ISCE: Journal of Innovative Studies on Character and Education
ISSN 2523-613X
Volume 7 issue 2, Year 2023
Journal homepage: http://iscjournal.com/index.php/isce

THE INFLUENCE OF PORTUGUESE LANGUAGE MASTERY AND LEARNING MOTIVATION ON MATHEMATICS LEARNING ACHIEVEMENT

Agosto Olo Tomé[1*], Rui Alegria[2], Marciano da Silva Soares[3], Helena Mariano de Fátima[4], Augusto da Costa[5]
Mathematics Education, Instituto Superior Cristal, Timor-Leste[1,2,4,5]

A R T I C L E I N F O

Article history:
Received: 28-11-2023
Accepted: 11-12-2023
Published: 17-12-2023

Keyword:
achievement,
portuguese language,
mathematics

A B S T R A C T

The purpose of this study was to ascertain whether students' achievement in learning mathematics was influenced, either partially or simultaneously, by their mastery of the Portuguese language and their motivation to learn. 61 students were sampled for this research. Observation, surveys, and documentation are data collection methods; Validity and reliability tests, normality, linearity, and regression are methods for analyzing data. The findings of this study show that the research instruments are valid and reliable, and the data are normal and linear. The hypothesis test from the F test obtained the value of F test = 81.740 > F table = 3.156 which indicates that learning motivation and mastery of Portuguese have an influence on student achievement. Hypothesis testing from the t-test of Portuguese language mastery and student learning achievement shows that t-test = -1.369 < t table = 2.002, while student motivation and learning achievement shows that t-test = 10.693 > t table = 2.002. So, it was concluded that mastery of Portuguese did not affect student achievement while learning motivation affected student learning achievement.

INTRODUCTION

Activities like teaching and learning are unique to schools since teachers and students are two parts that are not separate from one another. According to Silalahi and Hutauruk (2020), the goal of communication between teachers and students

* Corresponding author.
E-mail addresses: Oloagus12@gmail.com (Agosto Olo Tomé)

throughout the teaching and learning process is to articulate ideas to accomplish learning objectives. This communication does not ignore how language works since language is a comprehensive and helpful instrument for communicating thoughts, feelings, and behaviors to others.

According to Mailani et al. (2022), language is the most efficient communication tool for expressing ideas, sentiments, and objectives to others. It may also foster collaboration among individuals, increasing the importance of language in daily interactions. On the other hand, according to Uktolseja et al. (2019), it refers to the system of communication that uses arbitrary vocational symbols as well as the means of communication between members of society.

According to Article 13, paragraph 1 of the Constitution of the Democratic Republic of Timor Leste, Tetum and Portuguese are the two official languages in Timor Leste. In addition, it is also stated in the law of the education system in Chapter 2 Article 8, that the language in the Timor Leste education system is Tetum and Portuguese.

Portuguese is the language designated as the official language in the Republic of Timor Leste. Therefore, in learning activities, this language is also taught as a separate subject and as an introduction to other subjects. But reality shows that this language is not easy for students to understand, both in studying the language and in other subjects. In learning activities, Portuguese and mathematics were two disciplines learned from elementary to secondary school. Observations conducted by researchers noted that the students had little interest and willingness to follow the mathematics learning process introduced in the Portuguese language.

Mathematics is an essential subject in the education World. Therefore, this subject has been being learned by students since elementary school. According to Sinaga et al. (2021), Mathematics is the basis for all other areas of knowledge. Therefore, it is meaningful for everyone, especially students, to study and understand it. Mathematics will be easy to learn if students have motivation. With motivation, student enthusiasm, interest, and willingness can be stimulated to learn throughout the learning process. On the other hand, motivation is also a force that drives students. Therefore, there needs to be attention to students who need this assistance.

Motivation is a force that creates enthusiasm in carrying out something. Motivation can come from the individual himself or from outside. According to Rafiola et al. (2020), motivation is a force that students possess that propels them to engage in learning activities, guarantees that those activities continue, and offers guidance for those actions

so that they may accomplish the objectives of the learning subjects.

Learning achievement is the result achieved by students in the form of knowledge, skills, and attitudes. All of this is achieved through experience and training that individuals have gone through. According to Rasanti et al. (2023), learning achievement is the result obtained from students after interacting with their environment. In connection with the problems above, this research aims to determine whether or not there is an influence of Portuguese language mastery and learning motivation on students' mathematics learning achievement.

METHOD

This research is quantitative research with a comparative causal type. According to Afif et al. (2023), this research type aims to conclude whether there is a causal relationship between the variables studied. This research was conducted at Cristal Senior High School. The population in this survey was 182 students divided into three classes. The sampling technique used was probability with cluster sampling so that the sample in the study was 61 students taken from one class. The data analysis techniques are tests of validity and reliability, normality tests, and linearity tests. Next, to analyze the influence, researchers used regression analysis. The collected data was analyzed using SPSS version 21.

RESULT AND DISCUSSIONS

Result

Respondent Characteristics

There were 61 respondents in this study, consisting of 31 women (50.82%) and 30 men (49.18%). Based on religion, respondents are generally Catholic. The results of data collection also show that 3.3% of students are 15 years old, 11.5% of students are 16 years old, 54.1% of students are 17 years old, 26.2% of students are 18 years old, 3.3% of students are 19 years old years, and 1.6% of students are 20 years old. The following is an explanation of the gender, religion, and age of the respondents:

No	Gender	Frequency	Percentage	Religion
1	Female	31	50.82%	Catholic
2	Male	30	49.18%	
Total		61	100 %	

Table 1: Distribution of Respondents Based on Gender and Religion

No	Age	Frequency	Percentage
1	15	2	3.3%
2	16	7	11.5%
3	17	33	54.1%
4	18	16	26.2%
5	19	2	3.3%
6	20	1	1.6%
Total		61	100 %

Table 2: Distribution of Respondents Based on Age

Validity and Reliability Test

59 respondents took part in the instrument tryout. The tryout results showed that the instruments and questions used were valid and reliable because the value of the r-test was more than the r-table. The results of the validity and reliability tests are explained in the following table:

No	Portuguese Language Mastery		Learning Motivation		Mathematics Learning Achievement		Table Value	Decision
	Validity Test	Reliability Test	Validity Test	Reliability Test	Validity Test	Reliability Test		
1	1	0.810	1	0.818	1	0.821	0.256	Valid and reliable
2	0.559	0.810	0.673	0.818	0.727	0.821	0.256	Valid and reliable
3	0.854	0.810	0.862	0.818	0.881	0.821	0.256	Valid and reliable
4	0.392	0.810	0.535	0.818	0.618	0.821	0.256	Valid and reliable
5	0.540	0.810	0.631	0.818	0.658	0.821	0.256	Valid and reliable

Table 3: Result of validity and Reliability Test

Prerequisite Test

This test consists of normality and Linearity tests. The result shows that the X^2-test is less than the X^2-table, and the normality test results demonstrate that the data from the three variables have a normal distribution. However, the linearity test also shows that the data are linear. Both between variables X1 and Y and X2 and Y. Because the F-test is less than the F-table. The following table shows the results of the normality and linearity tests.

Portuguese Language Mastery	Learning Motivation	Mathematics Learning Achievement	X^2-table
Normality test (X^2-test)	Normality test (X^2-test)	Normality test (X^2-test)	
13.590	9.000	17.721	22.362

Table 4: Normality Test

Mathematics Learning Achievement and Portuguese Language Mastery		Mathematics Learning Achievement and Learning Motivation	
F-test	F-table	F-test	F-table
1.887	1.935	1.321	1.935

Table 5: Linearity Test

Hypothesis Testing

Partial test (t-test)

A t-test (partial test) was used to examine the relationship between learning motivation (X2) and mastery of the Portuguese language (X1) on mathematics learning achievement (Y). In this research, 5% of the significance criteria were applied by comparing the value of the t-test with the t-table. The following are the criteria:

1) If t-test < t-table: accept H0 and reject H1

2) If t-test > t-table: accept H1 and reject H0

The t-table value was decided by finding df = n-2 = 61-2 = 59. So, the t-table value is 2,001. Following are the results from the partial test examined using SPSS Program version 21:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.944	1.360		3.635	.001	2.221	7.667
	Portuguese Language Mastery	-.120	.088	-.119	-1.369	.176	-.295	.055
	Learning Motivation	.827	.077	.930	10.693	.000	.672	.982

a. Dependent Variable: Mathematics Learning Achievement

Table 6: Coefficients

The results in the table above show that the value of the t-test is -1.369. If these results compare with the value of the t-table, then t-test < t-table or -1.369 < 2.001, so that H0 is accepted and H1 is rejected, it means that partial mastery of the Portuguese language does not affect mathematics learning achievement.

The results in the table above show that the t-test is 10.693. If these results compare with the value of the t-table, then t-test > t-table or 10.693 > 2.001. So that H1 is accepted and H0 rejected, it means that partial learning motivation affects mathematics learning achievement.

Simultaneous test (F-test)

Testing the influence of Portuguese Language Mastery (X1) and Learning Motivation (X2) on mathematics learning achievement (Y) was carried out through F-test (simultaneous test). In this research, 5% of the significance criteria were applied by comparing the value of the F-test with the F-table. The following are the criteria: If F-test < F-table: accept H0 and reject H1. If F-test > F-table: accept H1 and reject H0. The F-table value was decided by finding df = n-k = 61-2 = 59. So, the F-table value is 2,001. Following are the results from the simultaneous test examined using SPSS Program version 21

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	583.530	2	291.765	81.740	.000[b]
	Residual	207.027	58	3.569		
	Total	790.557	60			

a. Dependent Variable: Mathematics Learning Achievement
b. Predictors: (Constant), Learning Motivation, Portuguese Language Mastery

Table7: ANOVA[a]

The results in the table above show that the value of the F-test is 81.740. If these results compare with the value of the F-table, then the F-test < F-table or 81.740 > 3.156. So that H1 is accepted and H0 rejected, it means that simultaneous Portuguese language mastery and learning motivation affect mathematics learning achievement.

Discussion

According to Budiastuti and Bandur (2018), the validity and reliability test is a step that needs to measure the extent to which a study is reliable. Therefore, in this research, we first test the validity and reliability of the research instrument. The test shows that the instrument and question items are valid and reliable. It is because the value of Pearson Correlation and Cronbach's Alpha are more than the value r-table.

The pre-criteria tests consist of normality and linearity tests. The results show that variables of Portuguese language mastery, learning motivation, and mathematics achievement were in the normality and linear categories. According to Akbar (2018), normality data is a requirement that must carried out before statistical tests. Data normality testing is needed so that researchers can determine what types of statistics to use. On the other hand, according to Kahasanah (2021), linearity testing is a crucial test in regression analysis.

The hypothesis test results from the F test show that the simultaneous variables of Portuguese language mastery and student learning motivation have a significant influence on students' mathematics learning achievement. According to Mucubo (2022), lack of motivation to learn mathematics and students' views on mathematics are some of the factors that have a negative influence on the teaching and learning process. On the other hand, the spoken or written language of mathematical statements must be accessible to students because it is a key to increasing student interest and motivation. Besides that, it is also a link with mathematics learning.

The Portuguese written or oral language has a principal role in mathematics as in other areas of knowledge. But it can also make it difficult for students to solve problems such as mathematics. The results of hypothesis testing in the t-test show that mastery of Portuguese does not affect student learning achievement, but students learning motivation influences student learning achievement. According to Lorensatti (2009), the components of the Portuguese language and mathematics curriculum are often not connected. This problem seems to be a significant point in mathematics education.

Mathematics and Portuguese are two important materials to teach to students (Bezerra & Novaes, 2020). A standard knowledge of Portuguese is essential for mathematics teaching. This can make it possible and easy for students to understand and know about it, and on the other hand, it can make it easier for teachers to

interpret and explain mathematics (Barboza & Kapitango-a-Samba, 2021).

Studies on the influence of learning motivation on learning achievement show that learning motivation influences student mathematics learning achievement. For example, in Indonesia, studies were conducted by Novianti et al. (2020) and Winata and Friantini (2019). In addition, learning motivation is also correlated with the student's mathematics learning achievement (Wijayanti & Widodo, 2021).

CONCLUSIONS

Conclusion

Based on the findings, the researchers concluded that when the variable of Portuguese language mastery and student learning motivation takes place together or simultaneously, it will influence student mathematics achievement. However, partially variable Portuguese language mastery does not influence student mathematics achievement, and the learning motivation has influences.

Recommendation

Based on these findings, researchers provide recommendations, as follows:

1. Students (a) Always study hard so you can achieve better mathematics learning achievements. (b) Don't consider Portuguese as an obstacle to learning mathematics.
2. Teacher. Deliver material using Portuguese properly and correctly so that students can understand mathematics.
3. School. Looking for the best way or alternative for students to improve their knowledge in Portuguese and mathematics.

REFERÉNCES

Afif, Z., Azhari, D. S., Kustati, M., & Sepriyanti, N. (2023). Penelitian Ilmiah (Kuantitatif) Beserta Paradigma, Pendekatan, Asumsi Dasar, Karakteristik, Metode Analisis Data Dan Outputnya. *INNOVATIVE: Journal Of Social Science Research*, *3*(3), 682–693.

Akbar, N. (2018). Uji Normalitas Data untuk Penelitian. In *Jayapangus Press*. Jayapangus Press.

Barboza, I. A. F. da C., & Kapitango-a-Samba, K. K. (2021). Percepções dos professores de

matemática sobre a importância da língua portuguesa no ensino-aprendizagem da matemática. *Educação Em Análise*, *6*(2), 369–388. https://doi.org/10.5433/1984-7939.2021v6n2p369.

Bezerra, H. S. N., & Novaes, T. D. de. (2020). Transdisciplinaridade entre Língua Portuguesa e Matemática no Processo de Ensino e Aprendizagem: Relato de Experiência em Escola da Rede Privada em Natal (RN). *Revista Brasileira de Educação Básica*, *5*(16), 1–12. rbeducacaobasica.com.br.

Budiastuti, D., & Bandur, A. (2018). VALIDITAS DAN RELIABILITAS PENELITIAN Dilengkapi Analisis dengan NVIVO, SPSS, dan AMOS. Jakarta: Mitra Wacana Media.

Kahasanah, U. (2021). *Analisis Regresi* (Budy Asyhari (ed.); Cet. 1). UAD Press.

Lorensatti, E. J. C. (2009). Linguagem matemática e Língua Portuguesa: diálogo necessário na resolução de problemas matemáticos. *Conjectura*, *14*(2), 89–99.

Mailani, O., Nuraeni, I., Syakila, S. A., & Lazuardi, J. (2022). Bahasa Sebagai Alat Komunikasi Dalam Kehidupan Manusia. *Kampret Journal*, *1*(2), 1–10. https://doi.org/10.35335/kampret.v1i1.8.

Mucubo, N. L. (2022). *Factores que Influenciam no Aproveitamento Pedagógico dos alunos da 10ªclasse na Disciplina de Matemática: Caso da Escola Secundária da Machava Sede (2018-2020)* (Issue Janeiro). Universidade Eduardo Mondlane.

Novianti, C., Sadipun, B., & Balan, J. M. (2020). Pengaruh Motivasi Belajar Terhadap Hasil Belajar Matematika Peserta Didik. *Science, and Physics Education Journal (SPEJ)*, *3*(2), 57–75. https://doi.org/10.31539/spej.v3i2.992.

Rafiola, R. H., Setyosari, P., Radjah, C. L., & Ramli, M. (2020). The effect of learning motivation, self-efficacy, and blended learning on students' achievement in the industrial revolution 4.0. *International Journal of Emerging Technologies in Learning*, *15*(8), 71–82. https://doi.org/10.3991/ijet.v15i08.12525.

Rasanti, N., Tabroni, I., Suprianto, & Wahyuni, D. (2023). Increasing Motivation and Learning Achievement of Fiqh Through the STAD Type Cooperative Learning Model. *Indonesian Journal of Applied and Industrial Sciences (ESA)*, *1*(1), 29–36. https://doi.org/10.55927/ esa.v1i1.2573.

Silalahi, T. F., & Hutauruk, A. F. (2020). The Application of Cooperative Learning Model

during Online Learning in the Pandemic Period. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal): Humanities and Social Sciences*, *3*(3), 1683–1691. https://doi.org/10.33258/birci.v3i3.1100.

Sinaga, W., Parhusip, B. H., Tarigan, R., & Sitepu, S. (2021). Perkembangan Matematika Dalam Filsafat dan Aliran Formalisme Yang Terkandung Dalam Filsafat Matematika. *SEPREN: Journal of Mathematics Education and Applied*, *02*(02), 17–22.

Uktolseja, L. J., Sujaja, H., & Matinahoru, M. (2019). A Contrastive Analysis Between English and Indonesian Kinds of Sentences. *IJET (Indonesian Journal of English Teaching)*, *8*(1), 54–61. https://doi.org/10.15642/ijet2.2019.8.1.54-61.

Wijayanti, N., & Widodo, S. A. (2021). Studi Korelasi Motivasi Belajar terhadap Hasil Belajar Matematika Selama Daring. *Journal of Instructional Mathematics*, *2*(1), 1–9. https://doi.org/10.37640/jim.v2i1.849.

Winata, R., & Friantini, R. N. (2019). Pengaruh Motivasi Belajar Terhadap Prestasi Belajar Matematika Siswa Kelas VIII SMPN 1 Kuala Behe. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *7*(2), 85–92. https://doi.org/10.25273/jipm.v7i2.3663.