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Teachers' self-Efficacy as a Predictor of Students' Motivation to Learn Among Secondary School Students in Laikipia County, Kenya

Mbuthia Ngunjiri

Professor, Department of Curriculum and Instruction, Lsikipia University, Kenya

Abstract:

This study investigated the influence of teachers' self-efficacy beliefs on students' motivation to learn secondary school mathematics in Laikipia County, Kenya. The study was guided by Keller's ARCS model of motivation. Descriptive research design was employed in the study. The target population was all 8357 Form Four students in the County. A sample of 412 respondents comprising of 392 students and 20 mathematics teachers from the sample classes was selected for the study. Simple random sampling was used to select participating schools, sample classes and students. A self-administered questionnaire was used for data collection. Cronbach's alpha was used to estimate the reliability of research instruments. Data was analyzed using Pearson's correlation coefficient and simple regression analysis at.05 level. The findings indicated that teachers' self-efficacy beliefs contributed significantly to students' motivation to learn. The study concludes that teachers' efficacy beliefs play an important part in developing students' motivation to learn mathematics among secondary school students.

Keywords: Motivation to learn; secondary school; teacher's self-efficacy

1. Introduction

In Kenya, mathematics is offered as one of the core subjects in primary and secondary schools' curricula (KIE, 2002). At tertiary levels, general mathematics is offered in most programs where it is not a core subject. This emphasizes the importance attached to the subject in the development of science and technology. Mathematics is also used as a tool in other subjects such as Finance and Business studies. Therefore, there is a great demand that every child should study and succeed in mathematics at school (Cockroft, 1982). This expectation is not realizable when secondary school learners continue to perform poorly in the subject at the national level in Kenya (Kenya National Examinations Council (KNEC), 2020).

Report of KNEC mathematics examinations statistics indicated a national grand mean score of 2.630, 3.161, 3.205 and 3.385 from the year 2016 to 2019 respectively, where maximum mean score is 12 points (KNEC, 2020). In Laikipia County, the KCSE mathematics mean performance by gender for the period 2016 to 2019 is given in Table 1.

Year	Entry	Boys	Girls	Overall
2016	7237	2.859	2.699	2.779
2017	7643	3.350	3.123	3.236
2018	7828	3.560	3.322	3.441
2019	8357	3.739	3.459	3.599

Table 1: KCSE Mathematics Mean Performance by Gender from 2016 to 2019 in Laikipia County

Note: Mean Ranges from 0 to 12

Source: KNEC (2020)

The low performance in secondary school mathematics can be attributed to several factors. These includes: lack of learning resources, lack of motivation for teachers and learners in mathematics classrooms, inadequate coverage of the curriculum, negative attitude toward the subject amongst others (TIMSS, 2004), and self-efficacy in mathematics (Bandura, 1997; Skaalvik & Skaalvik, 2010).

According to Tella (2007), of all the personal and psychological variables influencing learning that have attracted researchers, motivation to learn has gained more popularity and leading other variables. Therefore, the issue of motivation of students and its impact on academic performance is considered as an important aspect of effective learning. In fact, psychologists believe that motivation is a necessary ingredient in learning (Biehler & Snowman, 1997; Brophy, 2004; Ormrod, 2006; Stipek, 1998). It is believed that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn (Brophy, 2004; Stipek, 1998). A motivated learner strives to understand the subject matter, seek challenges and persist on tasks even in the face of difficulties (Meece et al., 2006; Pajares & Schunk, 2001).

Furthermore, Bandura (1994) argued that motivation can infest itself in various forms such as effort expended, persistence, and choice of activities.

This study examines the relationship between teachers' self-efficacy and motivation of students. Self-efficacy is particularly salient to motivation (Skaalvik & Skaalvik, 2010). According to Bandura (1997), self-efficacy is the perceived awareness of one's ability to produce the desired results for a particular task. Teachers play a significant role in the way students perceive and motivate themselves because they believe they are the role models in which students observe when aiming at attaining knowledge. Specifically, a teacher's sense of efficacy is necessary for possible student outcomes (Hoy & Davis, 2006).

The influence of teachers' efficacy beliefs on student achievement is well documented in educational literature and the beliefs are derived from sources of information teachers obtain from professional experiences (Wallen & Hale, 2016). According to Hoy and Davis (2006), a teachers' sense of efficacy is a judgment about capabilities to influence student engagement and learning, even among those students who may be difficult and unmotivated. Bandura (1997) suggested that teachers with a high sense of efficacy operates on the belief that difficult students are teachable through extra effort and appropriate techniques, and that they can enlist family support and overcome negating community influences through effective teaching. On the contrary, low efficacious teachers believe there is a little they can do if students are unmotivated.

In Laikipia County, Kenya despite the poor performance in mathematics at the end of secondary school education, there is lack of information on the influence of teachers' self-efficacy in the learning mathematics. Specifically, the influence of teachers' efficacy on motivation to learn has received no attention.

Bandura (1986, 1994, & 1997) identified four sources that impact on personal efficacy. These are: (i) mastery experiences, (ii) vicarious experiences, (iii) verbal persuasions, and (iv) physiological/emotional states. Similarly, the four main sources of teachers' efficacy are: (i) master experiences (i.e., direct teaching experiences that are challenging but successful), (ii) vicarious experiences (i.e., watching peers of similar ability teach challenging ideas with success), (iii) verbal persuasions (i.e., receiving positive feedback from students, peer teachers and significant others), (iv) physiological/emotional states (i.e., feelings of success and confidence (Bruce, Esmonde, Ross, Dookie & Beatty, 2010). In all, teachers' self-efficacy has been found to be one of the important variables influencing positive teaching behaviors and student outcomes (Bembenutty, 2007; Bruce et al., 2010; Skaalvik & Skaalvik, 2010).

In the present study it is hypothesized that teachers' self- efficacy beliefs have no influence on students' motivation to learn in Laikipia County, Kenya. The four dimensions of motivation to learn that are the focus of this study are: (i) attention (A), (ii) relevance (R), (iii) confidence (C) or expectancy for success and (iv) satisfaction (S) in the learning process (Brophy, 2004; Driscoll, 2005; Keller 1999, 2006). Tschannen-Moran et al. (1998) suggested that the major influences on efficacy beliefs about teaching are cognitive interpretations of the four sources of self-efficacy as described by Bandura (1986, 1997). These sources of efficacy and other strategies for enhancing teachers' efficacy can be more effective if the relationship between students' motivation to learn and teachers' self-efficacy beliefs is established in Laikipia County. In the County, such empirical evidence is lacking hence the need for this study.

2. Objective of the Study

The objective of this study is to determine the influence of teachers' self-efficacy beliefs on students' motivation to learn mathematics among secondary school students in Laikipia County, Kenya.

3. Hypothesis of the Study

(The hypothesis is tested at .05 level of significance)

- HO₁: There is no statistically significant influence of teachers' self-efficacy beliefs on motivation to learn mathematics among secondary school students in Laikipia County, Kenya.

4. Methodology

The target population for this study was all 8357 Form Four students from 113 secondary schools in Laikipia County. This category of students was selected on the assumption that they have covered most of the content in the secondary school syllabus, and therefore can form an independent opinion in mathematics. The respondents were drawn from twenty (20) randomly selected public secondary schools in Laikipia County. Simple random sampling was used to select participating schools, sample classes and respondents. The sample consisted of 412 respondents comprising of 392 students and 20 mathematics teachers from the sample classes. The sample size was determined using the Krejcie and Morgan's (1970) table of sample sizes.

5. Instrumentation

The students' motivation to learn (MTL) scale (Keller, 2006) and Teachers' self-efficacy (TSE) scale (Skaalvik & Skaalvik, 2010) were used for this study. The MTL consisted of 34 items. Twenty-five items were positively worded and nine items negatively worded. The items were scored on a five-point scale from strongly disagree (1) to strongly agree (5). Keller (2006) reported an alpha reliability of 0.95 for the scale. The TSE scale had 24 items split into six-subcales on personal teaching efficacy. These are: instructional efficacy, adapting instruction to individual student needs, ability to motivate students, ability to keep discipline, ability to cooperate with colleagues and parents, and ability to cope with changes. The Cronbach's alphas for the subscales were 0.83, 0.90, 0.83, 0.91, 0.77 and 0.81 respectively. All the TSE items were presented in form of positive statements and the responses were scored on an 11- point scale (Skaalvik & Skaalvik,

2010) from 0 (the lowest) to 10 (the highest). The scale was constructed according to Bandura's (2006) recommendations for construction of efficacy items.

6. Data Analysis

The Pearson's correlation coefficient(r) and simple regression analysis were used in data analysis

7. Results

The results of data analysis are presented in Tables 1 and 2.

Variables	R	r ²	Adjusted r-square	Std. error of the estimate
MTL and TSE	.187	.035	.033	15.183

Table 2: Pearson's Correlation Coefficient between Students' Motivations to Learn (MTL) and Teachers' Self-Efficacy (TSE)

The results in Table 2 indicate a statistically significant correlation between students' motivation to learn (MTL) and teachers' self-efficacy (TSE). Therefore, MTL and TSE are not independent. Teachers' self-efficacy explains 3.5% of the variability in motivation to learn mathematics. The results of simple regression analysis are presented in Table 2.

Source	Sum of squares	df.	Mean square	F	Sig.
Regression	4081.161	1	4081.161	17.702	.000
Residual	113197.119	390	230.544		
total	117278.280	391			

Table 3: Simple Regression Analysis of Teachers' Self-Efficacy on Students' Motivation to Learn Mathematics

a. Dependent Variable: Motivation to Learn

b. Predictor: Teachers' Self-Efficacy

The results in Table 3 show that the F-value is significant ($F(1,390) = 17.702, p = .000$). The interpretation is that teachers' self-efficacy makes a significant contribution in the prediction of students' motivation to learn mathematics among secondary school students in Laikipia County. Therefore, H_{01} is rejected.

8. Discussion

From the analysis of data, it was found that the correlation coefficient between students' motivation to learn and teachers' self-efficacy was .187 which is low but significant. This means that in any increase in efficacy beliefs, there is a corresponding increase in the level of students' motivation to learn. Furthermore, from the analysis it was found that teachers' self-efficacy beliefs make a significant contribution to the prediction of students' motivation to learn. The finding in this study is in agreement with earlier studies by Bembenutty (2007), Bruce et al. (2010), Caprara et al. (2006), Skaalvik and Skaalvik (2010), Skaalvik, Federici Klassen (2015) and Wallen and Hale (2016) that teachers' self-efficacy is one of the important variables influencing positive teacher behaviors and students' outcomes. In the current study, teachers' efficacy beliefs have been found to be significantly related to students' level of motivation to learn. Sources of efficacy beliefs lead teachers to believe that they possess or lack the ability to accomplish tasks (Tschannen -Moran et al.; 1998, Warren & Robinson, 2015). Bandura (1997) cited four sources of information that influence teachers' perceived ability to complete tasks. These are mastery experiences, vicarious experiences, verbal persuasions, and physiological/ affective states.

The most influential of teachers' self-efficacy beliefs is mastery experiences (Tatar & Buldur, 2013). Teachers' classroom experiences and level of their performance during tasks provide evidence of their ability (Bernadowski et al., 2013). Mastery experiences are developed when teachers actively attempt to engage students in learning activities (Skaalvik & Skaalvik, 2014). Success builds a strong sense of efficacy (Bandura, 1997). Therefore, if teachers experience success during a task or series of tasks their perceived level of ability to complete the tasks is strengthened.

Teachers also gauge their abilities by witnessing the successes and failures of experienced others (Morris, 2011). These vicarious experiences influence teachers' sense of efficacy to complete classroom tasks, where success of others will make them believe they can achieve similar goals. Failures of colleagues, lead teachers to question their own ability to plan lessons, engage students, and carry out learning activities (Tatar & Buldur, 2013).

Verbal persuasions, also known as evaluate feedback is another important factor in the formation of efficacy beliefs. The influence of verbal persuasions on teachers' efficacy beliefs is often mediated by the perceived knowledge and credibility of the person providing the feedback (Tatar & Buldur, 2013). Therefore, through verbal persuasions peers or colleagues can either positively or negatively influence teachers' ability to complete classroom tasks.

Physiological and affective sources of information such as responses to stress and anxiety can also influence teachers' efficacy beliefs (Bandura, 1997; Tatar & Buldur, 2013). Teachers are more resilient when they feel optimistic about the likelihood of positive outcomes and their ability to work against obstacles. Therefore, physiological and affective sources of information appear to impact on motivation, efficacy beliefs, and burnout (Skaalvik & Skaalvik, 2014).

Bruce et al. (2010) also posits that the four sources that impact on teacher efficacy are: (i) direct teaching experiences that are challenging but successful (i.e., mastery experiences, (ii) watching peer teachers of similar ability

teach challenging ideas(i.e., vicarious experiences),(iii) receiving positive feedback from students peer teachers and superior(i.e., verbal persuasions), and (iv)feelings of success and confidence (i.e., emotional states). The resulting efficacy judgments influence the goals teachers set for themselves, the effort they invest in teaching in reaching these goals, and their persistence when facing difficulties.

Bruce et al. (2010) have summarized the connection between teachers' efficacy and students' achievement. First, in their view high efficacious teachers are more likely to implement and persist with challenging yet effective strategies. For example, these teachers are more willing to take the risk of the subject matter conversations to areas where they are not confident of the content direction or the outcome. Second, efficacious teachers have high expectations of all students because they believe students can achieve and can spend more time with low achievers than their low efficacy peers. In their view, when teacher efficacy is high, there is greater belief that academic ability can be improved for all students rather than seeing ability as a fixed commodity. Furthermore, they posit that efficacious teachers can create a classroom that encourages adoption of mastery orientations (i.e., approaching a task for the purpose of learning something) rather than performance orientations (i.e., approaching a task for the purpose of demonstrating superiority over others). Third, Bruce et al. argued that high efficacious teachers also have effective classroom management strategies that encourages students to take responsibility of their learning.

According to Bruce et al. (2010), students in classrooms where teachers have high self- efficacy have better study habits such as persistence, deep conceptual understanding, and self-regulation which are evident during learning, and all of which are developed in high efficacy classrooms which leads to greater motivation and achievement in a particular subject.

9. Conclusion

The results of this study have both theoretical and practical implications. It practically demonstrates that students' motivation is predictable from teachers' self-efficacy beliefs. It is clear that efficacy beliefs influence the effort teachers invest in teaching. Among other things, efficacious teacher plan more, persist longer with students who are struggling, have high expectations for all students, and are less critical of students who make errors. High efficacious teachers are more likely to be more open to new ideas, more willing to experiment with new methods to better meet the needs of their students, and more likely to implement and persist with challenging yet effective strategies. Efficacy beliefs also influence teachers' persistence when things do not go smoothly, and their resilience in the face of setbacks. Theoretically, this study adds to previous studies which shows the central role of teachers' self-efficacy on students' motivation to learn. Therefore, it emerges that teachers' self-efficacy plays an important part in the development of students' motivation to learn mathematics among secondary school students in Laikipia County, Kenya.

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