RESEARCH PAPER

Effectiveness of Using Keller's Mastery Learning Strategy in Teaching Social Studies Textbooks and Measuring Its Impact on Developing Geographical Concepts among Basic Stage Students

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Abstract
The study aimed to identify the effectiveness of using Keller's strategy for learning mastery in teaching social studies books and to measure its impact on developing geographical concepts among students in the basic stages. To achieve this, the quasi-experimental approach with a quasi-experimental design was used. The study sample consisted of (75) female students, who were divided into two control groups comprising (35) female students and an experimental group comprising (40) female students, from the fifth grade of primary school to two different departments From one of the schools in Zarqa Governorate in the second semester (2025-2026), where Keller's strategy for learning mastery was taught to the experimental group, and the same content was taught in the usual way to the control group. The results of the study revealed a statistically significant difference between the arithmetic averages of the scores of the students of the two groups in the geographical concepts test, and the difference was in favor of the experimental group. The study recommended generalizing the use of Keller's strategy for masterful learning in teaching social studies, due to its effectiveness in raising the level of academic achievement among students, and training social studies teachers on how to employ Keller's strategy and masterful learning through training programs and educational workshops
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Introduction

The educational process is a dynamic system that aims to bring about positive changes in learners' behavior, knowledge, skills, and attitudes through organized interaction among its various components, including the teacher, learner, content, and learning environment. With the continuous development of the educational field, there has emerged a growing need for modern teaching strategies that ensure effective and sustainable learning, extending beyond memorization and rote instruction toward deep understanding and mastery of knowledge.

Within the efforts of educational institutions to ensure the quality of educational performance, mastery learning strategies have emerged as approaches that enable learners to attain a specified level of performance before progressing to subsequent content. Among these strategies is the approach developed by Fred S. Keller, known as the Personalized System of Instruction (PSI). This strategy is based on dividing content into smaller units that can be mastered more easily, followed by diagnostic assessment and immediate feedback. Learners are not permitted to move to the next unit until they achieve the predetermined mastery criterion. Recent reviews have shown that mastery learning applications contribute significantly to improving students' academic achievement, particularly among those with low initial performance levels, when planning and implementation are carried out effectively (Arumugam & Noor, 2021).

Keller's Mastery Learning Strategy is considered one of the contemporary instructional approaches aimed at improving academic achievement and deepening the learning process. It does so by dividing educational content into manageable units that learners can master before proceeding to the next unit. Recent Arab studies have demonstrated the positive impact of this strategy on enhancing students' motivation toward learning, improving comprehension, and developing thinking skills. Research findings have indicated noticeable improvements in students' performance when this strategy is employed (Tahir & Al-Atrebi, 2023) .Social Studies is regarded as one of the fundamental subjects in basic education, as it contributes to the holistic development of learners by providing them with an integrated understanding of the relationships between humans and their environment, while enhancing their awareness of society and their place within its geographical and cultural framework. The subject also aims to develop geographical concepts, reinforce national and social values, and foster positive attitudes toward the environment and responsible citizenship, thereby linking learners' individual experiences with the world in which they live (Fouiti & Jannad, 2024). Geographical concepts constitute the foundation that enables learners to understand natural and human phenomena and to comprehend the spatial relationships

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and interactions between them. These concepts serve as cognitive tools that help students interpret geographical information and understand their surrounding environment scientifically. They also contribute to building an integrated knowledge base through which students can connect concepts with real-world locations. Consequently, it has become necessary to explore effective teaching methods that facilitate the development of geographical concepts among students in the basic stage. One of the most prominent approaches in this regard is Keller's Mastery Learning Strategy, which takes individual differences into account and allows students to learn at their own pace. Therefore, this study seeks to investigate the effectiveness of using Keller's Mastery Learning Strategy in teaching Social Studies textbooks and to measure its impact on developing geographical concepts among basic-stage students in Zarqa Governorate.

Statement of the Problem and Research Questions

Social Studies is one of the core subjects taught in the basic stage of education. It aims to develop students' knowledge of society, the environment, and spatial relationships, while also enhancing their analytical and spatial thinking abilities. However, educational studies indicate that many students encounter difficulties in understanding geographical concepts. A considerable portion of these difficulties can be attributed to traditional teaching methods commonly used in Social Studies instruction, which often emphasize memorization and rote learning without considering individual differences among students or enabling them to learn according to their own pace.

As a result, there has been an increasing need for modern instructional strategies based on mastery learning, such as Keller's Mastery Learning Strategy, which seeks to enable students to master concepts and skills before progressing to new content while providing continuous feedback and support.

Accordingly, the problem of the study centers on investigating the effectiveness of Keller's Strategy in teaching Social Studies textbooks for developing geographical concepts among basic-stage students and examining its ability to address individual learning difficulties and improve students' cognitive and spatial achievement, thereby contributing to enhanced educational quality and the achievement of mastery-learning objectives.

Based on the study problem, the research seeks to answer the following main question:

Are there statistically significant differences at the significance level ($\alpha = 0.05$) between the mean scores of the experimental group and those of the control group on the Geographical Concepts Test attributable to the teaching method (Keller's Mastery Learning Strategy versus the conventional teaching method?(

Objectives of the Study

-To teach Social Studies using Keller's Mastery Learning Strategy in order to identify its effect on developing students' geographical concepts.

-To investigate the role of Social Studies in developing students' geographical concepts.

Significance of the Study

First: Theoretical Significance

-This study contributes to the educational literature by providing scientific evidence regarding the impact of mastery learning strategies, particularly Keller's Mastery -Learning Strategy, on developing students' skills in Social Studies and enhancing their deep understanding of geographical concepts.

-The study serves as a reference for teachers and educational specialists by providing a scientific framework for implementing modern instructional strategies and demonstrating how mastery learning can reduce individual differences among students and improve academic achievement, thereby enhancing educational quality at the basic stage.

-The study also enriches scientific research in the fields of Social Studies and Geography Education by providing findings that can support the development of curricula based on mastery learning and the creation of more effective learning environments while measuring the impact of modern instructional approaches on students' understanding of geographical concepts and their analytical and spatial abilities.

Practical Significance

The study provides teachers with practical instructional approaches based on Keller's Mastery Learning Strategy, helping them improve students' understanding of geographical concepts and enhance the quality of the teaching-learning process in Social Studies.

The findings may assist curriculum developers in designing Social Studies textbooks that account for individual differences among students and facilitate the application of mastery learning across different grade levels.

The study enables educational administrators and policymakers to develop teacher-training programs aimed at implementing innovative teaching strategies, improving instructional performance, and increasing positive interaction between teachers and students.

It also provides tools and data that can be used to assess the effectiveness of modern teaching methods on students' achievement, thereby supporting educational policies aimed at improving learning outcomes and achieving educational objectives in the basic stage

Terms Definition

Keller's Mastery Learning Strategy is an instructional approach that aims to enable learners to achieve a specified level of mastery in a particular instructional unit before progressing to subsequent concepts or units. The strategy is based on dividing content into smaller, manageable units, accompanied by continuous diagnostic assessments and immediate

feedback to ensure learners' understanding and mastery of the material while allowing them to progress according to their individual pace and abilities (Tahir & Al-Atrebi, 2023).

Keller's Mastery Learning Strategy refers to the set of organized instructional procedures implemented by the teacher in teaching Social Studies textbooks to basic-stage students in Zarqa Governorate. These procedures include dividing content into measurable instructional units, providing immediate feedback following each activity or formative assessment, allowing students to progress at their own pace, offering opportunities for review and support when needed, and utilizing various assessment tools such as practical tests, maps, and applied activities to determine students' mastery of concepts. These procedures are intended to ensure the achievement of instructional objectives and enhance students' academic achievement and spatial knowledge.

Social Studies

Social Studies is an educational field that aims to develop learners' awareness of their society and surrounding environment, enhance their understanding of the relationships between humans and their natural and social environments, and promote cultural and national values, positive attitudes, and responsible behaviors among students, thereby preparing them to participate effectively in their communities and understand their roles within them (Al-Sayed et al., 2025).

Social Studies refers to the organized instructional processes implemented through Keller's Mastery Learning Strategy and specifically designed for teaching Social Studies textbooks to basic-stage students in Zarqa Governorate. These processes include activities and exercises aimed at developing students' understanding of the relationships between humans and their natural and social environments, as well as enhancing cognitive skills related to geographical concepts. The instructional process ensures gradual and thorough mastery of content through continuous assessment and feedback to achieve the intended learning outcomes and improve academic achievement.

Geographical Concepts

Geographical concepts are the set of scientific ideas and principles associated with the study of natural and human phenomena. They enable students to understand spatial relationships between humans and the environment, analyze the distribution of resources and phenomena across the Earth's surface, and comprehend spatial, environmental, and social patterns (Al-Assas et al., 2025).

Geographical concepts refer to the knowledge and skills acquired by basic-stage students through Keller's Mastery Learning Strategy in teaching Social Studies in Zarqa Governorate. These include the ability to identify natural and human phenomena, understand spatial relationships among them, analyze the distribution of resources and geographical features, and use maps and graphs to interpret geographical information. Students' acquisition of these concepts is measured through structured achievement tests and applied activities, which serve as indicators of the effectiveness of Keller's Mastery Learning Strategy in developing geographical concepts.

Basic Education Stage

The basic education stage is the educational phase that generally follows early primary education and extends through the completion of compulsory education. It aims to establish learners' cognitive and skill foundations, develop critical thinking, increase awareness of society and the environment, and foster positive values and attitudes. This stage is considered crucial in building the educational foundation upon which future academic achievement depends, as deficiencies at this stage may negatively affect students' subsequent learning experiences (Abu Khairan & Khalayleh, 2024).

The basic education stage refers to the educational level in which Keller's Mastery Learning Strategy is implemented for teaching Social Studies textbooks to students in Zarqa Governorate. It includes grade levels intended to develop students' cognitive and practical foundations, enhance their thinking, analytical, and problem-solving skills, and strengthen their understanding of geographical concepts. Students' acquisition of knowledge and skills is measured through practical tests and applied activities, allowing the evaluation of the effectiveness of Keller's Mastery Learning Strategy in improving achievement and developing geographical concepts.

Study Delimitations

The delimitations of the study define its scope and specify the boundaries within which the research was conducted. The study was limited as follows:

The study was conducted during the first semester of the 2024/2025 academic year. Additionally, The study was limited to basic-stage schools in Zarqa Governorate, Jordan. The study purposed was to investigating the effectiveness of Keller's Mastery Learning Strategy in teaching Social Studies textbooks and measuring its impact on developing geographical concepts among students in the basic education stage.

Previous Studies

This section presents the most significant Arabic and international studies related to the topic of the current research. The studies are arranged chronologically from the most recent to the oldest.

Buraphadeja and Srisarkun (2024) examined the implementation and impact of mastery learning in a Computer Science course, particularly during the transition from traditional instructional methods to mastery learning amid the COVID-19 pandemic. The

study employed a longitudinal research design and adopted a multidimensional approach to data collection, including student observations, focus group interviews, and comparative analyses of learning outcomes before and after the implementation of mastery learning. The findings provided insights into the challenges associated with implementing mastery learning and highlighted its potential to enhance student engagement and address diverse learning needs, while emphasizing the importance of balancing innovative and traditional teaching approaches. The study contributed to the growing body of literature on instructional strategies in Computer Science education by providing empirical evidence regarding the effectiveness of mastery learning. It also offered important implications for the development of future educational strategies aimed at improving learning experiences in Computer Science and potentially influencing broader educational practices.

Helmy (2024) aimed to investigate the impact of applying Keller's Strategy (Mastery Learning) on improving piano students' performance skills. The researcher adopted an experimental approach and designed a training program based on this strategy, focusing on dividing content into small units, providing diagnostic assessments, and offering continuous feedback, thereby allowing students to progress according to their individual pace and abilities. The study targeted piano students at the Faculty of Specific Education, Tanta University. A sample of students who demonstrated interest and basic piano-playing skills was selected to ensure the effectiveness of implementing the strategy and achieving tangible improvements in performance. The findings revealed a significant improvement in the performance skills of students who participated in the Keller-based training program compared with those who did not receive the training. The study recommended integrating modern learning strategies, such as Keller's Strategy, into piano education programs to enhance learning effectiveness and improve students' performance skills.

Damen (2023) sought to examine the effectiveness of mastery learning in enhancing academic self-efficacy among first-year secondary school students in Geography. The study sample consisted of 78 students from Al-Qantara Sharq Secondary School, divided into a control group (39 students) and an experimental group (39 students). The study instruments included a mastery learning program for Geography achievement and an academic self-efficacy scale developed by the researcher. The results indicated statistically significant differences between the control and experimental groups in the post-test scores of academic self-efficacy dimensions in favor of the experimental group. Furthermore, no significant differences were found between the post-test and follow-up measurements for the experimental group regarding the dimensions of initiative and effort, whereas significant differences were found in the perseverance dimension.

Abbas (2022) investigated the effectiveness of applying Kagan Structures Strategy in teaching Social Studies to fourth-grade visually impaired students, aiming to develop conceptual understanding and imagination skills. The researcher employed a quasi-experimental design with a single-group approach and implemented an educational program based on Kagan Structures with a sample of 15 visually impaired students from Al-Nour School for the Blind in Minya Governorate. A teacher's guide and a student textbook for the first unit of the Social Studies curriculum, entitled *"Nature in My Country,"* were developed according to Kagan Structures Strategy. The results demonstrated statistically significant differences between students' pre-test and post-test scores on the conceptual understanding test and imagination skills scale in favor of the post-test application. The study recommended integrating innovative instructional strategies, such as Kagan Structures, into educational programs for visually impaired students to enhance their cognitive and creative skills and promote their active participation in the learning process.

Udoh and Akpan (2022) examined the effect of mastery learning instructional design and practical learning strategies on the academic achievement of junior secondary school students in Social Studies within public secondary schools in Akwa Ibom State. A quasi-experimental design with control groups and pre- and post-testing was employed. The study involved 270 students and 18 Social Studies teachers from nine selected schools across Uyo, Eket, and Ikot Ekpene senatorial districts. Pre-test results indicated that students in the mastery learning group achieved the highest initial academic performance (M = 51), followed by the practical learning strategy group (M = 49), while the control group recorded an average of 47. The findings revealed no statistically significant gender differences in post-test scores. The study concluded that mastery learning strategies significantly enhance academic performance, student engagement, and instructional effectiveness. It recommended integrating mastery learning strategies into Social Studies curricula to improve academic outcomes in Akwa Ibom State.

Winget and Persky (2022) reviewed the concept of **Mastery Learning** and provided recommendations for its implementation within competency-based curricula. Mastery learning was originally developed during the 1960s to ensure that all students achieve a specified level of mastery or competency. Under this model, students acquire the necessary knowledge, skills, and attitudes and then complete formative assessments. Students who achieve the required mastery level progress to enrichment activities, whereas those who do not meet the criterion participate in corrective activities followed by reassessment. Evidence suggests

that students taught through mastery learning models outperform those in non-mastery instructional settings, with a moderate effect size. Improved performance is attributed to several theoretical factors, including motivation, assessment practices, and feedback mechanisms. The study recommended updating mastery learning models for application in pharmacy education through increased use of cumulative assessments and the evaluation of essential knowledge and skills. It also suggested employing successive relearning models to enhance the effectiveness of mastery learning.

Okewole and Gbadegesin (2021) investigated the impact of a mastery learning instructional strategy on the academic achievement of lower primary school students in Social Studies in Ife Central Local Government Area, Osun State. The study also examined the influence of gender and school type on academic achievement. A quasi-experimental pre-test/post-test control-group design was employed. The study sample consisted of 53 second-grade primary students selected through a multistage sampling procedure. Two schools were randomly selected, with one assigned to the experimental group (public school) and the other to the control group (private school). The researchers utilized the *Social Studies Mastery Learning Test (SSMLT)*, which included demographic information and a ten-item multiple-choice achievement test. The findings revealed that mastery learning had a statistically significant effect on students' academic achievement in Social Studies ($F = 17.317$, $p < .05$). No significant effect of gender on achievement was found ($F = 0.910$, $p > .05$). However, school type showed a significant interaction with mastery learning and achievement outcomes. The study concluded that mastery learning is an effective and innovative instructional strategy capable of improving academic achievement among lower primary school students in Social Studies.

Abu Mansour (2021) investigated the effect of Keller's Mastery Learning Strategy on the development of higher-order achievement levels and knowledge retention among first-year secondary school female students in Arabic Language. The study adopted a quasi-experimental design. An achievement test consisting of 20 multiple-choice items was developed and validated. The sample consisted of 60 female students from Al-Raqeem Secondary School for Girls, selected purposively and randomly assigned to two groups: an experimental group (30 students) taught using Keller's Mastery Learning Strategy and a control group (30 students) taught through conventional methods. The results revealed a significant effect of Keller's Strategy on developing higher-order achievement levels—analysis, synthesis, and evaluation—as well as knowledge retention, in favor of the experimental group.

Distinctive Features of the Current Study Compared with Previous Studies

The current study differs from previous studies in several respects:

-It focuses on the application of Keller's Mastery Learning Strategy in teaching Social Studies textbooks to basic-stage students in Zarqa Governorate. This distinguishes it from most previous studies, which concentrated on secondary education or other subjects such as Arabic Language and Computer Science, thereby providing deeper insight into the effectiveness of the strategy during the early stages of education.

-The study seeks to measure the impact of the strategy on the development of geographical concepts, an aspect that has received limited attention in previous research. Most earlier studies focused primarily on general academic achievement or higher-order thinking skills without specifically addressing spatial and geographical cognitive abilities.

-The study employs a practical and systematic instructional program specifically designed to implement Keller's Strategy, along with diverse assessment tools, including performance tests and applied activities, allowing for the collection of accurate and objective data regarding the strategy's effect on students' achievement and spatial understanding.

-The study aims to provide an applicable instructional model that can be utilized in basic schools to enhance students' geographical understanding. This offers direct practical value and addresses a noticeable gap in the literature concerning the effectiveness of mastery learning in Social Studies instruction.

Methodology and Procedures

Research Method

The researchers employed a quasi-experimental design, which is considered appropriate for this type of study. The design involved two groups: an experimental group and a control group. This approach was utilized to analyze the theoretical literature and the data collected from the educational field in order to investigate the effectiveness of Keller's Mastery Learning Strategy in teaching Social Studies textbooks and to measure its impact on developing geographical concepts among students in the basic education stage.

Population and Sample of the Study

The study population consisted of all basic-stage students enrolled in public schools in Zarqa Governorate during the current academic year and studying Social Studies in schools affiliated with the Directorate of Education in Zarqa Governorate. This population represents the target group through which Keller's Mastery Learning Strategy can be implemented in teaching Social Studies. The population was selected due to the importance of the basic education stage in establishing students' cognitive and skill foundations, particularly in the development of geographical concepts.

The study sample consisted of (75) female students from the fifth grade. The participants were divided into two groups: a control group consisting of (35) students and an experimental group consisting of (40) students from two different classes in one of the schools in Zarqa Governorate. The sample was selected using a simple random sampling technique.

Study Instruments

To achieve the objectives of the study, two instruments were developed. The first was a Geographical Concepts Test, while the second was a Spatial Awareness Scale. These instruments were developed after reviewing the relevant literature and previous studies related to the research topic. The procedures for establishing their validity and reliability are described below.

Achievement Test

To achieve the purpose of the study, an achievement test was developed to assess students' acquisition of geographical concepts included in the Geography Unit of the fifth-grade Social Studies textbook (second semester). The development process involved conducting a content analysis of the unit, constructing a table of specifications, and preparing the initial version of the test, which consisted of (20) multiple-choice items.

Validity of the Achievement Test

The initial version of the test was reviewed by a panel of ten experts and specialists in Social Studies curricula and instructional methods. They were asked to evaluate the suitability of the test for fifth-grade students, the linguistic formulation of the items, and the clarity of the questions. The experts were also invited to suggest modifications, additions, or deletions. Revisions were made based on the consensus of at least 80% of the reviewers.

Reliability of the Achievement Test

To ensure the reliability of the achievement test, the test–retest method was employed. The test was administered and then re-administered two weeks later to a group of (20) students outside the study sample. Pearson's correlation coefficient was calculated between students' scores on the two administrations, yielding a coefficient of (0.92). In addition, internal consistency reliability was calculated using the Kuder–Richardson Formula, which produced a reliability coefficient of (0.89). These values indicate a high and acceptable level of reliability for the purposes of the study.

Item Difficulty and Discrimination Indices of the Geographical Concepts Test

To determine the difficulty and discrimination indices of the achievement test items, the test was administered to a pilot sample outside the original study sample. The percentage of students who answered each item correctly was used as the difficulty index, while the difference between the proportions of correct responses from the upper and lower groups was used to calculate the discrimination index. Table (1) presents the results.

Table 1
Difficulty and Discrimination Indices of the Achievement Test

Item No.	Difficulty Index	Discrimination Index	Item No.	Difficulty Index	Discrimination Index
1	.65	.52	13	.72	.69
2	.78	.68	14	.75	.72
3	.82	.69	15	.58	.53
4	.79	.73	16	.73	.67
5	.82	.74	17	.66	.60
6	.77	.72	18	.79	.75
7	.76	.72	19	.80	.74
8	.80	.76	20	.77	.76
9	.82	.76	—	—	—
10	.73	.71	—	—	—

The results shown in Table 1 indicate that the item difficulty and discrimination indices fall within acceptable ranges, making the test suitable for use in the present study.

Study Variables

The study included the following variables:

Independent Variable

Teaching strategy with two levels:

- Keller's Mastery Learning Strategy.
- Conventional teaching method.

Dependent Variable

Students' scores on the Geographical Concepts Test in Social Studies.

Statistical Analysis

-To test the study hypotheses, appropriate statistical procedures were conducted using the Statistical Package for the Social Sciences (SPSS). The following analyses were employed:

-Means and standard deviations were calculated for students' scores on the Geographical Concepts Test.
-One-Way Analysis of Covariance (ANCOVA) was performed to determine the significance of differences between the adjusted mean scores of the study groups on the Geographical Concepts Test.

Results and Discussion

To answered the following research question.Are there statistically significant differences at the significance level ($\alpha = 0.05$) between the mean scores of the experimental group and those of the control group on the Geographical Concepts Test attributable to the teaching method (Keller's Mastery Learning Strategy versus the conventional teaching method)?
To verify the equivalence of the experimental and control groups on the achievement test prior to the implementation of the study, an independent-samples t-test was conducted. The results are presented in Table 2.

Table 2 Independent-Samples t-Test Results Comparing the Experimental and Control Groups on the Pre-Achievement Test

Group	N	Mean	SD	t-value	df	Sig.
Experimental	35	5.66	3.04	-1.809	73	.075
Control	40	7.28	4.46			

Maximum score = 20

Table 2 indicates that the calculated t-value was (-1.809), which was not statistically significant at the significance level of $\alpha = .05$. This result indicates that there were no statistically significant differences between the experimental and control groups on the pre-achievement test, confirming the equivalence of the two groups prior to the intervention.
To answer the research question, means and standard deviations were calculated for both groups on the post-achievement test. An independent-samples t-test was then conducted to determine whether significant differences existed between the two groups. The results are shown in Table 3.

Table 3 Independent-Samples t-Test Results Comparing the Experimental and Control Groups on the Post-Achievement Test

Group	N	Mean	SD	t-value	df	Sig.
Experimental	35	19.06	2.06	10.004	73	.000*
Control	40	9.63	5.23			

Maximum score = 20
Statistically significant at α = .05.

Table 3 shows that the calculated t-value was (10.004), which is statistically significant at the significance level of $\alpha = .05$. This finding indicates the existence of statistically significant differences between the experimental and control groups on the post-achievement test. The mean score of the experimental group was (19.06), compared with (9.63) for the control group.
In addition, means and standard deviations for both groups were calculated, and a One-Way Analysis of Covariance (ANCOVA) was conducted to examine differences between the groups on the post-test while controlling for pre-test scores. The control group was taught using the conventional teaching method, whereas the experimental group was taught using Keller's Mastery Learning Strategy.

Table 4 Means and Standard Deviations of the Pre-Test and Post-Test Scores for the Experimental and Control Groups

Teaching Method	N	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD
Keller's Strategy (Experimental Group)	35	5.66	3.04	19.06	2.06
Conventional Method (Control Group)	40	7.28	4.46	9.63	5.23

Table 4 reveals apparent differences between the post-test mean scores of the experimental and control groups. To determine whether these differences were statistically significant, ANCOVA was performed. The results are presented in Table 5.

Table 5 ANCOVA Results for the Experimental and Control Groups on the Post-Test

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared (η^2)
Pre-test	815.602	1	815.602	148.419	.000*	.661
Teaching Method	2096.114	1	2096.114	381.440	.000*	.810
Error	395.659	72	5.495			
Total	17628.000	75				

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared (η^2)
Corrected Total	2871.947	74				

$R^2 = 0.858$

Statistically significant at $\alpha = .05$.

Table 5 indicates that the F-value for the teaching method was (381.440), which is statistically significant at $\alpha = .05$. This finding demonstrates a statistically significant effect of Keller's Mastery Learning Strategy on students' achievement in Social Studies. The experimental group achieved a mean score of (19.06), whereas the control group achieved a mean score of (9.63).

To determine the contribution of Keller's Mastery Learning Strategy to students' achievement, the effect size was calculated using Eta Squared (η^2), which yielded a value of (.810). This large effect size indicates that the strategy had a substantial impact on improving students' achievement scores. Furthermore, the coefficient of determination (R^2) was calculated and reached (.858), indicating that Keller's Mastery Learning Strategy accounted for approximately 85.8% of the improvement in students' achievement scores on the Geographical Concepts Test.

Adjusted means were also calculated to identify the direction of the differences between the groups, as presented in Table 6.

Table 6 Adjusted Means and Standard Errors of the Achievement Test Scores for the Experimental and Control Groups

Teaching Method	Adjusted Mean	Standard Error
Keller's Strategy (Experimental Group)	19.804	.401
Conventional Method (Control Group)	8.972	.375

The results presented in Table 6 indicate that the differences in students' achievement scores favored the group taught using Keller's Mastery Learning Strategy.

Discussion of Results

The superiority of the experimental group may be attributed to the educational characteristics of Keller's Mastery Learning Strategy. The strategy takes individual differences among learners into account and provides students with sufficient time to master instructional content before progressing to new topics. This contributes to a cumulative and systematic learning process and prevents students from moving to new concepts before adequately understanding previous ones.

The results may also be explained by the learner-centered nature of Keller's Strategy. Students assume greater responsibility for their learning through self-paced instruction, which enhances motivation, engagement, and participation in learning activities. Consequently, students develop a deeper understanding of the content rather than relying solely on memorization, leading to improved achievement and mastery of geographical concepts.

Another explanation for the experimental group's superior performance lies in the formative assessments and continuous feedback incorporated within Keller's Strategy. These elements enable students to identify their strengths and weaknesses immediately and address learning difficulties before they accumulate. Furthermore, requiring students to achieve a specified level of mastery before progressing to subsequent units strengthens retention and promotes higher levels of understanding.

The findings also suggest that Keller's Strategy is more effective than conventional instruction in improving academic achievement. By emphasizing mastery of learning objectives before introducing new content, the strategy reinforces geographical concepts and minimizes learning gaps that may negatively affect achievement.

Additionally, the strategy provides a learning environment that accommodates individual differences, allowing students to learn at their own pace while receiving ongoing feedback and repeated assessment. This process enhances comprehension, promotes deeper learning, and contributes to more sustainable educational outcomes.

The effectiveness of the strategy may further be attributed to its emphasis on self-directed learning and learner responsibility, which increases students' motivation and active participation in the learning process. Moreover, dividing instructional content into smaller, sequential units facilitates understanding and makes learning more organized and manageable.

Finally, Keller's Strategy contributes to developing geographical concepts by simplifying abstract concepts, spatial relationships, and geographical phenomena through structured instructional units. Continuous feedback and repeated assessment help students correct misconceptions, strengthen understanding, and improve their ability to retain and apply geographical knowledge in various educational contexts.

Recommendations

Based on the findings demonstrating the superiority of students who learned through Keller's Mastery Learning Strategy, the following recommendations are proposed:

1. Generalize the use of Keller's Mastery Learning Strategy in teaching Social Studies due to its demonstrated effectiveness in improving students' academic achievement.
2. Provide training programs and professional development workshops for Social Studies

teachers on the effective implementation of Keller's Strategy and mastery learning principles.
3. Integrate mastery learning principles into school curricula by designing instructional activities and assessments that ensure mastery before students progress to new content.
4. Reorganize Geography content into progressive instructional units that allow students to master fundamental concepts before moving to more complex concepts.
5. Develop instructional guides and supporting educational materials that assist teachers in effectively implementing Keller's Strategy in classroom settings.
6. Conduct further research to investigate the impact of Keller's Mastery Learning Strategy on other educational variables, such as critical thinking, retention of learning, motivation toward learning, and attitudes toward Social Studies.

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