriot Journal of Educational Sciences*, 16(6), 3266–3277. <https://doi.org/10.18844/cjes.v16i6.6321>
- Fergie, G., Beeke, S., McKenna, C., & Crème, P. (2011). It's a lonely walk: Supporting postgraduate researchers through writing. *International Journal of Teaching and Learning in Higher Education*, 23(2), 135–149. <https://eric.ed.gov/?id=EJ946149>
- Fraenkel, J. R., & Wallen, N. E. (2008). *How to Design and Evaluate Research in Education*. McGraw-Hill Higher Education.
- Gass, S. M., & Mackey, A. (2007). *Data elicitation for second and foreign language research*. Lawrence Erlbaum Associates. <https://doi.org/10.4324/9780203826102>
- Gay, L. R., & Airasian, P. (2000). *Educational research: Competencies for analysis and application* (6th ed.). Prentice Hall.
- Gay, L. R., & Airasian, P. W. (2003). *Educational research: Competencies for analysis and applications* (7th ed.). Mer-rill/Prentice Hall.

- Hamzah, M. S. G., Kafipour, R., & Abdullah, S. K. (2009). Vocabulary learning strategies of Iranian undergraduate EFL students and its relation to their vocabulary size. *European Journal of Social Sciences*, 11(1), 39–50. https://www.academia.edu/13315871/Vocabulary_learning_strategies_of_Iranian_undergraduate_EFL_students_and.
- Hassan, E. A. M. (2016). Common Mistakes of Researchers in Psychological and Educational Research. *Working paper submitted to the conference: Education Technology and Global Challenges for Education: The Arab Association for Educational Technologies*. Cairo: Arab Society for Educational Technologies, 67-85.
- Huang, R. (2007). A Challenging but worthwhile experience: Asian international student perspectives of undertaking a dissertation in the UK. *Journal of Hospitality, Leisure, Sport and Tourism Education*, 6(1), 29-38. <https://doi.org/10.3794/johlste.61.130>
- Imafuku, R., Saiki, T., Kawakami, C., & Suzuki, Y. (2015). How do students' perceptions of research and approaches to learning change in undergraduate research? *International Journal of Medical Education*, 6, 47–55. <https://doi.org/10.5116/ijme.5523.2b9e>
- Jazan University Preparatory Year Students. *Journal of Education and Practice*, 9 (11).
- Kachru, B. (1999). *The alchemy of English*. Pergamon.
- Kafipour, R., Mahmoudi, E., & Khojasteh, L. (2018). The effect of task-based language teaching on analytic writing in EFL classrooms. *Cogent Education*, 5(1), 1496627. <https://doi.org/10.1080/2331186X.2018.1496627>.
- Kafipour, R., Mahmoudi, E., & Khojasteh, L. (2018). The effect of task-based language teaching on analytic writing in EFL classrooms. *Cogent Education*, 5(1), 1496627. <https://doi.org/10.1080/2331186X.2018.1496627>
- Kayed, A., & Adass, A. (2012). *Scientific Research: Its Concept, Tools, and Methods* (14th edition). Amman: Dar Al-Fikr Publishers and Distributors.
- Khozaei Ravari, Z., & Tan, K. E. (2019). A qualitative investigation of strategies and experiences of non-native students writing master's theses. *Journal of Applied Research in Higher Education*, 11(2), 310-324. <https://doi.org/10.1108/JARHE-07-2018-0120>
- Kojak, K. H. (2007). *Common mistakes in educational research*. Cairo: World of Books.
- Lopez, M. C. (2014). *Survey of research methods: Literature review*. Michigan State University. Online article.
- Mallett, S. (2004). Understanding home: A critical review of the literature. *The Sociological Review*, 52(1), 62–89. <https://doi.org/10.1111/j.1467-954X.2004.00442.x>.
- Mousavi, H. S., & Kashefian-Naeeni, S. (2011). An investigation into the role of EFL learners' attitudes, motivation and proficiency in learning among Iranian students of National University in Malaysia. *European Journal of Social Sciences*, 23(4), 593–603. <https://doi.org/10.18848/1447-9494/CGP/v17i08/47224>.
- Musa, N. F., & Khamis, N. (2015). Research article writing: A review of a complete rhetorical organisation. *Pertanika Journal of Social Sciences and Humanities*, 23(August).
- Notar, C., & Cole, V. (2010). Literature Review Organizer. *International Journal of Education*, 2 (2), 1-17. <https://doi.org/10.5296/ije.v2i2.319>

- Nouri, J., Larsson, K., & Saqr, M. (2019, September). Identifying factors for master thesis completion and non-completion through learning analytics and machine learning. In *European Conference on Technology Enhanced Learning* (pp. 28-39). Springer .https://doi.org/10.1007/978-3-030-29736-7_3
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. McGraw-Hill.
- Oppenheim, A. (2001). *Questionnaire design, interviewing and attitude measurement*. Continuum.
- Patterson, J., & Gilkison, A. (2020). Writing a journal article from your thesis or research project. *New Zealand College of Midwives Journal*, 2020(56), 13-16. <https://doi.org/10.12784/nzcomjn156.2020.2.13-16>
- Pertiwi, W. H. S. (2020). *Teaching research in undergraduate English language teacher education degree programs in Indonesia: A case study* [PhD these]. Charles Darwin. University. <http://doi.org/10.1016/j.ndteint.2014.07.001%0>
- Pertiwi, W. H. S., & Weganofa, R. (2014). Students' understanding of qualitative research methods: A reflection on research articles. *LiNGUA: Journal of Language and Literature*, 10(1), 18-18.
- Rahmiati. (2015). Analisis Kendala Internal Mahasiswa dalam Menulis Karya Ilmiah (Analysis of Students' Internal Constraints in Writing Scientific Papers). *Al Daulah: Jurnal Hukum Pidana dan Ketatanegaraan*, 4(2), 327 – 343. <https://doi.org/10.24252/ad.v4i2.1486>
- Rakhmawati, A. (2013). English research article written by Indonesian academics: Coping with common practices and rhetorical diversity. In *FLLT 2013 Conference Proceedings* (pp. 265- 275). The Language Institute of Thammasat University
- Randolph, J. (2009). A guide to writing the dissertation literature review. *Practical Assessment, Research & Evaluation*, 14(13), 1-14. <http://pareonline.net/getvn.asp?v=14&n=13>
- Safnil, A. (2018). *Kesulitan Penulis Indonesia Dalam Bidang Ilmu Sosial dan Humaniora untuk Menembus Jurnal Internasional Bereputasi berbahasa Inggris*. Bengkulu: Universitas Bengkulu.
- Shahsavari, Z., & Kourepaz, H. (2020). Postgraduate students face difficulties in writing their literature review for their theses. *Cogent Education*, 7(1), 1-11. <https://doi.org/10.1080/2331186X.2020.1784620>
- Shahsavari, Z., Tan, B. H., Yap, N. T., & Bahaman, A. S. (2013). Promoting tertiary-level students' critical thinking through the use of Socratic questioning on the blog. *Pertanika Journal of Social Science & Human*, 21(S), 57–70. https://www.researchgate.net/publication/289950616_Promoting_tertiary_level_students'_critical_thinking_through_the_use_of_socratic_questioning_on_the_blog
- Simpson, E., & Courtney, M. (2002). Critical thinking in nursing education: Literature review. *International Journal of Nursing Practice*, 8(2), 89–98. <https://doi.org/10.1046/j.1440-172x.2002.00340.x>
- Stapleton, P. (2002). Critical thinking in Japanese L2 writing, rethinking tired constructs. *ELT Journal*, 56 (3), 250–257. <https://doi.org/10.1093/elt/56.3.250>.
- Swales, J. M. (2004). *Research Genres: Explorations and Applications*. Cambridge University Press.
- Thomas, G. (2013). *How to do your research project*. SAGE Publication Limited.
- Tsoufas, G. (2021). The Importance of Research. In *Journal of the American College of Surgeons* (Vol. 232, Issue 5). <https://doi.org/10.1016/j.jamcollsurg.2021.02.003>

- Turner, E., & Bitchener, J. (2008). An approach to teaching the writing of literature reviews. *Zeitschrift Schreiben*, 1–10. Online. https://zeitschrift-schreiben.eu/globalassets/zeitschrift-schreiben.eu/2008/turner_approach_teaching.pdf (accessed 18 May 2025)
- Wee, B. V., & Banister, D. (2016). How to Write a Literature Review Paper? *Transport Reviews*, 36(2). <https://doi.org/10.1080/01441647.2015.1065456>
- Zabihi, L., & Shubar, E. (2017). Common mistakes in scientific research. *Journal of Humanities and Social Sciences, Scientific Research Generation Center*, (29), 11-23.
- Zotzmann, K., & Sheldrake, R. (2021). Postgraduate students' beliefs about and confidence for academic writing in the field of applied linguistics. *Journal of Second Language Writing*, 52. <https://doi.org/10.1016/j.jslw.2021.10.0810>

About the Contributor(s)

Dr. Mansour Saleh Alabdulaziz, is an Associate Professor in Mathematics Education at the Imam Abdulrahman bin Faisal University, Saudi Arabia. He earned his master's degree from The University of East Anglia and his Ph.D. from Durham University, UK, both in Mathematics Education. He received the "Excellence Award for publication in refereed scientific journals" from the Saudi Arabia Cultural Bureau in the UK, London. Dr. Mansour has published widely in various peer review international journals. He is currently teaching undergraduate and postgraduate courses in Mathematics Education as well as a variety of other courses in Curriculum and Instruction. He is currently supervising master's students who specialize in curricula and methods of teaching mathematics.

Email: dr.malabdulaziz@hotmail.com

ORCID: <http://orcid.org/0000-0002-3890-0341>

Publisher's Note: *The opinions, statements, and data presented in all publications are solely those of the individual author(s) and contributors and do not reflect the views of Universitepark, EDUPIJ, and/or the editor(s). Universitepark, the Journal, and/or the editor(s) accept no responsibility for any harm or damage to persons or property arising from the use of ideas, methods, instructions, or products mentioned in the content.*
