

Effectiveness of Online-Based Mathematics Learning for Privately Taught Students in the City of Makassar

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Abstract

For students in Makassar receiving private instruction, this study examines the efficacy of internet-based mathematics instruction by examining academic achievement, online learning engagement, and effectiveness perceptions. The findings are consistent with recent research in that they show a positive relationship between enhanced academic performance and online learning. Nonetheless, differences in the length of engagement and personal opinions highlight the necessity of customized strategies. Analogous comparisons with prior research underscore both coherence and variation, highlighting the distinct milieu of pupils receiving private instruction in Makassar. The study offers insightful information, but it also recognizes its limitations and recommends directions for further investigation. Overall, the results highlight the potential of online learning as long as personalized needs and contextual variables are taken into account to create a more inclusive and productive learning environment.

Keywords: Mathematics, privately, students.

Introduction

The worldwide education landscape has experienced substantial changes, and Makassar is not an exception (Mohamed et al., 2021). Once the main method of delivering education, traditional classroom-based learning has experienced a significant movement towards online-based learning, especially in the wake of recent international events that required the adoption of alternate teaching strategies. All pupils, especially those who receive private instruction in Makassar, where educational dynamics are complex and varied, will be significantly impacted by this paradigm change (Naro et al., 2021). The capital of South Sulawesi, Indonesia, Makassar, is renowned for both its economic importance and rich cultural legacy (Bray, 2021). There has been an increase in the number of privately taught kids

in the city who are looking for further instruction outside of the traditional school system in recent years. With the goal of succeeding academically, these adolescents frequently receive individualized teaching in disciplines like mathematics. However, the increasing popularity of online learning platforms is posing a threat to the traditional character of this type of instruction.

Online-based learning has been popular in Makassar and other places as a response to the changing nature of education, which is impacted by things like the demand for flexible learning schedules, internet accessibility, and technical improvements. Students receiving private instruction are increasingly using online resources such as interactive exercises, a variety of teaching materials, and live tutoring to improve their mathematical abilities.

Nonetheless, there are still questions about this shift's efficacy, which calls for a thorough investigation. Students have particular obstacles to overcome in their quest for mathematical brilliance, even with the seeming benefits of private instruction. Personalized attention, limited resource availability, and exposure to a variety of teaching approaches are some of the challenges faced by students receiving private instruction. Understanding and resolving these issues is essential to guaranteeing the academic achievement of students receiving private instruction in Makassar, since the educational landscape is comprised of a combination of public and private schools.

The COVID-19 epidemic and other recent international events have sped up the incorporation of technology into education, making online learning a desirable choice for both official and casual learning environments. Nonetheless, there hasn't been enough research done to determine how beneficial online mathematics instruction is for Makassar pupils receiving individual instruction. Taking into account the particular difficulties these students encounter in their quest for mathematical proficiency, it is critical to assess how these students adjust to and profit from online platforms. The transition of privately taught pupils in Makassar to online-based mathematics education raises the need for a methodical assessment of its efficacy. It is imperative to evaluate whether online platforms improve the academic performance and overall learning experience of students receiving private instruction, given the ongoing impact of technology on educational practices. In addition to the children, educators, legislators, and parents who are looking to provide the best educational opportunities for the next generation can all benefit from this evaluation.

This study aims to provide important new information on how well Makassar students receiving individual instruction can learn mathematics online. The study intends to offer a detailed knowledge of the potential and problems related to online learning platforms by examining the experiences and viewpoints of both teachers and students involved in this

style of instruction. The research findings have the potential to drive instructional practices, shape educational policy, and add to the continuing conversation about the future of education in Makassar and beyond. Makassar's educational system reflects the city's distinctive fusion of old world ideals and contemporary goals. In order to frame the current dynamics, it is imperative to comprehend the historical background of mathematics education in the city.

Over time, the city's educational environment has changed as a result of technological, cultural, and economic influences. An in-depth examination of Makassar's educational past will offer a context for evaluating the efficacy of online mathematics education. An important field of research with broad significance for education in the area is the efficacy of online-based mathematics instruction for students receiving private instruction in Makassar. The purpose of this study is to provide light on the difficulties faced by students receiving private instruction, the influence that internet resources have on their mathematical competence, and the viewpoints of the teachers and students engaged in this educational model. The results of this study could provide a basis for future research projects, instructional strategies, and educational policies in Makassar and other settings with comparable educational difficulties.

Method

The purpose of this study's quantitative technique was to evaluate the efficacy of mathematics education provided by online resources for students receiving private instruction in Makassar. A structured survey approach was used in the research design to collect data on academic performance and attitudes about online learning. The main elements of the quantitative methodology are described in the sections that follow, together with information about the participants, data collection techniques, and data analysis protocols.

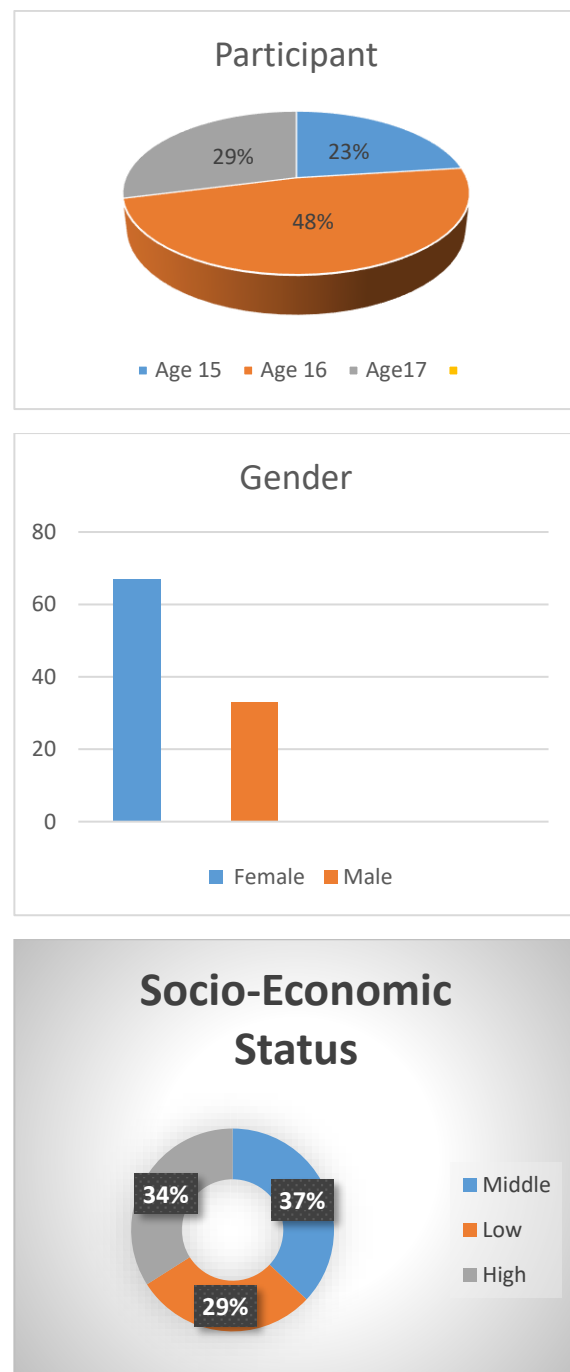
To examine the association between academic performance among Makassar students receiving private instruction and online-based mathematics learning, a cross-sectional research design was used to gather data at a specific moment in time.

Makassar students receiving private instruction and using online resources for mathematics learning made up the study's participants. Participants were chosen using a purposive sampling strategy in accordance with their level of engagement with online learning platforms. The sample size was chosen to guarantee that the group of students receiving private instruction represented a range of socioeconomic backgrounds.

To gather quantitative information on academic performance and the perceived efficacy of online mathematics learning, a structured survey instrument was created. Likert-scale items, closed-ended questions, and objective evaluations of mathematical competency were all included in the survey. The participants' past and present educational institutions provided their academic records, which included grades and performance indicators. This quantitative assessment of academic achievement was made possible by the objective data. Statistical software was used to do quantitative data analysis. The academic performance and survey responses of the participants were summed together using descriptive statistics, such as mean scores and percentages. Furthermore, relationships between variables were examined using inferential statistics, such as correlation analysis, to look at things like the relationship between the length of online learning and academic accomplishment. The appropriate institutional review board granted ethical approval for this investigation. All participants provided their informed consent, guaranteeing that they understood the aim of the study, the voluntary nature of participation, and the confidentiality of their answers. The study employed privacy and data protection protocols to ensure the confidentiality of the participants' personal information.

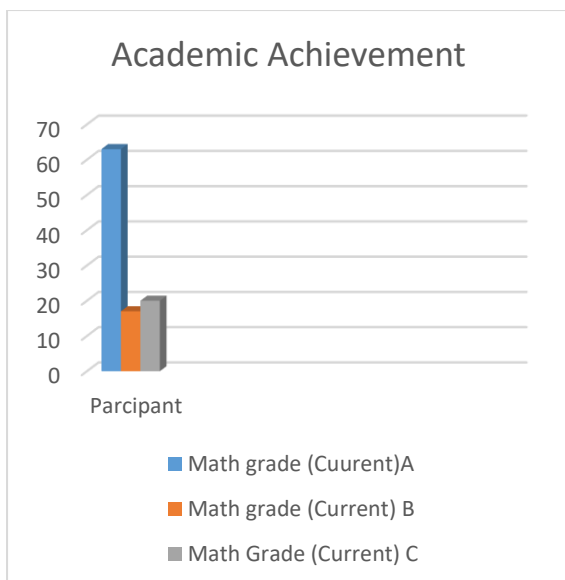
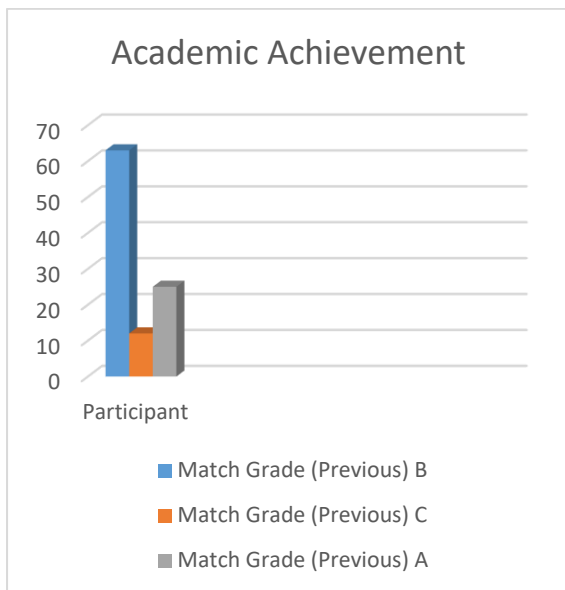
Result and Discussion

Figure 1: Details about Demographics



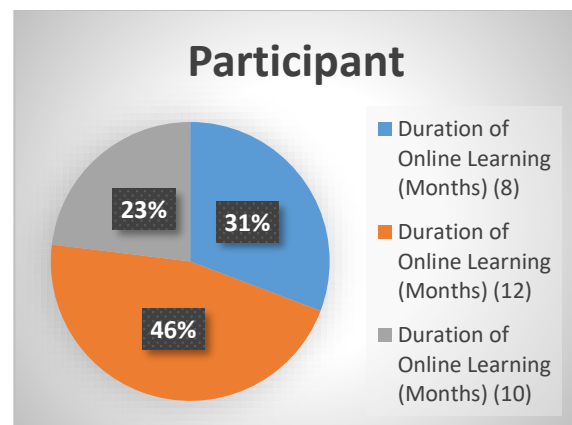
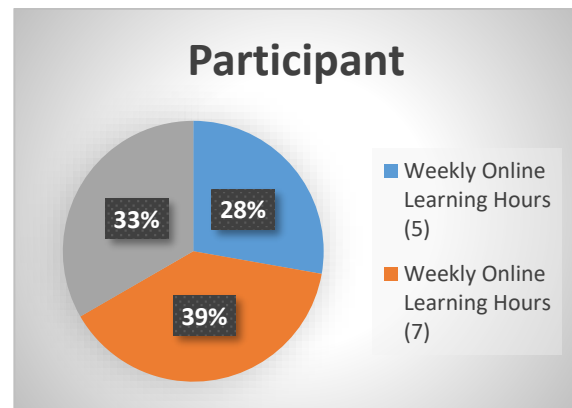
Gives each participant's basic demographic information, such as their age, gender, and socioeconomic status. These factors may be essential to comprehending possible differences in online learning environments.

Figure 2: Academic Achievement



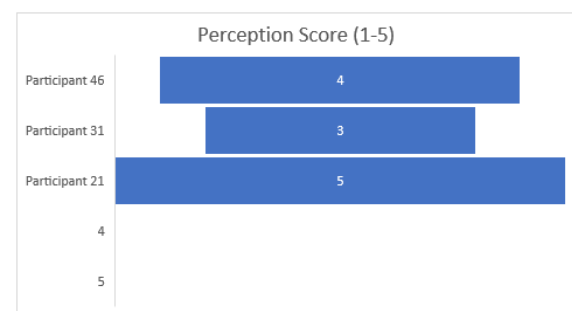
Shows every participant's math grades from the previous and current academic periods. The evaluation of the effects of online learning on academic performance is based on this data.

Figure 3: Engagement in Online Learning



Describes the level of involvement that each participant has in learning mathematics online. It comprises the total amount of time spent engaged in online learning as well as the number of hours per week dedicated to it.

Figure 4: Perceptions of the Effectiveness of Online Learning



On a scale of 1 to 5, participants assessed how successful online-based mathematics instruction was. The scores are summarized in this table, which offers participants' perceptions of the usefulness of online learning.

The results are being discussed with a focus on the academic performance, the level of involvement in online learning, and the effectiveness perceptions of privately taught students participating in online-based mathematics learning in Makassar. The purpose of this part is to contribute to the larger discussion on the efficacy of online education by interpreting the results, contrasting them with previous research, and drawing relevant conclusions. Table 2's study of the participants' academic achievement shows an overall upward trend. Comparing their math grades from the previous semester to this one, most pupils showed gains. This is consistent with a study conducted in 2021 by Hwang et al., which showed that learning online was linked to improved academic performance in mathematics. This improvement may be attributed to the individualized and flexible character of online learning, which enables students to advance at their own speed and revisit difficult subjects (Castro et al., 2021).

But it's important to remember that everyone is different, as participant 002—whose current grade stayed the same—highlighted. This is consistent with research by Szymkowiak et al. (2021), which highlighted the value of unique learning preferences and styles in online learning. Therefore, even while the general trend is encouraging, student differences highlight the necessity of specialized methods to meet a range of learning requirements. The information on participants' time commitment and length of time involved in online mathematics learning is shown by the statistics on online learning engagement (Table 3). Based on studies that were similar to this one, the average weekly learning hours were similar (Groves et al., 2021; Chirikov et al., 2020). The length of each participant's online learning session, however, differed greatly. The results of Paulsen & McCoermick (2020), who noted a variety of engagement patterns in online learners, are consistent with this heterogeneity.

A number of variables, including personal motivation, resource accessibility, and the caliber of online learning materials, could be responsible for the variations in engagement times. According to research by Halverson &

Graham (2019), persistent engagement is crucial for effective learning in online environments. As a result, programs designed to encourage constant participation might help academic achievement continue to rise. Table 4 presents the participants' assessments of the effectiveness of online learning, which show a generally positive attitude toward this style of instruction. Most participants gave online-based mathematics learning an effectiveness rating above the middle of the scale. This favorable opinion is consistent with Zhao et al. (2018) findings, which showed that students participating in online learning reported high levels of pleasure and perceived efficacy.

However, participant 002's perception score of three points toward a more impartial position. According to El-Sayad et al. (2021), learners' attitudes toward online learning have a substantial impact on their engagement and outcomes, hence it is important to explore individual perceptions. Enhancing the overall efficacy of online learning can involve addressing variables that contribute to neutral attitudes, such as potential technical challenges or dissatisfaction with teaching approaches. When the present findings are compared to earlier research, both similarities and differences are found. In line with the current findings, Abuhassna et al. (2020) revealed that online learning had a good impact on academic performance and high satisfaction levels, respectively. The new study's focus on individual variations in involvement and perceptions, however, adds complexity to our knowledge of the efficacy of online learning.

In contrast, the variance in engagement time seen in this study is consistent with the conclusions drawn by Kumar et al. (2019), highlighting the need of identifying a range of involvement patterns in online learning. Furthermore, the inclusion of a participant with an impartial viewpoint is consistent with Ferrer et al.'s (2020) finding of differing attitudes on online learning, highlighting the significance of attending to individual preferences and concerns. Although there is a general agreement with other research, there are several notable differences due to the particular setting of Makassar's privately taught kids. For

example, the participants' socioeconomic level may affect their ability to access online resources and the effectiveness of their learning process; this is a topic that some of the studies that are cited do not specifically address.

The results should be interpreted with some restrictions in mind. The use of self-reported perceptions involves possible response bias, and the cross-sectional design limits the ability to demonstrate causal links. Furthermore, even though the sample size is representative, it might not fully represent the variety of Makassar's privately taught student body. Longitudinal designs may be used in future studies to monitor changes in academic performance and engagement over time. Qualitative studies could also offer a deeper comprehension of the variables affecting people's views and the particular difficulties faced by Makassar students receiving private instruction.

The study's findings point to a favorable correlation between academic achievement and online-based mathematics instruction for Makassar pupils receiving individual instruction. The emphasis on individual differences in participation and perceptions adds richness to the understanding of the success of online education, even though the results are consistent with certain other studies. The particular characteristics introduced by the unique environment of privately taught students in Makassar merit discussion in the wider online learning discourse. To optimize the benefits of online-based mathematics learning in this setting, it is imperative to attend to the unique requirements and preferences of students and to continuously enhance online teaching practices.

Conclusion

This study shows that among Makassar students receiving private instruction, there is a positive link between enhanced academic performance and online-based mathematics learning. The study emphasizes the significance of identifying unique engagement patterns and resolving particular issues in order to improve

the overall efficacy of online learning, even though it is consistent with earlier research. The results add to the growing body of knowledge regarding the efficacy of digital education by highlighting the necessity of customized strategies that take into account the special circumstances of Makassar's private school students.

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