



MINISTRY (BACCALAUREATE-WEZARY) EXAM PREPARATION: IMPLEMENTING THE ZERO MISTAKE PROGRAM IN THE MATHEMATICS COURSE

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Abstract: This article covers the details of the Zero Mistake Program (ZMP) implemented for senior high school students at Stirling Schools in the regions of Iraq and Kurdistan while preparing for the ministry exams (wezary, baccalaureate). As a result of the findings, recommendations, and outcomes obtained during the preparation for these exams, which are a serious issue throughout the country, it has been shown that an easier path can be followed that can save both families and students from a great deal of trouble. Our work was supported by a methodology using both quantitative and qualitative data. The students' grades in mathematics at the end of the year, their mathematics mock exam grades at the end of the ZMP, and the official mathematics exam results they obtained from the ministry exam were compared. Our study was further supported by feedback from the students and their parents who participated in the ZMP. Our research was conducted among 12th-grade students at Erbil Nilufer Girls' High School. In summary, this article's details reveal the successful results achieved through the dedicated efforts of selfless teachers in the ZMP, which marks the culmination of various programs (Figure 2) spread over an academic year.

Keywords: learning environment, math anxiety, mock exam, tutor, zero mistake program (ZMP)

1. Introduction

Reimagining mathematics education or reimagining education for a brighter future would be more inclusive and perhaps more accurate, especially in public and private schools after the pandemic. No matter what the situation is, every child deserves the chance to achieve in a high-quality and well-equipped school. Kurudirek and Berdieva (2024) thoroughly examine the three pillars of education and emphasise that students can benefit more from empowered schools and thus transition into life more effectively. Achieving great success will be a commonplace occurrence if these three pillars (Figure 1) function together effectively.

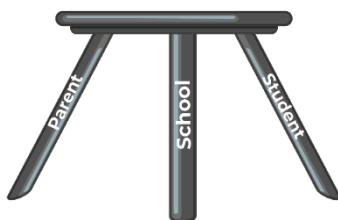


Figure 1. *Tripod in education*

Education is critical in providing humans with the necessary tools to live meaningful and peaceful lives. It is a deliberate and coordinated activity in which both the educator and the learner work toward a specific goal. Various intellectuals, philosophers, and educationists have debated and interpreted

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education's goals, purposes, and ramifications. Educators, politicians, parents, and students agree that mathematical abilities help people succeed in life, including in terms of jobs, money, and professional advancement (Bregant, 2016).

Life and education are inextricably linked. Education is significant to the extent that it serves as a yardstick for measuring a country's growth. A country that possesses high-quality human resources in terms of spirituality, intelligence, and skill can be considered developed. Constant improvement in the field of education, particularly in the area of mathematics, is one strategy that may be used to accomplish this aim (Hasibuan et al., 2018).

Mathematics is a fundamental skill that students must possess to continue their education. We can examine the study by Delan and Bnar (2024) to gain insight into various aspects of the education system in Iraq and Kurdistan, as well as to explore the landscape of general and mathematics education in middle and high schools. This study highlights the main educational themes that emphasize the issues encountered in the school system and the untapped potential. It aims to uncover the complexities of the current state of general and mathematical education in schools.

Bilgin's (2024) research, which claims that many efforts have been made to integrate 21st century skills into the curriculum, illuminates our study by answering the question of which of these skills is more significant than the others. Mathematics education is widely considered necessary for individual development, but many students experience difficulties in developing this subject, leading to frustration and stress. Innovative ways are needed to provide a good learning environment that goes beyond traditional teaching methods.



Figure 2. Stirling Schools, Twelfth-grade programs

In this article, we will discuss the ZMP, which aligns with the topic of our paper and represents the final step of Figure 2. The study investigates strategies such as building positive teacher-student relationships, promoting inclusivity and diversity, encouraging collaborative learning, using real-world applications, differentiating instruction, integrating technology, providing supportive feedback, and creating a growth mindset to provide insights into how secondary schools can establish positive learning environments where students feel empowered. The creation of such positive learning environments not only increases academic accomplishment but also promotes students' overall development, equipping them to thrive intellectually, socially, and emotionally in an ever-changing world.

1.1 The Ministry (Baccalaureate-Wezary) Exam

In several countries, students are required to take the ministry (baccalaureate-wezary) exam under different names to be admitted to a university (Akin, 2012; Al Saud, 2009; Farrokhi-Khajeh-Pasha et

al., 2012; Kusayanagi, 2013; Moreno Olmedilla, 2022; Zhang, 2016). Students must achieve excellent Wezary Exam (WE) scores to gain admission to prestigious institutions and fields. It is competitive, and only a restricted number of students are admitted to famous institutions each year. Mathematics is one of the most significant disciplines covered in the WE. Kurdistan WE's math problems cover subjects such as functions, limits, derivatives, differentiation applications, integrals, and conic sections. In addition, WE has the subject of complex numbers too for Iraq.

The ministry exam is a multiple-choice exam utilized as one of the university admission requirements. In southern cities of Iraq, a classic system is implemented where exams consist of 6 questions, each containing various sub-questions that may not directly relate to the main question. Students are required to answer any 5 out of these 6 questions, allowing them the option to skip one question of their choice. These exams last 3.5 hours, and individuals who fail may retake them in subsequent years until they pass.

Students who do not pass the Wezary exams starting in June (referred to as the first attempt) or cannot take the exam for any reason are given a second chance in August. A third chance is even offered, but this only applies to the southern provinces of Iraq, not the Kurdistan region.

Kurdistan does not follow the typical test logic that is widely known and practiced globally. This implies that there is no penalty for wrong answers or that their use is not allowed. The score for each subject in the Wezary exam is determined by multiplying the total number of correct answers given by the student by 2, resulting in a score out of 100. Students take a multiple-choice exam starting in June, covering seven subjects, with exams being held weekly for just two subjects. The exam begins with biology and ends with physics, interspersed with Kurdish, chemistry, Arabic, mathematics, and English.

Unfortunately, we cannot deny the widespread presence of a memorization-based approach in Iraq and Kurdistan's Wezary exams. Despite the fact that Kurdistan has taken serious steps to generate new and innovative questions for the exams, we cannot yet claim that the desired level has been achieved.

Kurdistan appears to have successfully handled an issue with ease—one that many countries in the Middle East and even around the world have failed to resolve—setting an example for its neighboring countries. In these lands where different nations live, university entrance exams can be conducted on the same day and date in four different languages: Kurdish, Arabic, Syriac, Turkish, and English. Another important aspect of these exams is that the same curriculum is used in schools. This means that everyone can receive education in their mother tongue or, preferably, in chosen language, using the same curriculum. It is commendable to establish a common curriculum to avoid complexity. Even a country as popular as the United States achieved this in 2010 (Wikipedia contributors, 2024).

Statement of the Problem

The main purpose of the study was to examine the relationship between the Zero Mistakes Program (ZMP) and student academic performance, as well as its impact on students and parents.

Rationale of the Study

The inspiration for this study emerged from the idea that ZMP, which has reached a commendable level thanks to the dedicated efforts of teachers from Stirling Schools over a long period and has now become a nationally recognized brand, should adopt an academic identity. The consistent success and national rankings achieved by these educational institutions, which mobilize all resources for the success of their students, served as a source of inspiration. In addition to presenting students with various study programs and setting goals for them, the school administration's support and the entire teaching staff have further enhanced these efforts, prompting this research.

Significance of the Study

The research findings are significant for everyone (students, schools, parents, community, country, etc.) as they suggest that the noteworthy success of 12th-grade students in Wezary exams through the ZMP could seriously impact the role of education for future generations. This study could be even more beneficial for social researchers in reimagining education and investigating the educational achievements of students, starting from the youngest individuals to society and across the country.

Timeliness and Novelty

Although graduating from high school and entering universities in Iraq continues through traditional examination methods, the Kurdistan Region has entered a new era. The transition from the previously implemented classic system to the test-based system has brought both advantages and challenges. Among the foremost difficulties are understanding how to prepare for test-based exams and gaining sufficient access to question resources. In addition to these, the costs associated with preparation centers and private tutors, along with the sociological and psychological challenges faced by both students and their families, highlight the need for a program that can be addressed and implemented within schools, offering a simple and satisfactory solution for everyone.

Through the Zero Mistake Program (ZMP), students are given unique opportunities to achieve success more efficiently by proportionally increasing their effort in their familiar teaching environments. This approach overcomes challenges such as adapting to different peer groups in preparation centers, reconciling various perspectives on topics among students from different schools, difficulties in forming homogeneous classes, or disparities in curriculum alignment. As the test-based system is just beginning to develop in this region, now is the perfect time to share these details with the educational community and establish structures accordingly.

Research questions

1. What is the role of ZMP in students' academic success?
2. What is the impact of ZMP on students and parents?

2. Literature Review

2. 1. Conceptual Framework of ZMP

The Zero Mistake Program (ZMP) is a program rooted in active learning, systematic error correction, and constructivist pedagogical theories. It is designed to enable students to build mathematical concepts through experience and interaction. Grounded in the principles of constructivism, ZMP emphasizes participation in the problem-solving process, enhancing students' engagement with mathematics and providing opportunities to grasp concepts more effectively.

ZMP also incorporates metacognitive strategies, guiding students to evaluate their thought processes, identify errors when encountering challenges, and develop solutions to overcome them. This approach not only enhances problem-solving skills but also naturally boosts academic performance. Additionally, through scaffolding, the program provides gradual support, allowing students to gain confidence, ease, and independence as they transition to more complex topics (Abu Bakar & Ismail, 2020; Amir MZ et al., 2021; Özkubat & Özmen, 2021).

By adopting mastery learning principles, ZMP ensures that students achieve proficiency in foundational skills before advancing to more intricate subjects. This integration of theoretical frameworks equips students to effectively tackle the challenges of preparing for high-stakes exams such as the Wezary. Through these comprehensive strategies, ZMP provides a holistic approach to overcoming academic challenges (Kusmaryono & Rusdiantoro, 2020; Rifah et al., 2024).

2. 2. Factors Influencing Student Success

The existing literature supports and aligns with increasing the importance of programs like ZMP. Firstly, while students are evaluated through traditional written exams in middle and high school, they encounter multiple-choice tests in Wezary and similar university entrance exams (Baştürk, 2003). The Ministry exam is not fully aligned with the middle and high school education processes of the students taking it.

Teachers undoubtedly have a profound and significant impact on students' learning and success (Hattie, 2009), and some teachers are more effective than others in promoting the desired educational outcomes (Atteberry et al., 2015). Identifying the qualities that contribute to teacher effectiveness has been and continues to be critical, with the ultimate goal of improving education. However, was the

intelligence of the teacher truly influential in student success? Studies on indicators of cognitive abilities (Bardach & Klassen, 2020) have found that teacher effectiveness has at most a slight positive correlation with these abilities.

The interaction between teachers and students is important to classroom instruction and significantly increases teaching quality and student progress. The kind and quality of teacher-student interaction forms the foundation for understanding student involvement. Furthermore, it was concluded that teacher-student connections positively impacted student mathematical success (Byiringiro, 2024). Students' performance in mathematics is determined by the intersection of their achievements and attitudes. Therefore, their positive attitudes toward mathematics provide adequate incentives for learning and enhance their performance (Elliott & Bachman, 2018).

Idris et al. (2020) investigated the association between parents' education and their children's academic success, with an emphasis on the educational level of the father and mother. A strong association was established between parents' education and students' academic success. According to study findings, educated moms contribute more to their children's education than educated fathers do. This is because an educated woman's self-esteem as a mother is higher, significantly impacting her children's nutrition and development. A mother is the most critical person in a child's life and may and does impact them in all aspects of life.

2.3. Students' Self-Confidence and Math Anxiety

Self-confidence is the belief in one's ability to complete a task or solve a problem. Fitriani (2015) states that students' success is influenced by their self-confidence, as those with high self-esteem strive for success to develop intellectually. Additionally, Şişman et al. (2011) have revealed that self-confidence affects mathematical reasoning skills.

A student with test anxiety exhibits unfavorable behavioral changes and finds it difficult to concentrate and succeed on exams, even after preparing. Mayer (2008) believes that as long as a student can study and succeed in exams, anxiety is insignificant, regardless of how anxious the student is. However, Ergene (2003) argues that students with exam anxiety respond more strongly to instances of failure, which in turn lowers their self-efficacy. Supporting this claim, Besharat (2003) and Mayer (2008) state that experiencing excessive exam anxiety limits students' social development and causes them to feel uneasy in social interactions. Moreover, these conditions can lead to students losing motivation to attend school.

Research suggests that students' test anxiety might be influenced by irrational beliefs, perfectionism, and external factors, including parental attitudes (Güler & Çakır, 2013; Shadach & Ganor-Miller, 2013). Students' success depends on their parents' attitudes (Yang & Shin, 2008). Among the variables affecting student success are weak family communication (Sapp, 1999), non-democratic parental behaviors (Putwain et al., 2010; Salend, 2011), and exaggerated expectations (Wang & Heppner, 2002). In contrast, Peleg-Popko (2004) argues that close relationships with mothers reduce students' exam anxiety. Nonetheless, because some families do not know how to help their children and are as anxious as they are, they may exacerbate rather than alleviate their worry (Mulvenon et al., 2005).

Math anxiety is a debilitating condition that plagues many students preparing for the university entrance examination. According to neuropsychological research, negative rumination while anticipating arithmetic scenarios significantly exhausts the working memory load and adds to execution anxiety, which impairs learning and performance. Improving the psychological environment in the classroom might boost students' academic success (Samuel & Warner, 2021). Then we can easily say that those who see beauty think beautifully, and those who think beautifully enjoy life.

3. Private Tutor Issue

Private tutoring has grown fast worldwide as people focus more on boosting student accomplishment. However, the data on the impact of private tutoring is inconclusive for educational scholars and policymakers (Zhang, 2013). Throughout our research, this issue has sometimes presented itself in various dimensions. We could also describe it as a dilemma.

Families frequently hire private tutors for reasons such as avoiding responsibility for their children's future, due to it being a common practice, due to social pressure, or out of helplessness. However, having a school and a private tutor reduces the child's performance. This is because students are exhausted from immediately returning home from school without resting and attending private tutoring sessions in the evening. Unfortunately, the lack of a regular schedule or coordination between school and private tutoring puts pressure on the child and their family. While a few students can cope with this intense work, the situations of most students are not at an acceptable level.

Furthermore, it was noted as a separate crisis issue that some students prioritize their private tutors and disregard classes at school. Many students expressed confusion, stating they could not hear the same topic from their school teacher and private tutor. Different teaching approaches and factors, such as experience, come into play here. Several research has attempted to examine the factors that trigger private tutoring and its effects on student academic performance (Bray & Kwok, 2003; Tansel & Bircan, 2006).

Another issue is the period when private tutors disconnect from their students. Although there is still time for the Wezary exam, private tutors who start lessons with new groups for the following year no longer allocate time to their former students and do not answer their questions. At this point, although students may start to experience trauma, they cannot express their dissatisfaction due to reasons such as peer pressure, exam stress and family factors. Therefore, the importance of the statements made by schools during the orientation programs at the beginning of the year to parents becomes evident: "We are not asking you to allocate additional budget for private tutors. Our school will provide all the necessary additional studies and prepare students for the Wezary exam." This approach proves beneficial for all involved. However, overcoming these dilemmas seems to be a time-consuming process.

4. Zero Mistake Program (ZMP)

Stirling schools have a well-established system for administering the Wezary exams through a dedicated team. This approach begins in year 11 with preliminary discussions that consider the students' perspectives. It continues with Wezary test summaries and individual conversations for year 12. During this period, important seminars and information sessions for parents take place. As students approach the completion of their final exams, the school administration announces the experienced teachers who will be teaching the following year, hoping to alleviate students' anxieties. Once they have completed their final exams and have a week off, they begin the thorough process shown in Figure 2. This marathon starts with the summer school and culminates in the ZMP.

In the ZMP, teachers conduct a detailed analysis of students' previous mathematics performance. Therefore, it is crucial to pay individual attention and determine the needs of each student. Instructors have been advised to analyze students' arithmetic antecedents (Tobias, 1990) and provide psychological treatments (Spitzer & Aronson, 2015) to compensate for negative experiences and improve academic mental health.

With this program, students are introduced to advanced test techniques and extensively educated to manage all sorts of questions referred to as traps. The aim is to build immunity through several mock exams, ensure students are well-prepared and well-informed against potential exam pitfalls, gain self-confidence, and overcome math anxiety.

During the year, alongside various tutoring sessions, extra classes, and similar programs (Figure 2) for students, the Zero Mistake program primarily comes into play after completing regular school lessons. The process begins in March and lasts three months, including a general review at school, revision by students, mock processes, second revisions under teacher supervision, and pre-Wezary mocks until the exam period. According to research, students' desire to succeed in mathematics significantly influences their academic performance and career choices. When students are motivated towards a goal that requires academic performance, their self-esteem increases and they quickly understand the importance of mathematics in achieving that goal (Watt et al., 2012).

In this program, morale and motivation play a significant role. Certainly, it is important to recognize that behind the success of this program lies not individuals but the institutional system, with a collective spirit embraced by all school personnel, from teachers to school security and cleaning staff. Moral and motivation-oriented guidance programs developed by schools to prepare students for life and steer them toward success have emerged in response to the needs of modern individuals and have evolved over time (Bilgin et al., 2022). The dedication and commitment at Stirling Schools have created a conducive learning environment, impacting various programs, including the Zero Mistake program.

Participation in the ZMP is entirely voluntary, as it is now time for parents and students to take on a certain level of awareness and responsibility. However, before the program begins, all students and parents who have the potential to participate in the ZMP are informed through various communication channels. This exciting process for parents and students has also started months in advance for the teachers. Together with their respective colleagues, they have been working diligently to prepare special summary lesson notes for the program, original questions, different levels of practical exams to help students rebuild their self-confidence and overcome math anxiety, and mock exams at the level of the Wezary exam. The learning environment has a significant influence on student engagement, motivation, and academic success (Ponnusamy & Perumal, 2023). The significance of the learning environment goes beyond academic achievement.

Education is meant to prepare students for life, and students should complete the necessary work for both internal and external tests as needed. Mock tests forecast students' achievement in external exams and are an important element in the ZMP. Mock tests (Bosson-Amedenu, 2017) are selective, predictive, and diagnostic, offering information about how well the teacher's instructions were understood.

In these schools, students are viewed as two-winged birds and are prepared for life accordingly. The first wing focuses primarily on scientific competence, encompassing the principles of mathematics and science. However, this wing alone is insufficient, which is where the second wing comes into play. This requires developing a learning environment that seamlessly blends pedagogical and guidance strategies to foster overall growth and ensure maturity. As a result, students can fly freely without encountering any obstacles.

4. 1. Technological Support and Flipped Classroom

This century has witnessed several technological and scientific advancements. Changes in these domains significantly impact people's lives (Daskan & Yildiz, 2020). Another important aspect that stands out during the ZMP is that teachers have been observed to bring students closer to technology. Today, technological breakthroughs have caused considerable changes in the sphere of education. Mathematics education, particularly with the introduction of Web 2.0 technologies, has grown more effective and entertaining (Kara, 2023; Saralar-Aras & Hebebe, 2023). Giving students interactive opportunities to solve mathematical problems may make learning more interesting and engaging. They also encourage cooperation and sharing among students, which can help them better comprehend mathematical subjects, like using programs such as Desmos and Mathway.

Innovative ways can shift the paradigm of mathematics education, inspiring instructors to embrace new ideas and experiences. The Flipped Classroom (FC) is an innovative educational technique with the potential to improve mathematics education. While FCs pose some challenges in terms of instruction, well-designed FCs offer excellent opportunities to enhance students' mathematical thinking and understanding (Cevikbas & Kaiser, 2020; Tekin & Emmioğlu-Sarıkaya, 2020).

During the ZMP, the Flipped Classroom concept was impacted and applied, notably during the student-led review process. According to Serin and Khabibullin (2019), face-to-face classrooms have a high potential for students to learn 21st-century skills. It has been stated that there is a wealth of material available in the Stirling Schools pools on this subject. After completing the first part of the ZMP, they used the (FC) technique for the second phase, and we want to underline the importance of this point in the overall achievement. Based on feedback from the ZMP coordinator, it is important to note that serious attention has been given to this aspect.

4. 2. Parents' Role in Children's Academic Achievement

We should immediately state that there is an overwhelming expectation from families in both Iraq and Kurdistan regarding their children. Regardless of the family's economic situation, educational background, or other conditions, this expectation has become almost standard in nearly every family. Specifically, it involves their children passing the Wezary exam and primarily pursuing studies in medicine (general medicine, dentistry, pharmacy, etc.). While this may be an unintended preference for some students, it has generally been observed that there is a parallel consensus between parents and their children on this matter.

Parental expectations are vital for higher education because parents closely monitor and understand their kids' abilities at school, home, and community environments (Dockery et al., 2022). Therefore, parents' perceptions of their kid's potential educational achievement are significantly connected with actual educational outcomes (Pinquart & Ebeling, 2020; Yamamoto & Holloway, 2010). This is due in part to the way parental views of these elements interact to shape their attitudes, beliefs, and actions about their children's educational trajectories. The education of parents has a tremendous impact on children's knowledge, abilities, and values (Muraina & Ajayi, 2011).

Educated parents may also give appropriate assistance to their children since they have previously gone through the educational process and are familiar with the highs and lows of educational decisions. Therefore, they may share educational life experiences, which are quite effective in pushing their children to study. These experiences help individuals shape their behavior and appropriately adapt to their surroundings, resulting in a wealthy and educated life. Harb and El-Shaarawi (2006) state that parental guidance, which includes family interactions such as reciprocal communication, consultation on educational decisions, and sharing educational experiences with children, leaves an indelible mark on children's academic success.

5. Method and Results

5.1. Design of the Study

Quantitative and qualitative research follow-various research paradigms representing the researcher's scientific outlook. As a result, techniques, methods, and outcomes inherently vary (Goertz & Mahoney, 2012; Stahl & King, 2020). This study employed qualitative and quantitative methodologies to examine the data and assess the findings' trustworthiness. This article aims to demonstrate that the implementation of the Zero Mistake Program in the mathematics course, as part of Ministry (Baccalaureate–Wezary) exam preparation, is beneficial to students. It aims to prove that the process is a little bit challenging and that they achieve better results in ZMP. Although it is simple to measure student progress through examinations, watching behavioral changes and psychological consequences of teachings is impossible; thus, student and parent interviews were utilized to monitor these changes, too.

5.2. Ethical Considerations

This research adhered to ethical guidelines, and informed consent was obtained from the students and their parents or legal guardians. The study ensured the anonymity and confidentiality of the participant's responses. Additionally, the study received ethical approval from Tishk International University, Research Ethics Committee (dated 01/11/2023, reference number No:113/Protocol No: 23).

5.3. Sample Selection

Our research was conducted in the A and B branches of the 12th-grade students of Nilufer Girls' High School in Erbil. Thirty students with the same mathematical background were randomly chosen from five classes. The students have willingly agreed to engage in this study. The research ensured that the findings did not have an impact on the students' academic outcomes, therefore there were no difficulties with their performance.

5.4. Procedure and Data Collection

Two groups were formed: control and experimental. There were 30 students in total in these groupings, 15 females in Class A and 15 in Class B. Students in Class A were the control group, while those in Class B were the experimental group. During the 26-week educational period, 5 lessons per week, 40 minutes each, were given for both groups, and all the topics included in the Wezary exam were taught to the students. Some basic information and formulas were additionally provided during the lessons to assist the students. The student's progress during the regular academic school year was monitored. As shown in Figure 2, the Zero Mistake Program is implemented for the experimental group after the completion of regular school lessons. The process begins each year in March and lasts for three months. Before the program begins, both parents and students are thoroughly informed. At this stage, all school staff collectively work to instill a unique sense of morale and motivation in the students. In addition, students are provided with summary notes, original questions, and exposed to practice exams at various levels, including mock exams at the level of the Wezary exam, to help them regain self-confidence and overcome math anxiety.

5.5. Curriculum for Experimental Group

The exact curriculum was also applied to this group because the official exam, which is administered by the ministry, is the same and is held on the same date. In general, the main source for the Ministry exams is the textbook Mathematics for All Grade 12. Once students reach the final stage of Holt Mathematics and Pre-Calculus level, the curriculum is considered complete, and students are tested in the Ministry exam using the questions from these textbooks. However, as the questions in the textbooks no longer fully meet the required level of proficiency, the process has shown that supplementary resources are essential. With the guidance of a competent teacher, additional study materials can lead to success. Students are better prepared for the exam through topic-by-topic analyses of past exam questions, their relative importance, exposure to different types of questions and solution strategies, quizzes, and realistic mock exams.

5.6. Quantitative Data

Quantitative data was collected from two different sources, which are detailed below. These include the results of the mock exams conducted during ZMP and the official ministry (baccalaureate-wezary) exam results administered by the Ministry.

Table 1. *The analysis of pre-test and post-test math exam scores*

Variables	Groups	N	Mean	SD	t	df	p
Pre-test	Control	15	78.67	6.661	2.455	28	.021
Pre-test	Experimental	15	79.53	6.423			
Post-test	Control	15	74.66	10.355	8.651	28	.000
Post-test	Experimental	15	98.13	1.767			

The numerical data in Table 1 shows that students' levels were approximately the same in pre-test scores. In other words, the p-value of .021 is higher than 0.05, which was insignificant. On the other hand, a considerable jump in post-test scores was measured, given the p-value of 0.000, which is less than 0.05. In other words, the average scores of students in the control group decreased by 5 points, while students in the experimental group increased by about 20 points. Thus, it can be stated that ZMP-enriched mathematics education yielded far better results than taking part in lessons based on the official mathematics curriculum. The stark differences are also observed in Figure 3 below.

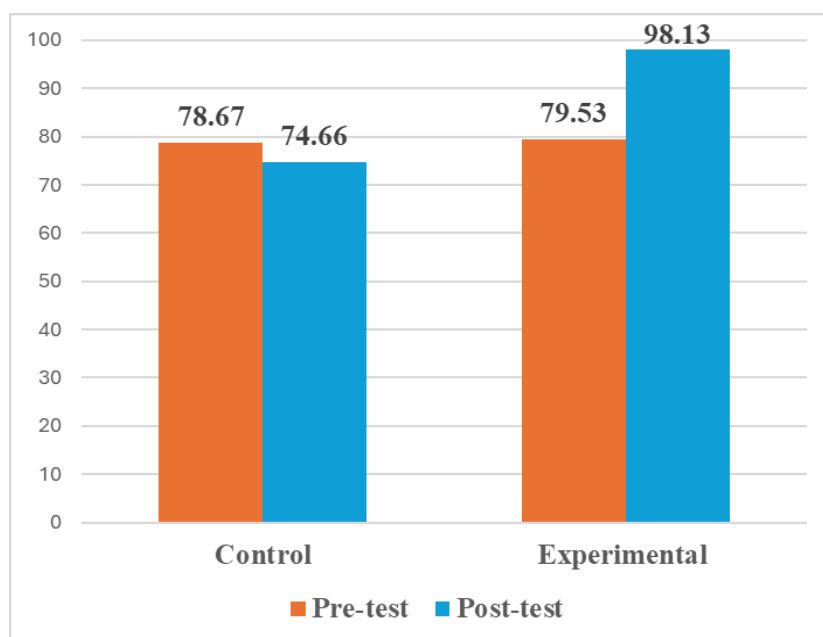


Figure 3. Comparison of Pre- and Post-Test Results

5.7. Qualitative Data

The findings were triangulated through semi-structured interviews to ensure they harmonized without leaving room for doubt. In this sense, the study's efficacy was thoroughly examined.

Participants' responses were organized into eight themes: Student Performance, Teaching Methods, Additional Resources, Learning Environment, Assessment Techniques, Private Tutor, Parent Engagement, and Overall ZMP Impact.

Here is a brief description of the feedback from the Zero Mistake Program (ZMP) study, grouped in a table format for clarity. When Table 2 is reviewed in detail, it becomes evident that using ZMP to prepare for Wezary exams has gotten positive feedback. However, there are several areas for improvement.

Table 2. Themes to reflect participants' feedback on ZMP

Category	Positive Feedback	Areas for Improvement
Student Performance	-Increased problem-solving accuracy. -Gained confidence in math.	Various question types are required to provide a more complete grasp of the test technique.
Teaching Methods	-Improved teacher-student connection. -Encouraged active problem-solving.	Provide teachers with additional ZMP-specific training.
Additional Resources	Students loved the additional worksheets and practice materials.	Request additional digital materials and resources.
Learning Environment	Students described a focused and supportive learning environment.	Specific ZMP classroom designs and supplies may be upgraded.
Assessment Techniques	-Effective in finding and correcting specific faults. -Mock tests have a profound impact.	Use more formative assessments to promote ongoing development.
Private Tutor	Some students benefited from private tutoring.	Private tutoring issues that conflict with ZMP techniques need to be reduced.
Parent Engagement	-Positive remarks on the structured learning technique. -Observable improvements in student results.	A desire for more frequent updates on student progress. -Address minor issues about excessive

	-Developed trust with transparent aims.	reliance on ZMP-specific procedures.
Overall ZMP Impact	-Significant increase in success in the course. -Fostered a growth mindset among students. -Increased trust in school and teachers	Use more participatory and technology-based strategies.

5.8. Course feedback summary

To evaluate the program, feedback from students and parents were requested. Five students in the experimental group and their parents expressed their thoughts and feelings as follows. Based on the interview results obtained from these students, the ZMP is much more beneficial for students. The students also mentioned that this program positively influences their exam success and that they will feel more confident in mathematics and similar subjects.

Student 1: I have a private tutor, but I joined ZMP, believing it would be beneficial, and I was right. ZMP makes life easier by providing help when my tutor does not respond to my messages. I still have questions after our regular sessions, and I appreciate my teachers for their support.

Student 2: ZMP is a well-organized program that offers resources and an environment I would not have had at home. Following my family's advice, I signed up and I am happy with the decision. I recommend it to future students, believe me, you do not need a private tutor.

Student 3: I completed my courses successfully and did not require a private tutor, as my teacher and family advised during orientation. I trusted myself, completed my textbook on time, and then turned to ZMP for additional materials that well exceeded my expectations. My teacher was always ready to answer inquiries, unlike private tutors, who frequently disregarded my friends' calls. I honestly feel like I am in heaven.

Student 4: My biggest issue was a lack of motivation, but ZMP changed that. After school, we studied in a cozy rented house where my teacher guided us, shared advice, solved questions, and even prepared meals like a parent. It felt like private tutoring but with a unique, supportive atmosphere. My teacher also shared insights from past Wezary exams, providing invaluable help. While my family considered hiring a psychologist, I realized my classroom teacher, who knew me best, was better than any professional.

Student 5: I initially had trust issues due to warnings about the difficulty of 12th grade and pressure to hire a private tutor. Despite this, I chose to trust my school and teacher, closing other doors (like a private tutor, etc.) and fully committing to ZMP. My exam stress decreased, and tasks that seemed daunting became manageable. Interestingly, my family still believes I have a private tutor!

When we read the feedback from some parents of students participating in ZMP, we can see how accurate their observations are:

Parent 1: I enrolled my child in these institutions primarily for guidance, trusting they would be raised with the values of our society. With such a dedicated educational program, I feel like I am floating in the clouds. Thank you, Stirling Schools!

Parent 2: We went through the Wezary exam period just like these kids. Due to financial difficulties, I could not hire a private tutor. I had planned to arrange one myself, but the classroom teachers convinced me and my whole family that it was not necessary. It turned out well. After the Wezary exam, I promise the kids a vacation in Turkey.

Parent 3: I am an engineer, and my wife is a teacher. Honestly, I cannot answer my children's questions day and night like the teachers at Stirling Schools do. These dedicated teachers prepare our children for the Wezary exams not just during school hours but also after school and sometimes through residential programs, all without asking for additional fees.

Parent 4: We are a family of doctors, and we believe our child will enthusiastically pursue this profession. We saw the positive impact of the numerous practice exams in the ZMP program, which closely mirrored the actual exam. The progress results from these exams allowed us to predict their score in the real exam. While I have other children, this one is the luckiest, as the others attended

different schools and never had access to such programs. I am now even more convinced that our relatives were right, and that we made the right choice in selecting this school. I strongly believe these types of programs should be expanded and introduced to public schools.

Parent 5: Whenever my child comes home after ZMP, I ask about their day and how things went at school. I noticed that their self-confidence was increasing and their anxiety about math was starting to fade. This is due to the variety of problems and practice exams they solved. My child especially remembers the enjoyment of studying and the conversations in the home environment organized by the school, constantly mentioning the sacrifices made by their teachers. What more can we do than thank Nilüfer School for giving us these opportunities?

Both students and parents welcomed this program because it highlighted the fact that families do not need additional money to pursue their studies and that the school can effectively fulfill its educational duty, resulting in a win-win situation for all. One aspect that we must mention is the following: when we asked participating students for feedback on the ZMP, they all agreed that its benefits were undeniable and expressed their gratitude to their teachers. However, they preferred to wait until after the Wezary exam results were released to publicly share their feedback on social media or in school bulletins or discuss it in more detail at that time. This cautious response seemed to reflect a deeper truth: while no one denied the program's effectiveness, their reluctance to speak out could be attributed to peer pressure, neighborhood influence, or perhaps early signs of exam anxiety. Despite this, all students were satisfied with the ZMP.

5. Discussion and Conclusion

This study addressed questions about the role of ZMP in students' academic success and its impact on students and their parents. The findings are consistent with previous research in the literature that has shown comparable findings.

Although initially designed for implementation in Iraq and the Kurdistan region, the foundational principles and methodologies of ZMP hold significant potential for global mathematics education and empowering schools in terms of education. In regions facing challenges such as exam-focused education, varying levels of student preparedness, and limited resources, ZMP's structured and systematic approach offers solutions, establishing it as a viable model. With its emphasis on deeper comprehension and mastery, the program aims to reduce achievement gaps while fostering a culture of precision and continuous improvement. It equips students with essential 21st-century skills to succeed in high-pressure environments. ZMP's flexibility and high adaptability to diverse cultures further enhance its effectiveness as an educational tool. The program's regional success already demonstrates its capacity to contribute to educational practices on a global scale. In this context, both educators and policymakers can adapt ZMP to their systems, developing innovative and effective interventions. By doing so, ZMP not only enhances individual student and school performance but also makes a significant contribution to mathematics education research, serving as a guiding model for future teaching practices. Kurudirek and Berdieva (2024) underline the importance of education in preparing future generations for success by combining life skills and academics and advocating for empowering schools.

We found significant results on the effects of ZMP on students and parents, which was one of our research questions. These findings are entirely relevant to details about students' psychology. We conducted this research after the 2023-24 Ministry Exams to set the right example for future students. While the program's benefits, participant satisfaction, and the Wezary exam results are separate issues, it is crucial to highlight the program's value to the next generation. Feedback from the teacher who implemented the ZMP emphasizes its positive impact, revealing significant findings. For example, students and families who isolate themselves for after-school study tend to experience more stress. Creating supportive and engaging learning environments that promote self-confidence and positive attitudes towards mathematics is essential for increasing motivation and making success in the Wezary exams more achievable. This finding indicates that there are overlapping aspects with the findings reported by Suren and Kandemir (2020). The educational and pedagogical support provided to

students during the ZMP aligns with Mayer's (2008) findings, which assert that students are not significantly affected by exam anxiety if they increase their effort and dedication to studying.

Another result, as indicated in Figure 1, is that the factors forming the three pillars of education must be in strong communication. In ZMP, which was designed with the support of teachers and schools, it was necessary to involve parents to achieve success in favor of the students, and this was accomplished. According to Idris et al. (2020), while students with highly educated parents may initially perform better academically than those with less educated parents, there is no cause for alarm as long as successful schools and motivated teachers attempt to close the achievement gap. Being successful is never easy, but it is enough for parents in the second group to check their children's involvement in regular activities, especially in the ZMP, which took place throughout the year.

Although in this study we have focused on examining the mathematical aspect of the ZMP, it has been observed that this program is implemented in Stirling Schools across a total of seven subjects in the Wezary exam: Biology, Kurdish, Chemistry, Arabic, Mathematics, English, and Physics. Students have significantly benefited from this program. This article specifically analyzes the impact of the program on the mathematics course.

We have once again confirmed that, in addition to ordinary practices, activities like ZMP that require awareness can undeniably lead to pedagogical and academic progress, thereby strengthening schools and increasing their success. Operating on the principle of thinking big, starting small, and starting immediately, we believe that this program, which has shown results and satisfaction, should not be confined to just one institution. Therefore, we see no reason why this program couldn't be implemented in public schools as well, and we are confident that everyone would benefit. The only exception might be private tutors, whose response to this situation remains to be seen.

Our findings align with those identified by Hattie (2009) and Atteberry et al. (2015), which highlight not only the impact of teachers on students' learning and achievement but also the fact that some teachers are more effective than others. Finally, we underline an identified issue that presents itself as a dilemma. Unfortunately, the country's most advanced and talented young individuals primarily prefer to study medicine or similar fields at universities, while education faculties, which will produce and guide the future, or more specifically, the teaching profession, receive very little recognition. However, both families and students are in search of and striving to receive education from the most successful teachers. This could perhaps be the subject of another article.

Limitations of the study

This study was conducted with a focus on a girls' school in a specific province and involved a limited number of participants. By emphasizing participant diversity, it could also be applied in boys' schools or co-educational schools. The findings can be further generalized by making the necessary comparisons based on factors such as gender differences and age ranges.

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Declarations

Ethical approval was obtained from Tishk International University, Iraq, on 01/11/2023, with reference number No:113/Protocol No: 23.

After the initial draft of the paper was written, it was reviewed for grammar and fluency using the latest version of an AI language model.

Author Contributions

All authors contributed to each part of the research and have read and agreed to the published version of the manuscript.

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