Motivational and Mathematics Achievement Differences of Male and Female Primary School Students

Molla Haftu Shaine

College of Social Sciences and Languages, Department of Psychology, Mekelle University, Ethiopia
Email: molla.haf2@gmail.com

Abstract

The study was designed to examine the motivational and mathematics achievement differences between male and female primary school students. To achieve this, a descriptive survey design was used. There were a total of 281 students in the primary school. Of these, 162 students (82 males and 80 females) were selected as participants using systematic random sampling after stratification by sex. Data were acquired through both adopted and self-developed instruments for measuring the mathematics and motivational differences between male and female students. The validity and reliability of the instruments were enhanced through a pilot study and the adoption of some already validated items. Cronbach's α was calculated to check the reliability of the instruments. While an independent t-test was employed to compare means, multiple regression analysis was conducted to investigate the role of motivational variables in predicting mathematics achievement among primary school students. Accordingly, the independent sample t-test revealed that boys, on average, scored higher than girls in all variables. Correlation analysis showed a high relationship between self-efficacy and mathematics achievement. Results of multiple regression analysis suggested that the contribution of self-efficacy beliefs was by far the greatest for both sexes. Furthermore, the study indicated that there is a gender difference in mathematics achievement between male and female students. Finally, the implications for improving students' learning are highlighted.

Keywords: *Mathematics achievement, Motivational variables, Primary school, Students*

Introduction

The study of gender differences in academic achievement has been the subject of extensive investigation by many researchers. For instance, Schunk, Meece, and Pintrich (2014) found that girl's mathematics achievement in the primary grades was equal to boys but decreased in middle school. More recent studies provide additional support for these findings. For example, Heyder and Kessels (2013) indicated that in the early years of schooling, individual differences in mathematics attainment are difficult to establish. Other studies have also revealed significant gender differences in mathematics and science achievements, favoring males over females (Honicke & Broadbent, 2016). On the contrary, Shkullaku (2013) extends this argument and cautions against the assertion that there is an evident gender difference in mathematics achievement favoring males. A study conducted by Hyde (2014) revealed gender differences in overall mathematics ability and found that girls slightly outperformed boys in reasoning ability, but in specific mathematics ability, boys had a significant advantage over girls.

Studies indicating the existence of gender differences in mathematics achievement seem to suggest that the prevailing differences are attributed to a number of factors. Within the field of motivation, three major factors have been identified as playing a major role in these gender differences: self-efficacy, attribution style, and expectancy-value. These factors have been linked to levels of academic achievement (Wigfield, Tonks & Klauda, 2016). More specifically, high levels of self-efficacy, appropriate attribution styles, and expectancy-value are related to satisfactory achievement in mathematics (Schunk & DiBenedetto, 2016; Wigfield, Tonks & Klauda, 2016). For example, Schunk and DiBenedetto (2016) posited that self-efficacy, the perceived competence of an individual, determines the strategies students employ to attain the level of performance they expect, the nature of goals they set, the amount of effort they exert, the amount of time allocated to challenge the given task, their steadfastness in engaged activities, and their interest in exercising the task. Similarly, Schunk and Greene (2018) indicated that students' achievement motivation is influenced by their level of self-efficacy.

Generally, Bandura (1989) maintained that "self-efficacy beliefs affect thought patterns that may be self-aiding or self-hindering" (p.1175). He argued these beliefs influence the cognitive, motivational, and affective processes of individuals in the course of their academic endeavors. In sum, Schunk and his associates (2014) stated that girls, as a group, are at greater risk than boys due to their significantly lower perceptions of mathematics self-efficacy.

In addition, the way students attribute failure or success affects their academic achievement. Students may experience failure or success in school and attribute these outcomes to themselves or their environment to explain the causes. Attribution style refers to how people explain the causes of their own achievement. It may be defined as the causal explanation that individuals give to

various intrapersonal and interpersonal actions in their lives (Schunk, 2012). Many research findings have demonstrated the existence of different attribution patterns in boys and girls. Generally, girls tend to emphasize effort when explaining their performance (Vecchione, Alessandri, & Marsicano 2014) while boys are more likely to attribute their academic achievement to ability and luck(McClure, Meyer, Garisch, Fischer, Weir, & Walkey, 2011). Research has also indicated that girls usually make external attributions for successes and failures, and when they make internal attributions, these are more likely to refer to effort rather than ability (Pajares & Valiante, 1999). However, boys usually attribute successes to stable internal causes like effort, showing an attribution pattern that enhances their self-image (Randhawa, 1991).

In general, students' perceptions of their educational experiences influence their motivation more than the actual objective reality of these experiences. For instance, a history of success in a given subject typically encourages continued persistence in that area. On the other hand, when students have a history of failure in school, it becomes particularly difficult for them to maintain the motivation to keep trying (Schunk, 2012). This shows that the attribution style of the learners has an impact on their academic achievement.

A factor which is equally important to the above-mentioned variables is one's expectation-value for future achievement. Research conducted by Wigfield, Tonks, and Klauda (2016) explained that "individuals' choices, persistence, and achievement can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity" (p. 69). The more valuable individuals perceive a task to be, and the more competent they feel in attempting that task, the higher their achievement levels tend to be.

Many day-to-day events that are found in classrooms exemplify the importance of expectancy-value theory. Children, who hold value in a task and their related skills, can determine such things as future pursuit of related activities, and motivation to persevere. Wigfield et al. (2016) noted that higher achievement expectancies were linked directly to higher grades.

Research has identified an important relationship between individuals' expectancy-values and their academic achievement levels. The more value and competency individuals identify regarding an academic task, the higher the resulting achievement reported.

In summary, research suggests that there are gender differences in students' expectancy-values. Specifically, boys tend to place more value and expect higher competency in areas such as mathematics, whereas girls tend to place more value and expect higher competency in areas such as language (Whitaker & Dempsey, 2013).

Studies carried out in Ethiopia have also reported that there is a remarkable gender difference in achievement of mathematics subject at various levels of educational settings (MoE, 1999; MoE, 2001). Furthermore, data from school records indicate that mathematics has been one of the main subjects in which girls scored below the desired national average (Zewdie, 1998). The Ethiopian Education and Training Policy stipulated that students need to have strong background knowledge in mathematics (MoE, 1994). This is because mathematics is considered a means for the development of critical thinking and problem-solving abilities. Moreover, studies showed that persons employed in mathematics and science-related careers tend to gain more autonomy, higher status, and higher pay than do persons in other career domains (Whitaker & Dempsey, 2013).

Despite the above research, the literature is not unanimous that gender differences influence students' attribution, expectation, self-efficacy, and math achievement. Research studies (e.g., Cleary & Kitsantas, 2017; Conley, 2012) have identified no, or only small, gender differences with respect to these variables.

Thus, the above research results indicate that it is difficult to conclude whether or not gender differences affect students' motivational beliefs and mathematics achievement. However, there is certainly sufficient evidence to suggest that investigating these differences may lead to a more complete understanding of interacting processes underlying students' attribution, self-efficacy, expectation, and math achievement.

Many researchers (e.g., Bieg, Goetz, Wolter, and Hall, 2015; Joët, Usher & Bressoux, 2011) have recommended that since many of the difficulties that students experience in their learning are closely connected with the beliefs they hold about their academic expectations, perceptions of their capabilities, and the nature of the attributions they give to explain their actions, these variables have to be extensively studied for they are significant components of motivation and behavior. Hence persistent sex differences in mathematics achievement will best be understood through investigations of motivational beliefs such as competence perceptions, expectations, and attributions (e.g., Guo, Parker, Marsh, and Morin, 2015; Weiner, 2010).

Having observed such diverse findings in the study, the researcher attempted to examine whether there is an association between gender and mathematics achievement in relation to these variables. In addition, the researcher has found no other previous research that brought these variables together to highlight their possible significance in explaining mathematics achievement in primary school learners in the Ethiopian context. Therefore, this research is believed to fill in the gap in knowledge so that concerned bodies such as teachers, parents, counselors, and educational planners take appropriate measures. To this end, the following research questions were formulated.

- Is there any significant relationship between academic self-efficacy, attribution, expectations, and mathematics achievement of primary school learners?
- Are there significant gender differences among students' academic self-efficacy, expectations, causal attributions, and mathematics achievement?
- Do students' self-efficacy, expectations, and attributions, predict students' academic achievement? If so, which independent variable (s) has (have) the strongest predictive value?

The objective of this study was to examine the extent to which academic self-efficacy, expectations, and causal attributions for success and failure contribute to mathematics achievement differences between male and female primary school learners. With regard to its significance, educational policymakers may use these findings to actively support and encourage both male and female students in their pursuit of individual values and goals and the realization of each individual's potential.

Identifying learners' self-beliefs will have implications for parents, teachers, counselors, and school administrators to be aware of the vital role of students' feelings of competence, expectations, and causal attributions to their academic success in their schooling.

It might also provide information and encourage to other interested researchers to pay more attention and do further study to gender-related motivational problems in order to better understand the impact of motivational beliefs on students' academic achievement in Ethiopian schools. And, finally, the study will enrich the available literature in the area of motivational beliefs and school achievement.

Methods

Research Design

The research employed a descriptive survey design to address the research questions. This was accomplished through the use of a descriptive rating, a Likert-type survey, which was used to collect quantitative data from students in primary schools. According to Suskie (1996), a rating survey instrument adds familiarity for most people and allows the researcher to make comparisons among the respondents**.**

Population, Sample, and Sampling Techniques

The target population of the study was grade 7 students in Adi Haqi Primary School, in Mekelle, Tigray, Ethiopia. From a total population of 281 students, 168 students were selected as a sample

of the study using a systematic random sampling technique after stratification on sex in each class was made. Out of the total 168 students, 162 students correctly filled out and returned the questionnaire.

The selection of the sample was done through stratified sampling. This technique was chosen because it guarantees the desired representation of relevant sub-groups to increase the efficiency of the population estimates (Gay, 1996).

The students were first divided into two strata (males and females). Each student was assigned a number. The numbers were written down on small pieces of paper, which were folded and placed in two different cartons representing each stratum (sex). The researcher used all the 3 sections of the selected grade level.

Data Collection Instrument

In this study attribution scale, self-efficacy scale, expectancy-value scale, and mathematics achievement test prepared by subject experts were used as data-gathering instruments from students.

Students' Questionnaire

The questionnaire consisted of basic background information and items focusing on individual student perceptions in three areas: academic self-efficacy, expectation, and causal attributions of success or/and failure.

a. Attribution Scale

The attribution questionnaire was adopted from the work of Tamirie (1997) and developed to measure the causes of mathematics success/failure. The scale consisted of two sections. The first section represents what attributions students make when they are successful in their academic areas. Students were asked to indicate the degree of effect each perceived cause has on their success. Statements regarding reasons for being successful and doing poorly were listed, and students were instructed to rate each statement on a scale of four, ranging from "very important (a value of 4)'' to "unimportant (a value of 1)'' when the items are phrased positively. The items measured internal attributions (ascribing the cause of failure or success to personal dispositions, traits, abilities, and feelings), and external attributions (ascribing the cause of success/failure to situational demands, and environmental constraints). The scale consists of 20 items with a reliability of 0.81 measured by coefficient alpha and a standard error of 3.45.

b. Self-Efficacy Scale

The self-efficacy scale was adopted from the work of Yalew (2003) and used to measure the mathematics academic self-efficacy perceptions of students. The scale consisted of 10 items rated on a 6- 6-point rating scale ranging from "always true of me" (a weight of 6) for an idea that indicated a high self-efficacy level to " never true of me" (a weight of 1) for an idea indicating low self-efficacy level when the items were phrased positively. Some items phrased negatively were reverse-scored. It was used with little modifications on its scaling. The reliability as estimated by coefficient alpha was 0.725.

c. Expectation scale

The mathematics expectation scale employed for this study was developed by the researcher based on the review of related literature. Initially, 21 items were developed. However, through revision based on the comments of the reviewers, 14 items were retained and seven items were excluded. Finally, the scale consisted of 14 items and its purpose was to assess students' beliefs about mathematics subject in relation to their expectations for success, how hard they think the subject was for them, how interesting activities were, how important was being good at math activities to them, and how useful they think are the activities.

The scale was framed with a 5-point rating scale ranging from strongly agree (a weight of 5 indicating high expectation for success) to strongly disagree (a weight of 1 indicating low expectation for success). The reliability as measured by coefficient alpha was 0.761

d. Mathematics Achievement Test

The Mathematics Achievement Test which consisted of multiple-choice items was developed by mathematics teachers. Pilot testing was carried out on 25 students of whom 11 students were males and the rest 14 students were females. Those sampled for pilot studies were not involved in the actual survey. This process was necessary for verifying the time allocated and any ambiguities to the test items.

The content validity of the mathematics test was established by the use of a table of specification after which two other experts in the subject were used to ascertain the face and content validity of the mathematics test. Kothari (2004) notes that validity is the extent to which a measuring instrument provides adequate coverage of the topic under study; if the measurements contain a representative sample, then content validity is addressed. The suggestions made by the experts were used to revise the instruments before collecting data.

With regard to the reliability of the instrument, it was determined using Kuder Richardson's (K-R) formula 20 estimates. The reliability coefficient of the instrument was 0.89. Since 0.667 indicates an acceptable reliability coefficient (Jackson, 2003), the coefficients of all sections were found to be reliable hence the questionnaire used in this study as the main data collection tool was reliable.

From the results obtained in the item analysis, the items were categorized under level of difficulty. Out of the 70 items tested, 10 were found to be too difficult, 40 items were moderately difficult and 20 were considered to be too simple for the sample participants. The 40 moderately difficult items were used as a measure of achievement.

Data Collection Procedures

Before the actual administration of research instruments and data collection, the researcher visited the school to verbally explain the purpose of the study. The researcher discussed with mathematics teachers and sought for their assistance towards test development, administration, and collection of students' test items. A total of 168 students did the Students Mathematics Achievement Test and filled out the self-report questionnaire. This was done at a time after the school authority and the researcher agreed upon. The instruments were administered by the researcher, following an appointment with homeroom teachers.

The study used primary data obtained by implementing the mathematics achievement test in the sampled students. The test was administered to all the participants in the school at the time scheduled. Marks obtained from the sample students were used as the primary data in the study.

To make the items clear and avoid difficulty of understanding for the students all the questionnaire were translated into Tigrigna by the researcher. After the translation was completed, a critique was made by two language experts. Based on this feedback, a pilot study was conducted. Its purpose was to check the appropriateness of the items in the instrument, to identify ambiguities in the instructions, and to make necessary corrections based on the obtained feedback from the respondents. Statements were phrased positively and negatively to increase reliability and reduce response style effects.

After distributing the questionnaire, students filled them out as requested and directed by the researcher. The respondents were given instructions, and they were assured of confidentiality and anonymity; after that, they were given enough time to fill in the questionnaire. The researcher then collected the completed questionnaire with the assistance of the schoolteachers.

Data analysis

After the data were collected and screened for errors, they were entered into a computer. Before analysis, the negative statements in the motivational items were reversely coded. The scores for self-efficacy, expectations, and attribution were calculated by summing the scores for all the items, respectively. The responses of each respondent were entered into SPSS version 16. Finally, the data were analyzed using appropriate descriptive and inferential statistics.

Results

This study intended to examine the extent to which academic self-efficacy, expectations, and causal attributions for success and failure contribute to mathematics achievement differences between male and female learners of primary schools. Independent sample t-test was used to compare their mean score differences. Pearson product-moment correlation coefficient was also employed to examine the interrelationships of the variables. Finally, multiple regression analysis, R^2, was used to see the individual and composite contributions of self-efficacy, expectations, and attributions to the variance in students' mathematics achievement.

Table 1: *Gender Differences on the Variables Treated in the Study*

Variables	Males (n = 82)		Females (n = 80)		t-values
	X	SD	X	SD	
Expectation	38.429	2.58	38.15	3.216	0.606
Self-efficacy	55.15	4.562	52.15	4.859	3.995*
Attribution	65.095	5.83	61.75	5.098	3.858*
Achievement	64.476	8.779	58.85	9.195	3.959*

**P<0.05*

As it is shown in Table 1, the variables treated: expectation, self-efficacy, attribution, and current mathematics achievement with their mean scores of male and female students were compared. The result of the table displayed that with the exception of 'expectation', other variable means of male students are higher than female students. The differences were statistically significant ($t = 3.995$, $p<0.05$ for self-efficacy; $t = 3.858$, $p < 0.05$ for attribution; and $t = 3.959$, $p < 0.05$ for mathematics achievement).

Therefore, boys significantly scored higher means than girls in self-efficacy, attribution, and mathematics achievement. However, this research result proved that boys and girls showed no significant mean differences in their expectations about mathematics achievement.

Table 2: *Gender Difference in Attributions of Success and Failure Based on their Math Achievement*

	Gender						
	Males			Females			
Attributions for success	X	SD	n	X	SD	n	t-values
Ability	9.14	1.15	32	7.85	1.46	20	3.554*
Lack	7.48	1.25	20	6.65	1.57	14	1.718
Effort	7.91	1.22	16	7.25	1.12	31	1.854
Task difficulty	6.49	1.49	14	6.00	1.34	15	0.933
Attributions for failure	X	SD	n	X	SD	n	t-values
Ability	7.24	1.27	30	7.7	1.61	31	1.24
Luck	7.20	1.25	22	7.45	1.32	19	0.619
Effort	6.00	1.05	15	6.35	0.87	16	1.009
Task difficulty	6.43	1.49	15	6.20	1.19	14	0.457

*P<0.05

As it is shown in Table 2, there was a difference in the mean score of attribution of success to 'ability' between successful males and successful females. This difference was found to be statistically significant ($t = 3.554$, $p<0.05$). From the table, male students attribute their success in math to their ability. As to the other causal attributions, the two genders did not show significant variation.

Similarly, perceived causes for the failure of males and females were also examined. However, the mean difference was found to be not statistically significant.

Table 3: *Intra-gender Differences in Causal Attributions for Successes and Failures*

Attributions		Gender					
		Males			Females		
		X	SD	t-values	X	SD	t-values
Ability	Success	4.14	1.15	2.698*	2.85	1.46	0.917
	Failure	3.48	1.27		3.50	1.61	
Lack	Success	3.48	1.25	0.508	2.65	1.57	-
	Failure	3.20	1.25		3.43	1.32	1.233
Effort	Success	3.91	1.22	2.792*	3.25	1.12	-
	Failure	3.00	1.05		3.35	0.875	0.224
Task difficulty	Success	2.29	1.49	0.213	2.00	1.34	-
	Failure	2.43	1.49		2.20	1.19	0.351

*P<0.05

As it is shown in Table 3, the main interest was to see whether students with the same gender on the same achievement status differ in their causal attributions. From the table, male students assumed their success was more attributable to their ability ($t = 2.698$, $p < 0.05$) and to their effort ($t = 2.792$, $p<0.05$). With regard to females no significant difference was obtained on their causal attributions of success and failure.

Table 4: *Intercorrelations among Variables*

Variables	**1**	**2**	**3**	**4**
1. Math achievement	--			
2. Self-efficacy	0.8039*	--		
3. Attribution	0.6818*	0.085	--	
4. Expectation	0.5956*	0.743*	0.073	--

*P<0.05

Correlation of self-efficacy, attributions, and expectations with mathematics achievement and intercorrelations of the variables were computed. Results showed that except for the correlation between self-efficacy and attribution ($r = 0.085$), and attribution and expectation ($r = 0.073$), which were non-significant, all others were significant at $\alpha = 0.05$. The correlation between self-efficacy and math achievement ($r = 0.8039$) was strongly and positively correlated. The correlation between attribution and math achievement ($r = 0.6818$), expectation and math achievement ($r = 0.5956$), and self-efficacy and expectation ($r = 0.743$) were also positively correlated and significant.

Table 5: *Contribution of the variables for variations in math achievement for male and female students (n = 162)*

Variables	Coefficients (b)	ß	Contribution (R^2) in %	t-test	R^2	Adjusted R^2
Self-efficacy	0.763	0.6606	53.11	2.792*		
Attribution	0.4890.132	0.3251	22.22	1.789*	0.8165	0.8130
Expectation		0.1061	6.32	0.483		

$F=54.878$, $df_1 =3$, $df_2=158$, *P<0.05

As shown in Table 5, multiple regression analyses for self-efficacy, attribution, and expectation variables were computed to see their individual and composite effects on math achievement.

The total coefficient of determination (R^2) indicated that the composite effect of these variables on mathematics achievement differences was 0.8165. That means 81.65% of the total variability in

mathematics achievement in males and females was explained by the three variables (self-efficacy, attribution, and expectation). The contribution of self-efficacy was more significant (i.e., 53.11%

or 65.09% of R^2) followed by attribution, 22.22% or 27.21% of R^2). The coefficient of determination (R^2) was also found to be significant ($F = 54.878$, $p<0.05$, $df_1 =3$, and $df_2=158$).

Discussion

The present study was undertaken to examine if there was a significant difference between male and female students in their expectations, self-efficacy, attributions, and mathematics achievement. Results of the independent sample t-test showed that boys significantly scored higher means than girls in self-efficacy, attribution, and mathematics achievement.

The possible reasons and explanations for this difference have been given by different researchers. For example, Eccles (1989) stated that parents and teachers have lower expectations and valuations of female performance in mathematics than males. Parents have gender stereotypic expectations about math achievement and valuation (Kangethe, Lyria & Nyamanga, 2014) and these are communicated to daughters. Thus, it could not be a surprise if females' self-efficacy, attribution, and achievement levels are lower than their counterparts for the fact that they feel they are not expected to achieve high status as males do.

On the other hand, this research result proved that boys and girls showed no significant mean differences in their expectations about their mathematics achievement. This result deviated from the existing literature. This might be because the expectation patterns of students might change over time.

As can be seen from Table 2, an attempt was made to see the attribution style of successful males and females, and failed males and females. The result showed that successful males attribute their success to their ability. This result was in agreement with the research reports by other researchers (e.g., Bingley, Lazowski & Hulleman, 2016; Schunk & Greene, 2018). Similarly, perceived causes for the failure of males and females were also examined. However, the result was found to be not statistically significant.

Furthermore, an attempt was made to compare successful and failed students within the same gender on the sources of causal attribution for success and failure. Accordingly, successful males attributed success to ability and effort as compared to failed males. On the other hand, no statistically significant difference was observed between successful females and failed females.

Several studies have found that when individuals are asked to give the subjective reasons for their academic performance, whether good or bad, students tend to pinpoint factors within themselves (e.g., ability, effort, traits, and dispositions) or factors outside themselves (e.g., luck, ease or difficulty of the task, and help from teachers). An attribution pattern in which a student internalizes success and externalizes failure has long been thought to be beneficial academically and important

in explaining success (Williams & Williams, 2010). For example, Gorgeous (1991) has found that children's attributions to effort, ability, and other internal factors were related positively to academic achievement; whereas, attributions to luck and external factors were related negatively to achievement.

The total coefficient of determination (R^2) for self-efficacy, attribution, and expectations indicated that the contribution of differences in self-efficacy belief in the two sexes to their mathematics achievement was by far the greatest one followed by attribution. It is evident that students' differences in mathematics achievement can be mainly accounted for by differences in their feeling of competence.

Correlational analyses also indicated that self-efficacy had high and positive relationships with achievement which suggests that high self-efficacy could positively affect students' mathematics achievement. Research results revealed that the perceptions students hold about themselves and about their academic competence, help determine what they do with the knowledge and skills they possess (Pajares & Valiante, 1999), and influence their choice of activities, effort expended, task persistence, and task accomplishment (Williams & Williams, 2010).

Conclusion and implications

As it is clearly shown in the result section, all the variables raised in the study were positively related to each other except between attribution and expectation which is positive but weak and insignificant. Furthermore, the study has indicated that there is a gender difference in mathematics achievement between male and female students. This indicates that the variables treated in the study have contributed to the difference in the math achievement of the students. Females' relatively lower self-efficacy and lower mathematics achievement scores indicate that school curricula and other programs should be designed in a way to help improve female's beliefs about their own competence in mathematics and reduce their level of anxiety in dealing with mathematics-related tasks. For example, adapting the cognitive level of mathematical tasks to students' needs, interests and skills could be a viable way to help females as well as males find some value in learning mathematics and improve their self-beliefs. Lastly, teacher education programs should be designed in a way to help teachers understand the fact that all students can enjoy and do mathematics. The classroom environments should promote the substantial participation of all students regardless of their gender.

Finally, although the present study provided interesting findings that contribute to the literature and teaching practices, there is still more to do. Conducting comparative studies investigating both cognitive and non-cognitive constructs is necessary to better understand how various variables interact in different cultures. Furthermore, it is suggested that future studies may consider interviewing some of the participants about reasons for low self-beliefs and low mathematics

achievement. Such studies may uncover some of the causes of individuals' self-beliefs and emotions in learning mathematics.

Acknowledgments

I am deeply indebted to Adi Haqi primary school students for their participation in this study. I would also like to extend my special thanks to the mathematics teachers who developed and edited the mathematics achievement test.

Cite this article as:

Molla Haftu Shaine. (2021). Motivational and Mathematics Achievement Differences of Male and Female primary School Students**.** *Journal of Educational and Behavioural Sciences,* 4(1),34-49.

References

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175-1184.

Bieg, M., Goetz, T., Wolter, I., & Hall, N. C. (2015). Gender stereotype endorsement differentially predicts girls' and boys' trait-state discrepancy in math anxiety. *Front. Psychol.* 6(14), 276-297.

Bingley, U. K., Lazowski, R. A., & Hulleman, C. S. (2016). Motivation interventions in education: A Meta-analytic review. *Review of Educational Research*, 86, 602–640.

Cleary, T., & Kitsantas, A. (2017). Motivation and self-regulated learning influences on middle school mathematics achievement. *Psychology Review*, 46, 88–107.

Conley, A. (2012). Patterns of motivation beliefs: Combining achievement goal and expectancy-value perspectives. *Journal of Educational Psychology*, 104(1), 32–47.

Eccles, J.S. (1989). Bringing young women to math and science. In M. Crawford & M. Gentry (Ed.). Gender *and thought* (p. 36-58). New York, NY: Springer-Verlag.

Endawoke, Y.(2003). ''Causes of student attrition in Bahir Dar University: qualitative and quantitative analysis'', *The Ethiopia Journal of Education*, 113(1), 31-66.

Gay, L. (1996). *Educational Research*: *Competencies for analysis and application* (5th Ed.). NY. Merrill.

Gorgeous, S. (1991). "Achievement attributions of sixth-grade children and their parents" *Educational psychology*, 19, 399-412.

Guo, J., Parker, P. D., Marsh, H. W., & Morin, A. J. (2015). Achievement, motivation, and educational choices: a longitudinal study of expectancy and value using a multiplicative perspective. *Developmental Psychol.* 51, 1163–1176.

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review*, 17, 63–84.

Hyder, A., & Kessels, U. (2013). Is School feminine? Implicit gender stereotyping of school as a predictor of academic achievement. *Sex Roles*, 69,605-617.

Hyde, J. S. (2014). Gender similarities and differences. *Annu. Rev. Psychol.* 65, 373–398.

Joët, G., Usher, E., & Bressoux, P. (2011). Sources of self-efficacy: An investigation of elementary school students in France. *Journal of Educational Psychology*, 103(3), 649-6.

Kangethe, N. S., Lyria, K. S., & Nyamanga, A. M. (2014). The gender socialization question in education: influence on boys' and girls' academic achievement. *European Scientific Journal*, 10(19), 279-294.

Kothari C.R., (2004). Research methodology: Methods and techniques, 2nd ed., New Delhi: New Age International limited publishers.

McClure, J., Meyer, L., Garisch, J., Fischer, R., Weir, K., & Walkey, F. (2011). Students' attributions for their best and worst marks: Do they relate to achievement? *Contemporary Educational Psychology*, 36(2), 71–81

Ministry of Education (MoE). (2001). Education statistics Annual Abstract 2000/1, Addis Ababa, Ethiopia

Ministry of Education (MoE). (1999). Indicators of the Ethiopian Education System, Addis Ababa, Ethiopia

Ministry of Education (MoE). (1994). New Education and Training Policy, Addis Ababa, Ethiopia

Pajares, F., & Valiante, G. (1999). "Grade level and gender differences in the writing self‐beliefs of middle school students" *Contemporary Educational Psychology, 24,* 390‐405.

Randhawa, B.S. (1991). "Gender differences in academic achievement: A close look at Mathematics" *The Alberta Journal of Educational Research,* 3, 7,241 -257.

Schunk, D. H. (2012). Social cognitive theory. In K. R. Harris, S. Graham, & T. Urdan (Eds.), Educational psychology handbook: Vol. 1. Theories, constructs, and critical issues (pp. 101–123). Washington, DC: American Psychological Association.

Schunk, D. H., & DiBenedetto, M. K. (2016). Self-efficacy theory in education. In K. R. Wentzel, & D. B. Miele (Eds.). Handbook of motivation at school (pp. 34–53). (2nd Ed.). New York: Routledge.

Schunk, D. H., & Greene, J. A. (Eds.). (2018). Handbook of self-regulation of learning and performance (2nd ed.). New York: Routledge.

Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). Motivation in education: Theory, research, and applications (4th ed.). Boston: Pearson Education.

Shkullaku, R. (2013). The relationship between self–efficacy and academic performance in the context of gender among Albanian students. *European Academic Research*, 1 (4), 467-478.

Tamirie, A. (1997). Attributions and academic achievement of education, medicine and polytechnic freshman students in Bahir Dar. *The Ethiopian Journal of Education*, XVII (2), 63-78.

Vecchione, M., Alessandri, G., & Marsicano, G. (2014). Academic motivation predicts educational attainment: Does gender make a difference? *Learning and Individual Differences*, 32 (1), 124-131.

Weiner, B. (2010). The development of an attribution-based theory of motivation: A history of ideas. *Educational Psychologist,* 45, 28–36.

Wigfield, A., Tonks, S. M., & Klauda, S. L. (2016). Expectancy-value theory. In K. R. Wentzel, & D. B. Miele (Eds.). Handbook of motivation at school (pp. 55–74). (2nd Ed.). New York: Routledge.

Whitaker, M., & Dempsey, K. (2013). School influences on parents' role beliefs. *Elementary School Journal*, 114(1), 73-99.

Williams, T., & Williams, K. (2010). Self-efficacy and performance in mathematics: Reciprocal determinism in 33 nations. *Journal of Educational Psychology*, 102, 453–466.

Zewdie, G. (1998). "Women in education: A study of the academic performance and participation of female students in the high school of Addis Ababa region", *IER Flambeau,* 6(1), 26-53.