Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

East African Journal of Health and Science
eajhs.eanso.org
Volume 6 Issue 2, 2023
Print ISSN: 2707-3912 | Online ISSN: 2707-3920
Title DOI: https://doi.org/10.37284/2707-3920

EANSO
EAST AFRICAN NATURE & SCIENCE ORGANIZATION

Original Article

Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda

Kirabo Nkambwe Nakasiita[1], David Olema[2], Ali Baguwemu[1] & Henry Kibedi[1]*

[1] Kyambogo University, P. O. Box 1, Kyambogo, Kampala, Uganda.

[2] Busitema University, P. O. Box 236, Tororo, Uganda.

*Author for correspondence Email: kirabonkambwe@gmail.com

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Date Published:
20 December 2023

Keywords:
Teaching Strategies, Teacher-Centred Teaching Strategies, Learner-Centred Teaching Strategies, Student-Teacher Interactive Strategies, Interest.

ABSTRACT

Interest in Mathematics is a factor that most educators are interested in because of its impact on mathematics learning, and teachers are considered key players in fostering students' interest in mathematics. The study investigated the predictive effect of perceived teaching strategies on students' interest in mathematics among O-level students in the Wakiso district. A mixed methods approach was used; 332 Senior Three students in total were used for the quantitative data, six students from each school took part in focus group discussions (FGDs), and one O-level mathematics teacher from each school was a key informant for the qualitative data. The findings revealed that teacher-centred strategies did not significantly predict overall interest, individual interest, and situational interest in mathematics, learner-centred strategies positively predicted overall interest and individual interest in mathematics and did not significantly predict situational interest, student-teacher interactive strategies positively predicted overall interest, individual interest and did not significantly predict situational interest. The qualitative results confirmed the quantitative results complemented the qualitative results. The study concluded that teachers need to develop more innovative strategies that can tap into students' interests in mathematics lessons and overall interest in mathematics.

APA CITATION

Nakasiita, K. N., Olema, D. Baguwem, A. & Kibedi, H. (2023). Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda *East African Journal of Health and Science*, *6*(2), 80-91. https://doi.org/10.37284/eajhs.6.2.1649.

CHICAGO CITATION

Nakasiita, Kirabo Nkambwe, David Olema, Ali Baguwem and Henry Kibedi. 2023. "Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda". *East African Journal of Health and Science* 6 (2), 80-91. https://doi.org/10.37284/eajhs.6.2.1649.

HARVARD CITATION

Nakasiita, K. N., Olema, D. Baguwem, A. & Kibedi, H., (2023) "Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda", *East African Journal of Health and Science*, 6(2), pp. 80-91. doi: 10.37284/eajhs.6.2.1649.

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

IEEE CITATION

K. N., Nakasiita, D., Olema, A., Baguwem & H., Kibedi, "Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda", *EAJHS*, vol. 6, no. 2, pp. 80-91, Dec. 2023.

MLA CITATION

Nakasiita, Kirabo Nkambwe, David Olema, Ali Baguwemu & Henry Kibedi. "Teaching Strategies as Predictors of Students' Mathematics Interest among O-Level Students in Wakiso District, Uganda". *East African Journal of Health and Science*, Vol. 6, no. 2, Dec. 2023, pp. 80-91, doi:10.37284/eajhs.6.2.1649.

INTRODUCTION

Mathematics is a compulsory subject at the lower secondary level. Nevertheless, it is also regarded as abstract and associated with poor academic performance, low interest, and an overall dislike for the subject (Kihwele & Mkomwa, 2022). The way teachers teach mathematics is one of the factors highlighted as one of the many issues with maths (Jameel & Ali, 2016). Teaching strategies are a broad range of activities in class teachers and learners engage in to facilitate learning (OECD 2010). These might affect how interested students are in mathematics. The aim of the current study was to determine whether various teaching strategies can predict O-level students' interest in mathematics.

To understand the process and results of learning, scholars have recently taken an interest in the concept of interest (Atasoy, 2015). According to Renninger and Hidi (2011), interest develops as a result of a person's engagement with his environment. It is a psychological state as well as a tendency to repeatedly engage with specific activities, objects, or information throughout time. In addition, Renninger and Hidi distinguished between two categories of interest: situational interest and individual interest. According to Atasoy (2015) and Renninger & Hidi (2011), an individual's interest is a consistent, enduring quality that includes enjoyment, personal importance, a preference for a topic, and a general liking of a particular field. On the other hand, situational interest describes a state of attentiveness and an affective response at a certain moment in the environment that may be generated by an environmental stimulus that may or may not be persistent (Laine, 2019; Renninger & Hidi, 2011).

When a student is learning, actions like focused attention on a task, asking questions out of curiosity, and exhibiting an emotional response to the activity show that they have a situational interest in mathematics. Individual interest, on the other hand, may take the shape of a student's desire to pursue a profession in mathematics or a field linked to mathematics, sparking a conversation about a previously covered topic or engaging in independent reading. (Darlington, 2017; Renninger & Hidi, 2011). Numerous factors are listed in the vast body of literature that indicate students are not particularly interested in mathematics. Teacher-related factors, according to the literature, are cited as factors that might increase or decrease students' interest in mathematics. According to Kihwele & Mkomwa (2022), teachers' lack of innovative pedagogies and strategies is one factor that has a detrimental impact on students' interest in mathematics. These further recommended that teachers increase students' interest in mathematics using motivational techniques, including prizes, acknowledgment, encouragement, and praise.

According to Gouëdard (2021), a mathematics or science teacher's job is more than just imparting knowledge; they must also employ various innovative strategies that might enhance their students' psychological well-being. OECD (2010) describes teaching strategies to include all of the actions that instructors and students take to promote learning. According to Okafor and Anaduaka (2013), students choose instructors who can reduce tension and anxiety in mathematics and make learning engaging and fun. When a teacher simply presents mathematics in the abstract, students find learning frustrating (Azmidar et al., 2017). Dicke et al. (2021) further demonstrated that teachers who are passionate about their subject are more likely to develop a thorough understanding of the material, providing students with greater chances to find the subject interesting and relevant. A study by Jameel and

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Ali (2016) in Pakistan found that most mathematics teachers did not make the subject interesting and practical, which caused the students to develop negative attitudes and low interest and ultimately score poorly in math. Further, Ukobizaba et al. (2021) in a study about what makes students dislike math and its teaching practices in Rwanda, revealed that 50 % of the students agreed that harsh and careless teachers can demotivate students to learn mathematics and pointed out that students appreciate teachers who are careful, approachable and value the student's needs and interests. Kihwele & Mkomwa (2022) studies revealed that teachers' use of innovative teaching approaches and strategies positively affected mathematics interest, and Gouëdard (2021) results also showed that when teachers use innovative practices in class, it improves students' interest in mathematics and sciences.

According to Arends and Castle (2021), Socrates in the seventeenth century is where the history of teaching strategies begins, followed by antiquity and ancient Greece. They contend that teacher-centred teaching strategies were used in the nineteenth century, whereas Dewey introduced learner-centred methods in the twentieth century. According to Sibomana et al. (2022), when using teacher-centred strategies, students learn from the teacher. The teacher directs the flow of information and tries to give as much knowledge as possible in the least amount of time and effort possible. This study considered the lecture method under the teacher-centred strategy. This approach, which entails demonstration, drill, and practice, has been criticised for restricting the academic benefits of math (Sibomana et al., 2022).

The learner-centred instructional strategy is where there is active learning in class. The learner plays a key role in his or her learning through the utilisation of an interactive process between the teacher and the student. As a result, a student's enthusiasm and interest in mathematics increase (Kihwele and Mkomwa, 2022). The final strategy is the teacher-student interactive strategy, which combines teacher- and student-centred strategies. Mavumba and Mtitu (2022) in Tanzania found that teachers employ both teacher-centred and learner-centred strategies for better mathematics learning. A maths teacher can improve the learning of mathematics and interest in it. People frequently cite a maths teacher they had at one time in their education as the cause of their lack of interest in maths. It further proves what math teachers can do and undo in students' mathematical learning. (Okafor & Anaduaka, 2013). Apart from SESEMAT training (Secondary Science and Mathematics Training) for all science teachers, the government of Uganda introduced a competent-based curriculum. Teachers must use learner-centred strategies, teach mathematics in a friendly and inviting way, and allow students to engage in active learning. This raises the question of whether students' interest in Mathematics in Uganda is predicted by perceived teachers' teaching strategies.

According to the literature and results of earlier studies, it was anticipated that teaching strategies, including student-teacher interaction, learner-centred techniques, and teacher-centred strategies, would predict students' interest in mathematics. The study's findings are expected to contribute to the body of knowledge on the predictive effect of teaching strategies on students' interest in mathematics in Uganda. These findings may also be useful to empirical researchers. The study's findings may be helpful to educators and decision-makers in developing strategies to enhance teachers' strategies and methods that can tap into students' interest in mathematics and maintain it and enhance mathematics learning in general.

METHODOLOGY

The study took a pragmatic paradigm, a mixed methods approach employing both quantitative and qualitative approaches. A convergent parallel mixed methods design was used following the QUAN + qual technique. A closed-ended questionnaire was used to collect quantitative data, while Focus group discussions and key informants guided qualitative data.

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Study Participants

The study used a quantitative sample of 335 students drawn from a population of 2673 students from 16 schools from 8 sub-counties of Wakiso District. This was based on Krejcie and Morgan's table of determining the sample size. Wakiso District is made up of two counties and subcounties were proportionately selected with one county contributing to five schools while onother one three. Each sub-county contributed to two schools that were randomly selected: one government-aided and one private school. Only mixed schools were considered in the study. The study used proportionate random sampling to select the final sample from the schools. The schools with the highest number were more represented and vice versa. The final sample was selected using systematic random sampling. Six students from each school participated in focus group discussions, and one O-level mathematics teacher was a key informant guide for qualitative data. Wakiso District's location near the capital city gives it an advantage of having quality schools and teachers. However, UNEB the governing examination body has never excluded it from the woes sorrounding mathematics. The question was whether the challenges in mathematics related to interest and teaching strategies affect Wakiso district too.

Data Collection Instrument

The quantitative questionnaire had three sections, including students' demographic characteristics of gender and school type, interest, and perceived teaching strategies. Interest was measured using an adapted questionnaire by Darlington (2017). The questionnaire was slightly modified to fit the context of the respondents. Individual interest was measured with 8 items. 8, 9, 10, 13, 14, 15, 17, and 18. Items 13 and 18 were negatively stated. Situational interest was measured with 10 items- 1, 2, 3, 4, 5, 6, 7, 11, 12, and 16. Items 3, 12, and 16 were negatively stated. Negatively stated items were reverse-coded during data analysis. A 5-point Likert scale was used- (1) Strongly Disagree, (2) Disagree, (3) Not sure, (4) Agree, (5) Strongly Agree. Teaching strategies were measured using 33 items adopted from Costa (2014). The teacher-centred strategy was measured using 4 items: 14, 21, and 27. Other items measured learner-centred teaching strategies. Student-teacher interactive (combination of teacher-centred and learner-centred strategies) strategy was measured using all 33 items.

Qualitative data from students was collected using a Focus group interview guide with 6 questions, and data from teachers was obtained using interviews with a key informants interview guide containing 6 questions. To ensure validity and reliability, all the tools were pretested, and the Cronbach Alpha Coefficient (α) for interest was 0.93, and teaching strategies was 0.89. Factor analysis was also done since the adopted tools were self-constructed by the researchers and had not been tested in many contexts. The initial interest questionnaire had 28 items, and 10 items loading below 0.3 were removed. Factor analysis was also done on teaching strategies, and 2 items were removed because they had low loading below 0.3.

Research Procedure

Before data collection, Pre-visits were made to schools, and two research assistants were trained and involved in data collection. From each selected school, class teachers were contacted by head teachers and directors of studies. These provided class lists of senior three students for sampling purposes and questionnaires filled in classroom settings. Students selected were then requested for their willingness to participate in the study voluntarily. The Focus group discussions with students were conducted in a conducive place provided by the school. After collecting data from the students, Mathematics teachers who had been contacted before the day of collecting data to make appointments with them were interviewed as key informants. English was used during interviews, and FGDs and interviews were audio recorded with consent from participants.

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Data Management and Analysis

Quantitative Data

Before data analysis, data was checked for its suitability by checking for outliers and missing data. Missing data was handled with series means. Most of the outliers in the data were removed after deleting items loading below 0.3 in factor analysis. The rest were not removed because of the minimum sample size and were not significant enough to affect the results. Other diagnostics tests were done to check whether data was fit for regression with outliers. Normality was checked with P-P box plots, and linearity was checked with skewness and kurtosis, which were below -1 and 1, so the data was fit for regression analysis. Data were analysed using SPSS version 23. Regression analysis was used to test for predictability of teaching strategies on interest.

Qualitative Data

Qualitative data from focus group discussions and key informant interviews were analysed using manual analysis instead of modern software analysis packages due to the firm familiarity and skills of the researchers. The qualitative findings were reported depending on the themes, subthemes, and categories using direct quotations from the data set to further explain the relevant quantitative findings.

Ethical Considerations

Permission for collecting data was sought from Kyambogo University, Wakiso district, and from the schools. Ethical clearances were obtained from the Mbarara University of Science and Technology Research Ethics Committee (MUST-REC) and the Uganda National Council for Science and Technology. Confidentiality was ensured, informed consent from teachers and assent from students was obtained, and no recordings were made without the participants' permission, and their opinions were respected.

RESULTS

General Information

Out of the 335 questionnaires distributed, 3 questionnaires that were not well filled were left out, indicating a 99.1% response rate. Data was collected from 332 students. 164 (49.4%) males and 168(50.6%) females. Government aided contributed 152 (45.8%) and 180(54.2%) for private schools. Urban schools contributed to 253(76.2%) and rural schools 79(23.8%). Although the demographics were not considered in the data analysis, they represent students and schools in the study.

The results in *Table 1* show that there was no statistically significant prediction of perceived use of the teacher-centred strategy on overall interest (β =.06, t=1.16, p= .25), individual interest (β= .09, 1.65, p= .10), and situational interest (β= .04, t=.66, p= .51). This means that use of teacher-centred strategies does not affect students' interest in mathematics. The results are contrary to the qualitative narratives where students revealed that they get interested in mathematics in class if a teacher teaches them what to do instead of leaving them to fail countless times as they try to figure out mathematical calculations. Students showed that they lose interest in mathematics when they fail a lot.

The narratives below illustrate it. One student said,

> *We have different abilities in math, so teachers may be able to help us, the weak ones, improve by going step by step. Some teachers teach only clever students and leave us behind. He puts a number on the chalkboard and asks you to work it out instead of helping you. So, we lose interest in mathematics because when we get stuck, we fear asking the teacher* (Male student 1, FDG 10).

Another student said,

> *Let teachers handle us well and ask us in a friendly and teach us slowly how to do those hard calculations, especially some of us who*

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

> *do not understand it easily; we can eventually change the way we believe and pick interest. You know some teachers are harsh, especially when you fail a number* (Female student 5, SDG 6).

Also, one student said,

> *Some teachers, when they are teaching and one student shows that he/she has understood, leave the topic and ask you to continue, yet there are those who may not have understood. If you try one number and fail, you lose morale. For me, I prefer when the teacher does the hard calculations instead of giving them to us as an exercise* (Male student 6, FDG 2).

The narratives indicated that students preferred teachers to calculate numbers for them, especially the hard ones, instead of letting them figure them out because if the numbers are hard and they fail them, they lose interest. This is an indication that they sometimes prefer their teachers to use the teacher-centred strategy.

The results in *Table 2* show that there was a statistically significant positive prediction of the perceived use of learner-centred strategies on overall interest (β =.13, t=1.16, p= .02) and individual interest (β= .16, 2.97, p< .01). The results mean that when teachers' use learner-centred methods, it increases on their interest in mathematics. The adjusted R-squared value shows a small increase in interest with the use of learner-centred strategies, which implies that teachers need to be more innovative in their strategies that can tap into students' interest more. The results are in line with the qualitative narratives where students revealed that they get interested in class if their teachers use good methods like collaborative learning, which is a learner-centred strategy. The qualitative findings agreed with the quantitative findings. The narratives indicated that some student's interest is dependent on the way teachers teach.

Some students said the following;

> *In some calculations, the teacher tells us to look for raw materials and solve them for better understanding. That has helped me become more interested because I see how I can apply mathematics in real life* (Female student 2, FDG 10).

> *The teacher tells us to be in groups and then teaches us. This has helped me pick interest in mathematics because when I fail, I ask my friends to help me* (Female student 1, FDG 8).

> *Our teacher gives us brain teasers, which help us in math and make it exciting* (Male student 4, FDG 1)

The narratives show that students' interest depends on teachers using learner-centred strategies.

Quantitative results in *Table 2* further showed that there was no statistically significant prediction of the perceived use of learner-centred strategies on situational interest (β= .10, t=1.76, p= .08). This means that the use of learner-centred strategies did not affect students' situational interest or students' interest in mathematics lessons. The results also show that students interest in mathematics lessons being low may not depend on the teachers but may be on the conceptualisations, they have about math as a subject, which points to the non-predictability of learner-centred strategies on students' interest. The qualitative narratives support the findings.

For example, one student said,

> *Mathematics is itself hard so sometimes I do not even mind what the teacher is teaching or whether the teacher is good or bad. For me when I start seeing find X and Y, I switch off. Mathematics should be left to those who will use it after O-level or in their life* (Male student 1, FDG 2)

One teacher said,

> *Some students have a phobia of mathematics. sometimes you can use different methods but at the end of the day, a student tells you he or*

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

> *she has never been interested in math and prefers other subjects* (Male teacher).

The narratives indicate that students do not have an interest in mathematics not because of their teachers but because of the nature of mathematics, which points to situational interest.

The results in *Table 3* show that there was a statistically significant positive prediction of the perceived use of student-teacher interactive strategies on overall interest (β =.13, t=2.37, p= .02) and individual interest (β= .16, 2.93, p< .01). The results mean that when teachers' use both teacher-centred and learner-centred strategies, it increases on their interest in mathematics. The adjusted R-squared value shows a small increase in interest with the use of both teacher-centred strategies and learner-centred strategies, which implies that teachers need to be more innovative in their strategies that can tap into students' interest more.

Results further showed that there was no statistically significant prediction of the perceived use of learner-centred strategies on situational interest (β= .09, t=1.69, p= .09). This means that the use of both teacher-centred and learner-centred strategies did not affect students' situational interest or students' interest in mathematics lessons. The results are in line with the qualitative narratives where students revealed that they get interested in class if their teachers first show them what should be done instead of letting them solve difficult math calculations and fail countless times, which affects their interest in math but also preferred their teachers to use better strategies that can improve interest in their math lessons. This also explains the non-significant predictability of student-teacher interactive strategies on situational interest.

> *Our teacher teaches us differently sometimes; sometimes he calculates numbers on the chalkboard and asks us to also calculate, but sometimes, he does all the calculations. Sometimes, he does modelling. For example, he told us to make a pyramid using sticks and banana fibres. So, that model helped us recognise the angles. This has helped all students to catch up, even those who initially did not like mathematics.*

The narrative indicates that teachers use different strategies while teaching, which helps tap into students' interest, especially those who have low interest in mathematics.

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Table 1: Regression Model for the perceived use of teacher-centred strategy on overall interest, individual interest, and situational interest

Model	Independent variable	Dependent variable		Unstandardised Coefficients		Standardised Coefficients	t	R2	Sig.
				B	Std. Error	Beta			
1	Teacher-centred teaching strategy	Overall interest	Constant	63.64	3.55		17.95	0.00	< .01
				.28	.24	.06	1.16		.25
2		Individual interest	Constant	28.09	1.59		17.65	0.01	< .01
				.18	.11	.09	1.65		.10
3		Situational interest	Constant	35.55	2.22		16.01	0.00	< .01
				.10	.15	.04	.66		.51

Table 2: Regression Model for the perceived use of Learner-centred strategies on overall interest, individual interest, and situational interest

Model	Independent variable	Dependent variable		Unstandardised Coefficients		Standardised Coefficients	t	R^2	Sig.
				B	Std. Error	Beta			
1	Learner-centred teaching strategy	Overall interest	Constant	56.58	4.61		12.28	0.02	< .01
				.11	.04	.13	2.44		.02
2		Individual interest	Constant	24.62	2.06		11.93	0.02	< .01
				.06	.02	.16	2.97		< .01
3		Situational interest	Constant	31.96	2.90		11.04	0.01	< .01
				.05	.03	.10	1.76		.08

Table 3: Regression Model for the perceived use of student-teacher interactive strategies on overall, individual, and situational interest.

Model	Independent variable	Dependent variable		Unstandardised Coefficients		Standardised Coefficients	t	R^2	Sig.
				B	Std. Error	Beta			
1	Student-teacher interactive strategy	Overall interest	Constant	56.64	4.70		12.05	0.01	< .01
				.09	.04	.13	2.37		.02
2		Individual interest	Constant	24.57	2.11		11.67	0.02	< .01
				.05	.02	.16	2.93		< .01
3		Situational interest	Constant	32.07	2.95		10.86	0.01	< .01
				.04	.02	.09	1.69		.09

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

DISCUSSION

According to findings in *Table 1*, there was no statistically significant prediction of teacher-centred strategy and overall interest, individual, and situational interest. According to the study's findings, teacher-centred teaching strategies do not affect students' interest. However, this contradicted qualitative narratives in which students claimed that mathematics is filled with calculations and that they fail when left to come up with solutions or try them out on their own. This supports the myths about mathematics being difficult and leading to a loss of interest in it. Students demonstrated that they preferred their teachers to explain the skill that needed to be performed, demonstrate it, and then allow the students to practice. This discrepancy in results may be related to the idea that mathematics is inherently abstract. Still, students also need to be reassured that failure does not indicate a lack of mathematical aptitude. Even in the face of failure, students must be encouraged, and teachers must not only impart knowledge but also apply innovations that will increase students' interests.

The quantitative findings are in line with Sibomana et al. (2022), who found out that teachers use teacher-centred strategies and alluded that the lecture method that involves demonstration, drill, and practice is criticised for limiting academic benefits in mathematics. From the qualitative findings, teachers use teacher-centred strategies in which students feel that when they know what to do from their teacher, it improves their interest than when they are left to figure out things on their own, fail and demotivate them, hence impacting their interest in mathematics. However, Sibomana et al. (2022) stated that lecture method/teacher-centred strategies lead students to the initial acquisition of information but do not allow students to engage in learning to obtain it.

The findings in *Table 2* revealed a statistically significant positive prediction of learner-centred strategies on overall interest and individual interest in mathematics. However, learner-centred strategies did not significantly predict situational interest. The study's findings suggest that learners become more engaged, actively participate in the classes, and eventually develop a more developed interest in mathematics when teachers employ various learner-centred strategies. The results demonstrate that learner-centred strategies affect students' interest, even though their influence is minimal as indicated by the Adjusted-R square value. Results are consistent with the qualitative findings, in which students said teachers who employ learner-centred methods like demonstration and collaborative learning increase their engagement and interest. However, students' and instructors' accounts indicated that, regardless of the teachers' strategy, mathematics is challenging, and other subject sessions are more enjoyable than mathematics, which points to situational interest. This may explain the low adjusted-R squared value. This can explain why learner-centred strategies predicted overall and individual interest but not situational interest in mathematics. Results are in agreement with Savelsbergh et al. (2016), Gouëdard, (2021), and Kihwele & Mkomwa (2022), who showed that teachers' use of learner-centred strategies improved students' interest in mathematics.

Table 3 results revealed a statistically significant positive prediction of student-teacher interactive strategies on overall interest and individual interest in mathematics. However, student-teacher

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

interactive strategies did not significantly predict situational interest. Results implied that when teachers combine teacher-centred methods where they lead the teaching, demonstrate what is to be done, and then ask students to demonstrate the same skill with a combination of other methods like problem-solving, and collaborative learning, students' interest is improved. The results align with qualitative results where students explained that mathematics is full of calculations and they easily lose interest when they are left to figure out the hard calculations on their own. They further revealed that when they fail a number of times, they lose morale and interest in mathematics. They preferred their teachers to help them figure out what is required of them while using interactive strategies in class. Therefore, when teachers use a combination of teacher centred strategies and learner, centred strategies, it improves their interest in mathematics. The non-significant prediction of student-teacher interactive strategy on situational interest is related to the explanations pointing to the conceptions and nature of mathematics as a subject as being complex and difficult. Results align with Mavumba and Mtitu (2022) in Tanzania who showed that teachers used both teacher- and learner-centred strategies while teaching mathematics. They concluded that the involvement of both strategies allowed the students and teachers to love the mathematics classes.

CONCLUSIONS

The study results indicated that teacher-centred teaching strategy did not predict overall interest, individual, and situational interest. The results meant that teachers doing much of the teaching in mathematics do not help in the improvement of students' interest; instead, it bores them and causes them to lose interest in mathematics. The predictability of learner-centred strategies and student-teacher interactive strategies on overall interest and individual interest implies that when teachers use better interactive strategies in their teaching, letting learners be agents in their mathematics learning improves students' interest. Therefore, teachers need to incorporate more innovative strategies in their teaching to improve students' interest. This is because the effect of the use of traditional learner-centred and student-interactive strategies was low on students' interest. The non-predictability of the strategies on situational interest meant that teachers needed to develop more strategies to improve students' interest in the classroom. Situational interest is dependent on environmental and extrinsic factors of the students and, if maintained, can result in individual interest. So, the teachers need to adjust environmental and extrinsic factors around the students to capture learners' interest in mathematics lessons and develop the situational interest into a well-developed interest.

Recommendations

The researchers recommend that teachers' use more innovative strategies as teacher-centred strategies proved not to improve students' interest. The researchers further recommend that policymakers come up with more innovative strategies that help capture learners' interest in class, as traditional strategies seemed to predict interest less and not to improve situational interest. Strategies like the incorporation of ICT in the learning of mathematics and the use of audio-visual aids can be emphasised.

The researchers also recommend carrying out a comprehensive study across Uganda, as the

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

current study was in Wakiso District only. The researchers further recommend studying the perceived use of teaching strategies using more innovative strategies other than the ones used in the study.

REFERENCES

Arends, R.I. & Castle, S. (2021). Instructional strategies: History, nature and categories of instructional strategies, instructional strategies, and learner outcomes.

Atasoy, V. (2015). The role of achievement goal orientations and interest on metacognitive strategy use of preservice science teachers. *Turkish Journal of Education*, *4*(3), 4-15.

Azmidar, A., Darhim, D., & Dahlan, J. A. (2017, September). Enhancing students' interest through mathematics learning. In *Journal of Physics: Conference Series* (Vol. 895, No. 1, p. 012072). IOP Publishing.

Costa. (2014). Science and mathematics instructional strategies, teaching performance and academic achievement in selected secondary schools in Upland Cavite. Dissertation. Cavite State University.

Darlington, H. M. (2017). Understanding and developing student interest in science: an investigation of 14-16year-old students in England (Doctoral dissertation, UCL (University College London)).

Dicke, A. L., Rubach, C., Safavian, N., Karabenick, S. A., & Eccles, J. S. (2021). Less direct than you thought: Do teachers transmit math value to students through their cognitive support for understanding? *Learning and Instruction*, *76*, 101521.

Gouëdard, P. (2021). Sky's the Limit: Growth Mindset, Students, and Schools in PISA. PISA 2018. *OECD Publishing*.

Kihwele, J. E., & Mkomwa, J. (2022). Promoting students' interest and achievement in mathematics through "King and Queen of Mathematics" initiative. *Journal of Research in Innovative Teaching & Learning*, (ahead-of-print). *Research*, *9*(4), 149–156. https://doi.org/10.2478/jesr-2019-0064.

Jameel, H. T., Ali, H. H., & Phil, M. (2016). Causes of poor performance in mathematics from teachers, parents and student's perspective. *American Scientific Research Journal for Engineering, Technology, and Sciences*, *15*(1), 122-136.

Laine, E. (2019). The interactions and relationships of achievement motivation, interest and learning in different educational contexts. Doctoral programme on learning, teaching and learning environments research. University of Turku.

Mavumba, H. Z., & Mtitu, E. A. The Use of Learner-centred Approaches in Mathematics Subject: A Case of Pugu Secondary School in Ilala District, Tanzania. *East African Journal of Education and Social Sciences (EAJESS)*, *3*(3), 39-45.

OECD. (2010). Mathematics Teaching and Learning Strategies in PISA. In *Ocde*. http://www.oecd- ilibrary.org/education/mathematics-teaching-and-learning-strategies-in-pisa_9789264039520-en.

Article DOI: https://doi.org/10.37284/eajhs.6.2.1649

Okafor, C. F., & Anaduaka, U. S. (2013). Nigerian school children and mathematics phobia: How the mathematics teacher can help. *American Journal of Educational Research*, *1*(7), 247-251.

Renninger, K. A., & Hidi, S. (2011). Revisiting the conceptualisation, measurement, and generation of interest. *Educational psychologist*, *46*(3), 168-184.

Savelsbergh, E. R., Prins, G. T., Rietbergen, C., Fechner, S., Vaessen, B. E., Draijer, J. M., & Bakker, A. (2016). Effects of innovative science and mathematics teaching on student attitudes and achievement: A meta-analytic study. *Educational Research Review*, *19*, 158-172.

Sibomana, A. B., Ukobizaba, F., & Nizeyimana, G. (2021). Teachers' perceptions of their teaching strategies and their influences on students' academic achievement in national examinations in Burundi: Case of schools in Rumonge province. *Rwandan Journal of Education*, *5*(2), 153-166.

Ukobizaba, F., Ndihokubwayo, K., Mukuka, A., & Uwamahoro, J. (2021). From what makes students dislike mathematics towards its effective teaching practices. *Bolema: Boletim de Educação Matemática*, *35*, 1200-1216

