International Journal of Indonesian Education and Teaching
http://e-journal.usd.ac.id/index.php/IJIET
Sanata Dharma University, Yogyakarta, Indonesia

CULTURAL FACTORS IN LEARNING MATHEMATICS: THE CASE ON ACHIEVEMENT LEVEL AMONG BADJAO STUDENTS

Leomarich F. Casinillo[1], Maria Cecilia G. Camulte[2], Darwin L. Raagas[3] and Teresita S. Riña[4]
Visayas State University, Philippines[1]; Bato National High School, Philippines [2];
Hilongos National Vocational School, Philippines [3,4]
leomarich_casinillo@yahoo.com[1], camulte-ecille.nc@gmail.com[2],
darwin_raagas@yahoo.com[3], and teresitarina@gmail.com[4]
https://doi.org/10.24071/ijiet.v4i1.2345
received 3 January 2020; accepted 31 January 2020

Abstract
This study focused mainly on the cultural factors such as beliefs, value practices and exposure to technology-related instructional materials in learning mathematics in regards to their level of achievement among Badjao students. At present, there are limited studies on the learning factors in regards to the level of achievement in mathematics among Badjao students in Bato, Leyte, Philippines. The study employed 71 Badjao elementary and high school students in four selected schools in the municipality of Bato, Leyte using a complete enumeration. Descriptive statistics and Chi-square Contingency Coefficient were used to characterize the variables of interest and to capture its relationships, respectively. Result reveals that the belief of Badjao students is high which indicates that mathematics is important to their daily lives and well-being. However, when it comes to their value practices, Badjao students rated average, which implies that they have mediocre study habits towards mathematics. Findings revealed that almost all of the Badjao students are beginners in their proficiency level in learning mathematics. Result shows that there is a significant relationship between mathematics achievement of the Badjao students and their beliefs about mathematics as well as their value practices in learning mathematics. Furthermore, their level of achievement in mathematics and level of exposure to technology-related instructional materials has no relationships.

Keywords: Badjao students, belief, value practices

Introduction

Badjao people are also known as the "Sea Gypsies" of the Celebes Seas of the Philippines. Apparently, they are scattered along the coastal areas of Tawi Tawi, Sulu, Basilan, and some coastal municipalities of Zamboanga del Sur in the Southern Philippines (Clarke, 2001). Badjao people are found living on houseboats where they make their livelihood solely on the sea as expert fishermen, deep sea divers, and some arenavigators. Seemingly, they come to shore to barter their harvests for farmed produce such as fruits and cassava for daily food consumptions (Bottignolo, 1995). As there population grow large, some of them migrated to Bato, Leyte. Through economic development in the town of Bato, Leyte, several young Badjao was sent to school to obtain an education and to have a decent job later. Unfortunately, these Badjao students are having difficulty in catching up with the lessons due to some factors like socio- economic problem and lack of resources. Especially in learning mathematics, Badjao

students are experiencing shortcomings and negative learning attitudes (Sangcap, 2010). In fact, mathematics pervades life at any age, in any circumstance and its value goes beyond the classroom and as a school subject, therefore, must be learned comprehensively and with much depth (Casinillo and Aure, 2018; Mashile, 2001).

Mathematics makes the life of every human being meaningful. It is one of the tools used in solving a lot of problems that one has encountered in this complicated world. However, Badjao students are struggling in terms of comprehension to the new topics which leads to high failure rate in the subjects. Many studies supports that their level of achievement in mathematics is affected by their learning experiences, beliefs, value practices and exposure to technology-related instructional materials in mathematics (Gbore, 2006; Kunal, 2008, Nathan, 2008; Uslu, 2018). In the province of Leyte, Philippines, Bato is considered as a fourth class municipality which is composed of 32 active barangays. In this municipality, there are several Badjao people who are dwelling and make a living in this place. Economic activities in this municipality focused mostly in agriculture and fishery, thus, most of the Badjao people are considered farmers, however, younger Badjao people are striving for an education. Students from low socio-economic backgrounds often have parents with low level of income and less educational background, are often have negative attitudes toward mathematics (Schuman, 2000; Titu et al., 2008). Also, students in learning environment come from various places with different experiences, beliefs and values. Therefore, they are expected to have different needs, interests and abilities in learning mathematics. In fact, Badjao students must be investigated by stress and their happiness which is very important factor in academic performance (Casinillo and Aure, 2018; Schiffrin & Nelson, 2010).

Hence, this study was conducted from selected public elementary and secondary schools in Bato, Leyte, Philippines. This is to determine if culture really have an impact on students in relation to mathematics achievement. A thorough investigation was conducted to find out the beliefs, value practices and the level of exposure to information technology related instructional materials in learning mathematics in relation to their level of achievements. Furthermore, the purpose of the study is to document and highlight statistically significant relationships between culture and mathematics achievement that might impact the well-being of Badjao students to improve some existing policy in elementary and secondary level of education.

A negative learning attitudes in mathematics is a growing barrier for many students in any educational system (Popham, 2008). Beliefs, values and learning attitudes are taught implicitly rather than explicitly in mathematics classes (House, 2006). It was like an invisible hand, deeply hiding behind an individual's behavioral expression, cognitive process and emotional experience, but deeply affecting the learning process and thus the performance (Chunmei, et al., 2009). According to the study of Hansen (2000), learning is equated to a change in behavior in positive direction and influenced by demographic and cultural backgrounds, and learning environment. Perhaps, students learned by attaching meaning to what they do and need to construct their own meaning of mathematics which is highly influence by cultural background and experiences (Chamberlin, 2009).

According to Meggiolaro (2018), technology has also been shown to help create more authentic learning environments where the students are more motivated to attend, have a greater chance of communication and collaboration and have more opportunitiesto use higher order thinking and problem solving skills connected to real world applications. Prestridge (2012) emphasize that technology is an excellent resource to help connect mathematics to middle school culturally diverse students. Attitude towards technology use is jointly determined by perceived usefulness and perceived ease of use.

The latter influences the behavioral intention to use the technology that – in turn – determines the actual adoption and use of technology. In other words, computers allow students to connect mathematics to real issues in their communities (Uslu, 2018).

Hence, the conceptual framework of this study assumes that the level of achievement in mathematics among Badjao students are influenced by their belief, value practices and exposure to technology-related instructional materials. Generally, the main purpose of this study is to explain the cultural factors of the level of achievement in mathematics. Specifically, this study answers the following objectives: to determine the beliefs of the Badjao students in terms of nature of mathematics, importance of mathematics and on their ability in mathematics; to determine their level of value practices of Badjao students in learning mathematics; to determine the level of exposure of Badjao students to information technology related instructional materials; to determine the level of mathematics achievement of Badjao students; and to determine if there a significant relationship between level of achievement in mathematics among Badjao students and their cultural factors.

Method

The research design of this study was based on the study of Casinillo and Aure (2018), Chunmei et al., (2009) and Titu et al., (2008) that deals with determining the effects of significant factors in the level of achievement in mathematics. Primary data wascollected on beliefs, cultural values, level of exposure to information technology-related instructional materials in mathematics and level of achievement in mathematics using adopted and standardized questionnaires. In describing the data, descriptive measures wasused such as percentages and weighted mean. For further analysis, Chi-square contingency correlation was computed to determine the significant relationships between factors and level of achievement in mathematics.

Prior to the conduct the study, the letter of request was sent to the school principal of the four selected schools of municipality of Bato, Leyte and to some respective advisers where the respondents were studying. The list of Badjao students were asked to the advisers. Since there are only few Badjao students, then the study employed complete enumeration to have better results. Hence, all Badjao students from grades 1 to grade 6 in Dolho Elementary School and all Badjao students from grade 7 to fourth year of Bato National High School, Bato School of Fisheries, and Bato Academy Incorporated were included as respondents of this study. Table 1 shows the distribution of the participants in this study.

Table 1. Distribution of the participants

School of Bato, Leyte	Number of Badjao Students
Dolho Elementary School	48
Bato National High School	15
Bato School of Fisheries	5
Bato Academy Incorporated	3
Total	71

For ethical consideration, Badjao students were oriented on the purposes of the study. The said students were educated that the primary data gathered will be treated withutmost confidentiality and for research purposes only. Further, their participation was strictly voluntary.

In data gathering, the study used the instruments developed by Smith and Good (1984), that is a standardized test questionnaires which is a teacher made test. This instrument consist of three (3) parts. For Part I of the test questionnaires, it was composedof 20-item questions. These determined about the beliefs of the Badjao students towards mathematics subject. The response in this part followed a five-point rating Likert-type scale as follows: 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, and 5-strongly agree. Part II was composed of 10 –item questions which determine the level of value practices of the respondents in learning mathematics. The response in this part also follows a five-point rating Likert-type scale, that is: 1-never, 2-seldom, 3-sometimes, 4- often and 5-always. For Part III, it was composed of 10-item questions which asked about the level of exposure to information technology-related instructional materials ofthe students in mathematics particularly the used of calculator and computers. The first 5 items of the questions were adopted from Portland Community College Calculator Surveyand for the other 5 items of the questions were adopted from the study of Liu and colleagues (2010). The response in Part III also followed a five-point Likert–type scale the same as Part II. The said instruments were validated by the English teachers and Values Education teachers in Bato National High School, Philippines. Pilot testing was done also to test the validity and reliability of the questionnaire. Fortunately, the questionnaires were valid and reliable with reasonable Chronbach's Alpha. In determining the level of achievement of the Badjao students in mathematics, average percentage scores of each student in the first and second periodical examinations was asked by their respective teachers. Table 2 shows the Level of achievement in mathematics and the percentage score intervals.

Table 2. Level of achievement in mathematics and the percentage score intervals.

Level of Achievement in Mathematics	Percentage Score Intervals
Beginner	75-80
Developing	81-85
Approaching proficiency	86-90
Proficient	91-95
Advanced	96-100

After the retrieval of the data, it was encoded, tabulated, analyzed and interpreted using the statistical software called Statistical Packages for Social Sciences (SPSS) version 20. The following are the statistical methods used in this study:

1 *Percentages and Weighted Mean*. This was used to describe the rating of the students to their beliefs, value practices and level of exposure to information technology-related instructional materials. Further, the following methods were used to summarize the level of achievement in mathematics.

2 *Chi-Square Contingency Correlation Coefficient*. This was used to determine a significant relationship between mathematics achievement and beliefs of the respondent in mathematics, significant relationship between mathematics achievement and level of value practices of the respondents in learning mathematics, and significant relationship between mathematics achievement and level of exposure of the respondents to information technology-related instructional materials.

Results and Discussion

In this section, it shows the descriptive measures on the variables of beliefs in the nature, importance, and ability in mathematics. It also shows the summary of value practices towards mathematics, level of exposure to information technology-related materials in mathematics and their level of achievement. Furthermore, this presents the correlation coefficients between level of achievements and cultural factors.

Beliefs in the Nature of Mathematics

Table 3 shows that the first 10 items is about the beliefs of Badjao students on the nature of mathematics. It can be gleaned that, on the average, students agree on their beliefs that getting the right answers is the most important part of mathematics with a weighted mean of 4.10. Badjao students believes that learning mathematics mainly involves memorizing procedure and formulas. Also, they believe that mathematics involves relating many different ideas and it is difficult for them to grasp the mathematical ideas. Perhaps, there common difficulty is taking quizzes and exams in mathematics since they forget relevant formulas and rules during class discussions. However, they strongly disagree on their belief that doing mathematics consists mainly ofusing rules and specific formulas. The grand mean regarding their beliefs on the nature of mathematics is 3.40 with a description that they agree to the indicators on their belief in the nature of mathematics (Table 3). In the study of Kunal (2008), it reveals that the relevance of beliefs as a component of mathematical disposition and their impact on mathematics learning is echoed in the curriculum and evaluation standards.

Beliefs on the importance of Mathematics

On the average, Table 3 shows that Badjao students agree on their beliefs and implies that they study mathematics because they know how useful it is daily lives. It alsoinfers that knowing the concepts of mathematics helps them earn a living someday. However, they disagree on their belief that mathematics is of no relevance to their lives with a weighted mean of 2.35 (Table 3). However, the grand mean concerning to their beliefs on the importance of mathematics is 3.36 with a description that they agree. This result is parallel to the study of House (2006) which investigate beliefs and mathematics achievement.

Beliefs in their Ability in Mathematics

Table 3 also shows the summary of beliefs on their ability in mathematics. It can be gleaned that they agree on their beliefs that if they are presented with a new mathematical situation, they can cope with it because they believe that they have a good experience in mathematics. It also infers that they get flustered if they are presented with a problem different from class discussions. It also reveals that they have more confidence in their ability in mathematics than in their ability in their other subjects. The grand mean pertaining to their beliefs on their ability in mathematics is 3.46 with a description that they agree to their beliefs which is consistent to the study of Sangcap (2010). It is worth noting that the learning outcomes of the students are strongly related to their beliefs and attitude about mathematics (Chunmei et al., 2009).

Table 3. Beliefs of Badjao Students in Learning Mathematics

Item No.	Indicators on Belief in Mathematics	Weighted Mean	Description
	Belief on the Nature of Mathematics		
1	Doing mathematics consists mainly of using rules.	1.00	Strongly Disagree

2	Learning mathematics mainly involves memorizing procedure and formulas.	4.03	Agree
3	Mathematics involves relating many different ideas	3.83	Agree
4	Getting the right answers is the most important part of mathematics.	4.10	Agree
5	Getting good grades in mathematics is more of a motivation than is the satisfaction of learning the mathematics content.	3.48	Agree
6	A common difficulty with taking quizzes and exams In mathematics is that if you forget relevant formulas and rules you are lost.	3.70	Agree
7	It is difficult to talk about mathematical ideas because all of you can really do is explain how to do specific problems.	3.73	Agree
8	Mathematics consists of many unrelated topics.	3.20	Undecided
9	In mathematics there is always a rule to follow.	3.63	Agree
10	The most important part of mathematics is computation.	3.34	Undecided
	Grand Mean	3.40	Agree
	Belief on the Importance of Mathematics		
11	Mathematics is important in my life.	3.85	Agree
12	I study math because I know how useful it is.	3.92	Agree
13	Knowing math will help me earn a living.	3.31	Agree
14	Math is worthwhile and necessary subject..	3.69	Agree
15	Math will not be important to me in my life's work	3.03	Undecided
16	Math is of no relevance to my life.	2.35	Disagree
	Grand Mean	3.36	Agree
	Belief on Students' Ability in Mathematics		
17	I have more confidence in my ability in mathematics than in my ability in other academic subjects.	3.41	Agree
18	If I am presented with a new mathematical situation, I can cope with it because I have a good background in mathematics.	3.87	Agree
19	I get flustered if am presented with a problem different form the problems worked in class.	3.51	Agree
20	I do not feel that I can use the knowledge gained in the math courses I have taken so far.	3.06	Undecided
	Grand Mean	**3.46**	**Agree**

Note: 1.00-1.79– Strongly Disagree 1.80-2.59 – Disagree 2.60-3.39 - Undecided
3.40-4.19– Agree 4.20-5.00 - Strongly Agree

Value Practices of Badjao Students towards Mathematics

Table 4 provides the summary distribution of value practices of Badjao students towards Mathematics. In this regard, the result shows that on the average, students sometimes go to class on time in studying mathematics and listen to their mathematics teacher's discussion. Also, before they study, clean up their desks for study concentration with a weighted mean of 2.87, attend their mathematics class regularly with a weighted mean of 2.86 and study hard before taking any mathematics quizzes with a weighted mean of 2.85. The overall mean is 2.78, which implies that Badjao students are mediocre in doing the said value practices in learning mathematics. This is due to the family responsibilities that they can't focus on studying mathematics. Their parents assigned them to family task and obligation that is not related to their education.

Table 4. Value Practices of Badjao Students towards Mathematics

Item No.	Indicators on Value Practices towards Mathematics	Weighted Mean	Description	Rank
1	I cooperate in doing any mathematical activity in class	2.75	Sometimes	6
2	I close my mathematics notebook during examinations	2.72	Sometimes	8
3	I attend my mathematics class regularly	2.86	Sometimes	4
4	I study hard before taking any mathematics quizzes	2.85	Sometimes	5
5	I listen to my mathematics teacher attentively.	2.99	Sometimes	2
6	I will not give up easily in solving any difficult problems in mathematics.	2.39	Sometimes	10
7	I can make good use of time to study mathematics.	2.62	Sometimes	9
8	In studying mathematics, I go to class on time.	3.06	Sometimes	1
9	In studying mathematics, I intend to solve the problem. by myself and will not ask help from other people.	2.73	Sometimes	7
10	Before I study, I have a hobby to clean up the desk for study concentration	2.87	Sometimes	3
	Grand Mean	***2.78***	**Sometimes**	

Note: 1.00-1.79 - Never 1.80-2.59 - Seldom 2.60-3.39 - Sometimes
3.40-4.19 - Often 4.20-5.00 - Always

Level of Exposure of Badjao Students to Information Technology-Related Instructional Materials in Mathematics

Table 5 reveals that, on the average, Badjao students sometimes do a little work in mathematics activity that requires the use of technology as possible. They seldom use the information technology in mathematics class to help them better understand complex and abstract concept. This is due to lack of exposure on the technology. However, they think that using the calculator helped them better understand the material being covered and found that using a calculator helped them in taking a mathematics test in a convenient way. Result reveals that they never use a calculator in their mathematics class since they can't afford to buy. The grand mean is 2.12 with a description of low in their level of exposure to information technology-related instructional materials in learning mathematics. This result is not consistent to the study of Salam and colleagues (2018) that deals with integration of technology in public schools. According to Prestridge (2012) technology in class room setting support the development of particular mathematical concepts, applications and problem solving skills of students. Hence, students in the 21st century must be expose to the modernity in order to be competitive in the society.

Table 5. Distribution of Exposure of Badjao Students to Information Technology Related Instructional Materials

Item No.	Indicators on Level of Exposure of Badjao Students to Information Technology-Related Instructional Materials	Weighted Mean	Description	Rank
1	I use a calculator when doing my mathematics homework.	1.82	Seldom	9
2	I use a calculator in my math class	1.48	Never	10
3	I found that using a calculator helped me when taking a mathematics test	2.11	Seldom	4

4	I think that using the calculator helped me better understand the material being covered in mathematics class	2.17	Seldom	3
5	I found that almost all of the features of the calculator were very easy to use	1.90	Seldom	8
6	I do a little work in math activity that requires the use of Technology as possible	3.04	Sometimes	1
7	I don't have sufficient access to computer	2.07	Seldom	6
8	I don't have the necessary skills to use a computer or information technology in my class work	2.08	Seldom	5
9	The use of information technology in mathematics class has helped me to communicate and collaborate with my classmates	2.03	Seldom	7
10	The use of information technology in mathematics class helped me better understand complex and abstract concept	2.46	Seldom	2
	Grand Mean		**2.12**	
	Overall Description		**Seldom**	

Note: 1.00-1.79 - Never 1.80-2.59 - Seldom 2.60-3.39 - Sometimes
3.40-4.19 - Often 4.20-5.00 - Always

Level of Achievement of the Badjao Students in Mathematics

Table 6 presents the distribution of the level of achievement in mathematics among Badjao students. It can be gleaned that most of them fell under beginning level of proficiency with 91.5%. The respondents at this level struggles with his or her understanding; prerequisite and fundamental knowledge and/or skills have not been acquired or developed adequately to aid understanding. In developing level there were only two students which is equivalent to 2.8%. The students at this level possess the minimum knowledge and skills and core understandings and, with little guidance fromthe teacher and/or some assistance from peers, can transfer these understandings through authentic performance tasks. One student has reached in approaching proficiency whichis 1.4%. The student at this level has developed the fundamental knowledge and skillsand core understandings, and can transfer them automatically through authentic performance task. And also one has reached in proficiency level which is 1.4% and there were two students are advanced in their level of achievement in Mathematics with 2.8%. The students in the advanced level exceed the core requirements in terms of knowledge, skills and understandings, and can transfer them automatically and flexibly through authentic performance tasks. Table 5 shows that Badjao students are categorized asbeginners in the learning of mathematics. This infers that these students must be motivated to learn and improve their well-being as a student by proper teaching strategies in mathematics (Casinillo and Aure, 2018; Casinillo and Guarte, 2018).

Table 6. Level of Achievement in Mathematics among Badjao Students

Level of Achievement in Mathematics	**Frequency**	**Percent**
Beginner	65	91.5
Developing	2	2.8
Approaching proficiency	1	1.4
Proficient	1	1.4
Advanced	2	2.8
Total	**71**	**100.0**
Overall Average Percentage Score	**76.56**	
Overall description	**Beginner**	

Relationship between Mathematics Achievements of Badjao Students and its Cultural Factors

Table 6 shows that there is a highly significant relationship (p-value<0.001) between the belief in nature of mathematics and the level of achievement in Mathematics. Also, it also shows that their belief in their ability in mathematics is significantly related (p-value=0.051) to their level of achievement. This implies that the Badjao students beliefs in the nature of mathematics and their ability are great contributory factors to their achievement. These are important considerations for the mathematics teachers so they have relevant basis for mathematical interventions to improve the Badjao's acheivements. However, their belief in the importance of mathematics does not influence their level of achievement. Based on the coefficient of determination, only 5.62% of the differences in students' level of achievement in mathematics can be attributed to their belief in the importance of mathematics. On the average, it reveals that the over-all belief influences the level of achievement of Badjao students (Table 6). Based on the study of Sangcap (2010), it is stated that student's epistemological beliefs about math were concepts in the personal epistemology area, which refers to his/her naive views or opinions about the nature and acquisition of mathematics knowledge. It cited also by Chunmei et al. (2009) that it was like an invisible hand, deeply hiding behind an individual's behavioral expression, cognitive process and emotional experience, but deeply affecting the learning process. Moreover, there is a significant relationship (-value=0.048) between the value practices and the achievement of mathematics (Table 6). This implies that the learning behavior of students really influences their level of achievement. This result is supported on the study of Kunal (2008) that value practices is the most important element of raising mathematics learning and teaching qualities. Further, there is no sinificant relationship between the level of exposure on information technology- related instructional materials and level of achievement in mathematics (Table 6). Only 10.56% of the differences in students' level of achievement in mathematics can be attributed to their exposure on the technology-related instructional materials.

Table 6. Relationship between Badjao Students' Achievement in Mathematics and Cultural Factors using Chi-square Contingency Coefficient

	Correlation Coefficient	**Coefficient of Determination (%)**	**p-value**	**Strength of Relationship**
Belief in Nature of Mathematics	0.713***	50.84	<0.001	High
Belief of the importance of Mathematics	0.237^{ns}	5.62	0.979	Weak
Badjao students' ability in Mathematics	0.477*	22.75	0.051	Moderate
Over-all Beliefs	0.591***	34.93	<0.001	High
Value Practices	0.521**	27.14	0.048	Moderate
Exposure on Information Technology	0.325^{ns}	10.56	0.753	Weak

Note: ns- not significant; * - significant at 10% level; **- significant at 5% level; ***- significant at 1% level

Conclusion

The aimed of this study is to evaluate the level of achievement in mathematics among Badjao students in regards to cultural factors such as belief, value practices and exposure to technology-related instructional materials. Result shows that students strongly agree about the beliefs on the nature of Mathematics, belief on the importance onMathematics and the belief on students' ability in Mathematics. It is concluded that they have a positive perception and believe that mathematics is useful in different areas intheir lives. Also, Badjao students have observed a good value practices while they attend

their mathematics class and while they were doing mathematics activities in school. These beliefs exert a powerful influence on students' evaluation of their own ability, on their willingness to engage in mathematical task, and on their ultimate mathematical disposition. It is also shown that the level of achievement in mathematics is positively correlated by the beliefs and value practices. Further, there is no significant relationship between the level of exposure of Badjao students to information technology relatedmaterials in mathematics and mathematics achievement. Badjao students seldom workon the task that requires the use of information technology-related instructional materials. This implies that they have a less exposure to this type of instructional materials. Thus, majority of these students were in the beginning level of proficiency in mathematics. Thisinfers that Badjao students are struggling to understand and comprehend the fundamental knowledge and skills in mathematics presented during discussion.

Hence, it is recommended that Badjao students should be exposed to information technology-related instructional materials like the computer and calculator technology to somehow give them other intervention that helps improve their level of achievement in mathematics in regards to their beliefs in and value practices. Furthermore, it is strongly recommended that similar study should be conducted in any public schools with larger sample size of Badjao students to better understand the students' level of achievement in mathematics and its influencing cultural factors. Also, a periodic evaluation of the level of achievement can help the teachers and students improve the teaching-learning process in mathematics in elementary and secondary level of education in the country. Policy makers in the Department of Education (DepEd) in the Philippines must provide aprogram that support the students with parents who are earning below minimum wage. For future research, an empirical analysis on socio-economic aspect of Badjao students in the Philippines should be conducted to understand the well-being and economic status. This is to improve the existing policy in public schools in the Philippines where Badjao students are present.

References

Alabekee, E. C., Samuel, A. and Osaat, S. D. (2015). Effect of cooperative learning strategy on students learning experience and achievements in mathematics. *International Journal of Education Learning and Development, 3*(4), 67-75.

Bottignolo, B. (1995). *Celebrations with the Sun: An overview of religious phenomena among the Badjaos*. Ateneo de Manila Press. Philippines.

Casinillo, L. F., & Aure, M. R. K. L. (2018). Econometric evidence on academic performance in basic calculus of Science, Technology, Engineering and Mathematics (STEM) Senior High Students. *Journal of Educational and Human Resource Development, 6*, 238-249.

Casinillo, L. F. & Guarte, J. M. (2018). Evaluating the effectiveness of teaching strategies: the case of a national vocational school in Hilongos, Leyte. *Review of Socio-Economic Research and Development Studies, 2*(1), 64-79.

Chunmei, X., Ping, Y. & Lizhou, Y. (2009). Influences on affect and achievement: High school students' epistemological beliefs about mathematics. *Journal of Mathematics Education. 2*(2), 1-11.

Chamberlin, M. (2009) Teachers' reflections on their Mathematical learning experiences in a professional development course. *Mathematics Teacher Education and Development, 11, 22-35.*

Clarke, G. (2001). From ethnocide to ethno-development? Ethnic minorities and indigenous peoples in Southeast Asia', *Third World Quarterly, 22*(3), 413-436.

Gbore, L. C. (2006). Measuring between free time availability and student performance perceptions. *Marketing Education Review, 12*, 21-32.

House, J. D. (2006). Mathematics beliefs and achievement of elementary school students in Japan and the United States: Results from the third international mathematics and science study. *The Journal of Genetic Psychology*, *167*(1), 31–45.

Kunal, D. S. (2008). Cultivating competence, self-efficacy and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 4*(3), 586-598.

Liu, E. Z. F., Lin, C. H., & Chang, C. S. (2010). Student satisfaction and self-efficacy in a cooperative robotics course. *Social Behavior and Personality, 38*(8), 1135-1146.

Mashile, E. O. (2001). Science achievement determinants: factorial structure of family variables. *South African Journal of Education, 21*, 335-338.

Meggiolaro, S. (2018). Information and communication technologies use, gender and mathematics achievement: evidence from Italy. *Social Psychology of Education, 21*(2), 497-516. Doi: https://doi.org/10.1007/s11218-017-9425-7

Nathan, R. Kuncel. (2008). Intemporal consistency of predictors of student performance: Evidence from a business administration programme. *Journal of Education for Business, 82*, 88-93.

Prestridge S. (2012). The beliefs behind the teacher that influences their ICT practices. *Computers & Education, 58*(1), 449 458. Retrieved from https://doi.org/10.1016/j.compedu.2011.08.028

Salam, S., Zeng, J. Q., Pathan, Z. H., Latif, Z., & Shaheen, A. (2018). Impediments to the Integration of ICT in Public Schools of Contemporary Societies: A Review of Literature. *Journal of Information Processing Systems, 14*(1), 252-269. Retrieved from https://doi.org/10.3745/JIPS.04.0062

Sangcap, P. G. A. (2010). Mathematics-related beliefs of Filipino college students: Factors affecting mathematics and problem solving performance. *Procedia – Social and Behavioral Science, 8*(1), 465-475. doi:10.1016/j.sbspro.2010.12.064

Schiffrin, H. H., & Nelson, S. K. (2010). Stressed and happy? Investigating the relationship between happiness and perceived stress. *Journal of Happiness Studies, 11*(1), 33-39. Retrieved from http://dx.doi.org/10.1007/s10902-008-9104 -7

Schuman, E. J. (2000). Impact of personality on academic performance of MBA students: Qualitative versus quantitative courses. *Journal of Innovation Education, 4*, 175-190.

Smith, M. & Good, R. (1984). Problem solving and classical genetics, successful versus unsuccessful performance. *Journal of Research in Science Teaching, 21*, 895-912

Titu, A., Gallian, J., Kane, J. & Mertz, J. (2008). Cross-cultural analysis of students with exceptional talent in mathematical problem solving. *Notices of the American Mathematical Society, 55*(10), 1248-1260.

Uslu, O. (2018). Factors associated with technology integration to improve instructional abilities: A path model. *Australian Journal of Teacher Education, 43* (4), 31-50. Retrieved from https://doi.org/10.14221/ajte.2018v43n4.3