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Analysis of Business Students' Difficulties in Transferring Business Mathematics Knowledge to Business studies: The Case of BGC Trust University Bangladesh

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Abstract

This study investigated business students' (BS) difficulties in transfer of learning from business mathematics (BM) courses to business studies. To do this, the authors have collected the data from 182 undergraduate students of BGC Trust University Bangladesh (BGCTUB) by using simple random sampling technique. The data are processed through SPSS (23 version) and the MS excel. Factor analysis (Principal Component Analysis) is conducted to analysis the data. There are 17 closed ended questions (difficulties) asked from the students. This analysis reduced these 17 difficulties into 6. Among the 6 difficulties, first one is most important which explains highest variance (24.862%) in the variables and initial Eigen value is 4.227. It covers most of the difficulties (10) from the 17 difficulties. And second one is also important which explains 8.706% of the variation in students' problem for their understanding and it covers 3 difficulties. Hence, BM instructors are suggested to concentrate the first and second important difficulties to transfer business mathematic knowledge to business studies. This study also analyzes the socio-demographic background of the students studying at BGCTUB. Limitation and further directions for research is also given.

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1. Introduction

In this real-world mathematics is a technical toolbox that used frequently in every direction of sciences as well as business studies. There are many mathematicians and economists emphasizing the deep interrelation between mathematics and business studies/economics. Mathematics has been considered one of the fundamental courses for sciences as well as business studies. Feynman (1992) for example states that "…it is impossible to explain honestly the beauties of the laws of nature in a way that people can feel, without their having some deep understanding of mathematics." Since the ancient times, mathematics played a very important role in the study of nature. Now a day, mathematics is used in business and economics to solve different kinds of problem and it is imperative for students to have a solid knowledge in business studies. The mathematics curriculum, according to Ngussa and Mbuti (2017), is designed to give pupils the information and abilities need to succeed in the rapidly changing technological environment. Students with mathematic difficulty also struggle to understand the symbols of mathematics, including how to interpret symbols within equations (Powell et al. 2016.Good teaching and enjoyable courses are key contributors to students' pleasure of mathematics, claim Yilmaz et al. (2010). Mathematically challenged students require intensive and specific intervention (Gersten 2016; Mononen et al. 2014). Without this assistance, math achievement gaps between grades either remain the same or widen (Koponen et al. 2018; Stevens et al. 2015). As a consequence of interventions that concentrated on early numeracy (Clarke et al. 2019),whole numbers (Zhang et al. 2014), and word-problem solving (Swanson et al. 2013), students with math challenges have improved in arithmetic throughout all elementary grades.Therefore to understand how business students apply what they have earned in a BM course to business study and it is essential to investigate their transfer of learning. The transfer of learning has been referred to as the ultimate goal of education and it is defined as the ability to apply what has been learned in one situation to a new situation. We observe that students were unable to apply a principle or schema extracted from particular context to a new context. In this study, we also observe throughout our experience of teaching that situation. Some BM courses teachers also claiming that their students lack the pre-requisite BM knowledge that could help them in solving problems. Most of the Business students perform poorly in introductory BM courses. In this investigation we attempted to explore the problem in BGC Trust University Bangladesh, in the under graduate business students. Therefore, investigating transfer of learning from BM course to business study is the central focus of this study.

2. Problem statements

The business students speak to the BM instructor as though they never seen fundamental of mathematics in secondary level. So, most of the business students in this university have seen refusing or dislike studying BM as their business course. They even do not like this course; however, they obliged to study this course by their last interest or choice. In this case most of the instructors had seen complaining by assuming that they did not have mathematics subject in preparatory level. Although they need to use BM knowledge to solve and understand different kinds problem in business courses especially in economics and finance. In our teaching experience we saw the weakness of BS and they are afraid of mathematics also. Therefore, we believed that students have difficulties in transferring the knowledge they had achieved from BM courses to the introductory of business study.To investigate the transfer of knowledge from business mathematics to business studies, the following research questions are raised and answered by this research.

1. To what extent do students retain and transfer their business mathematics knowledge when solving problems in the introductory business courses?
2. What are the main difficulties of students not to capture the knowledge and

transfer what they have learned in business mathematics to introductorybusiness studies?

3. What strategies may facilitate students' transfer of knowledge from business mathematics tobusiness studies?

3. Objective of the study

The main aim of this study is to explore and suggest ways of solving the difficulties of the BGC Trust University business students transferring ability of business mathematics (BM) knowledge to business studies. The specific objectives is to investigate to what extent students retain and transfer the BM knowledge in tobusiness studies, to sort out the main difficulties of students to transfer knowledge of BM tobusiness studies and to indicate the strategies that help instructors how to teach BM andB

4. Significance of the study

Both instructors and students were benefited from the result of this study. Since most instructors have applied science backgrounds, pinpointing the difficulties and the strategies of transferring knowledge of business mathematics in to business studies will have an immense use to teach mathematics and introductory business studies. In addition, it will serve as springboard to young researchers who are interested in this field of study for furtherinvestigation.

5. Literature Review:

Many business students had trouble with mathematic, especially when it came to using it to solve problems (Ibrahim 1997; Garderen 2006; Zahrah et al., 2003; Tarzimah 2005). Nonetheless, due to its relevance to daily life, they must continue learning mathematics (Ibrahim 1998; Meese 2001; Aziz 2002; Kaufman 2008; Berch and Mazzocca 2007). Because issue solving is crucial for the growth of human capabilities, they must be able to solve corporate problems (T. Subahan, 2007). Students must solve issues in order to function in daily life, and mathematics is considered as the language for doing so.Knowing math can be compared to having a favorable or unfavorable attitude toward math (Mc Leod, 1992; Haladyna et., 1983). Significant disparities were discovered in a number of categories, and knowledge variables were discovered to be helpful in predicting grades (Odell and Schumacher, 1998). According to the previous study, a variety of elements, including the teaching and learning process, the school environment (Creemers and Reezigt, 2005; Opdenakker and Van Damme, 2005; Van de Grift and Houtveen, 2006; and Wilms, 1992) all have an impact on students' mathematical achievement. Papanastasiou (2008) asserts that teaching methods have a direct impact on students' mathematical accomplishments as well as their understanding of mathematics, attitudes toward mathematics, classroom environments, perceptions of themselves as mathematicians, and other factors. In other words, if it is presented appropriately, the learning environment for the students can be improved. Also, kids who gain more from excellent education are self-regulatory, have good foundations in mathematics, and experience little frustration (Jones & Byrnes, 2006).Numerous elements have a role in why certain students difficulties in math (Davut Köce et al., 2009). Mathematics self-concept is one of the elements that affect students' progress in mathematics, and this aspect is related to their willingness to learn mathematics, according to Githua and Mwangi (2003). According to Walter and Hart (2009), students' social and personal motivations as well as their intellectual-mathematical motivations have an impact on how well they learn mathematics. In addition to these, studies of populations from elementary to high schools revealed that mathematics knowledge is a significant factor in mathematics education (Birgin et. al., 2010). In their 2003 study, Patterson et al. examined the statistical significance of the effects of gender, study time,

and how students perceive their parents' opinions on their ability to learn mathematics. Using semi-structured interviews, Yilmaz et al., (2010) discovered that the use of various teaching materials, teachers' classroom management abilities, their subject-matter expertise and personalities, the teaching of topics with real-life enriched examples, and students' opinions about mathematics courses are some additional factors affecting students' mathematical knowledge.Knowledge of business mathematics is influenced by one's disposition and level of attachment (Meyer and Koehler, 1990). The most crucial factor in raising a student's interest in business mathematics is knowledge. Given the literature mentioned above, it is crucial for business mathematics instructors to create an environment in the classroom where students have a positive outlook (Steinback and Gwizdala, 1995; Ayub et al., 2005).According to (Zahrah et al., 2003), students found mathematics to be challenging because they had trouble comprehending and remembering concepts, formulae, facts, and procedures. They also struggled to envision issues and concepts in mathematics (Tarzimah, 2005). Inadequate conceptual comprehension, illogical reasoning, and a lack of strategic knowledge led to mistakes in problem-solving (Tay Lay Heong 2005). Such errors indicated issues when they occurred (Nik Azis 2008). Aside from that, error analysis revealed that students' poor conceptual understanding was the cause of their lack of arithmetic and process expertise (Latha 2007). According to Mohd Johan (2002), many students struggled to give the problems meaning and lacked the knowledge necessary to develop and implement effective problem-solving techniques. According to, Cobb and Jackson, (2011); Cobb et al., (2018); Munter and Wilhelm, (2021) mathematics education have involved the reorganization and development of syllabi, curriculum materials, and classroom practices.Scholars suggested that improvement of mathematic knowledge is closely related to the views of teachers regarding the mathematical competence of students (Jackson et al., 2017; Jackson et al., 2018) in addition the provision of learning opportunities for students (Jackson, 2011; Russo et al., 2020). For example, Horn (2007) found that this view affected teacher's classroom actions, whereas Boaler (2015) and Sun (2019) classified teachers as having either a fixed or growth mindset. Students' mathematical capabilities are related to an aspect of mathematical knowledge sharing, that is, the view that students are capable of participating in rigorous mathematical activities such as collaborative learning centered around cognitively demanding mathematical tasks (Franke et al., 2007; Lahann and Lambdin, 2020).Kaufmann and Ryve, (2022) studied on mathematics difficulty and found students should collaborate with their teachers to overcome difficulteis in math. Boaler, J. (2015). Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching. John Wiley & Sons. Yet, few researches have focused on the challenges of solving mathematical problems due to a lack of arithmetic skills. Better programs to address the issues could be designed if the math skills required are understood. Also, if the teaching methods and learning approaches used did not meet the intellectual needs of the pupils, this could cause the students to have difficulty learning mathematics. To apply an effective teaching method and produce meaningful learning among students, teachers must comprehend students' potential, issues, and learning challenges (Meese, 2001)

6. Research Design

6.1. Questionnaire development and Scaling

Both closed-ended and open-ended questions have been used. To take advantage of data processing, the closed-ended questions are coded, whilst the open-ended questions are post-coded. This suggests that we first collected information from the respondents, which was afterwards categorized into several categories. The questionnaire was created using a five-point Likert scale that was created by Likert (1967). The numbers "4" and "5" on the scale signify levels of satisfaction; the higher the score, the higher the level of satisfaction. Similarly,

recording '1' and '2' signify satisfaction level, the lower the score, and the lower level of satisfaction. The remaining "3" denotes variables that are still up for debate.

6.2. Population and Sample Size

A sample of 182 (details is shown in the following table 01) respondents from a population of 1532 undergraduate students of the year 2019 at BGC Trust University Bangladesh was selected to participate in the study. The respondents were to indicate the factors they took into consideration or that influenced their decisions to choose BGC Trust University Bangladesh as a university to study at. As a method of selecting respondents, simple random sampling strategy which has equal chance of being selected, was used (Creswell, 2015).

Table 01: Details in Population and Sample Size

Semesters in BBA Departments	Population	No. of respondents	Percentages
8th Semester	232	48	31.85%
7th Semester	148	16	7.45%
6th Semester	246	24	11.31%
5th Semester	190	22	9.85%
4th Semester	171	13	6.54%
3rd Semester	254	26	12.34%
2nd Semester	261	33	21.06%
Total	1532	182	100%

Source: Admission office of the University

6.3. Data Processing and Analyzing Technique

The data was processed and analyzed using Microsoft Excel 2010 and IBM SPSS 23.0 versions. Using Microsoft Excel, the socioeconomic standing of students enrolled in private universities was calculated. As methods for analyzing data, Principal Component Analysis (PCA) has been used to examine the responses.

6.3.1. Principal Component Analysis (PCA)

The use of factor analysis results in the identification of a small group of uncorrelated factors. The selection of highly linked variables may have presented challenges for the later analysis. In a subsequent multivariate analysis, specifically a principal component analysis, the outcome of this factor analysis is utilized. Our two hypotheses are as follows:

Ho: Variables are uncorrelated

H1: The variables are highly correlated.

6.4. Reliability and Validity test:

Table 2: Measurement of Reliability

Variables	Statistics
Number of Items	17
Cronbach's Alpha	0.791
N	181

Source: SPSS output

The study adopts a more scientific measure of data and measurement reliability and validity test. Cronbach's Alpha is applied to measure the internal consistency and reliability, that is, do all the items in the scale really tap into one construct. The results in table 2 show the Cronbach's Alpha reliability test statistics based on 17 items of 0.791. In the social science research, it is necessary to mention that the alpha value of Cronbach is ranged from 00 to 01, but to make the scale reliable the agreeable level must be more than 0.60 (Malhotra, 2002) (Cronbach, 1951). Thus, an Alpha of 0.791 is preferred and considered a good reliability of the questionnaire measurement.The validity denotes the amount of differences in the scores of scale and explain whether right variation among the information of measured characteristics are reflected or not

instead of occurring random or systematic error (Malhotra, 2002). Criterion validity will be considered in this research. This validity will indicate that various criteria of variables such as demographic features, behavioral aspect and attitudinal measures will be gathered simultaneously.

7. Empirical Results and Analysis

In total, 17 variables are employed in this study's Principle Component Analysis. The idea that the variables are uncorrelated in the population has been investigated using Bartlett's test of sphericity.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.761
Bartlett's Test of Sphericity	Approx. Chi-Square	631.861
	df	136
	Sig.	.000

Source: Author's own calculation

Factor analysis is appropriate since above table 3's KMO (Kaiser-Meyer-Olkin) value is 0.761, which is between 0.5 and 1.0. (Hadi and Islam, 2015). The Chi square test, on the other hand, is 631.861 with 136 degrees of freedom and significant at 0.000 (1% level). As a result, factor analysis reveals the most important variables that influence students' difficulties to understand the business mathematical problems.

Table 4: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Deficulties-01	4.227	24.862	24.862	4.227	24.862	24.862
Difficulties -02	1.480	8.706	33.569	1.480	8.706	33.569
Difficulties -03	1.353	7.960	41.529	1.353	7.960	41.529
Difficulties -04	1.180	6.941	48.469	1.180	6.941	48.469
Difficulties -05	1.098	6.460	54.929	1.098	6.460	54.929
Difficulties -06	1.054	6.199	61.128	1.054	6.199	61.128
Difficulties -07	.869	5.110	66.239			
Difficulties -08	.842	4.953	71.192			
Difficulties -09	.789	4.643	75.834			
Difficulties -10	.693	4.078	79.912			
Difficulties -11	.650	3.824	83.736			
Difficulties -12	.606	3.567	87.303			
Difficulties -13	.563	3.312	90.615			
Difficulties-14	.484	2.847	93.462			
Difficulties-15	.402	2.365	95.827			
Difficulties-16	.365	2.149	97.976			
Difficulties-17	.344	2.024	100.000			

Extraction Method: Principal Component Analysis.

The above table 4, a principal component factor analysis was conducted on the 17 variables related to the difficulties of the students to understand the mathematical problems. This analysis yielded a 6-factor solution that explained 61.182% of the variance that are represented.

Table 5: Component Matrix[a]

	Component					
	1	2	3	4	5	6
Difficulties-01	.377	-.396	**.540**	-.261	.081	.210
Difficulties-02	**.504**	-.146	.264	.399	-.297	.102
Difficulties-03	**.687**	-.028	.196	-.090	-.278	-.112
Difficulties-04	.305	.039	-.555	-.226	.058	**.612**
Difficulties-05	**.641**	.220	-.257	-.084	.084	.063
Difficulties-06	**.506**	-.003	-.287	.127	-.210	-.343
Difficulties-07	**.596**	-.191	.042	-.072	.241	-.243
Difficulties-08	**.555**	.013	-.386	.267	.258	.141
Difficulties-09	**.599**	.009	-.026	-.084	-.127	-.113
Difficulties-10	.462	-.095	.145	-.460	**.484**	-.091
Difficulties-11	**.657**	-.273	.136	.040	.032	.208
Difficulties-12	**.592**	-.244	.037	.213	-.119	.148
Difficulties-13	.360	.028	-.087	**.575**	.388	-.219
Difficulties-14	.158	**.624**	.369	.078	.362	-.105
Difficulties-15	.472	**.544**	-.044	-.300	-.086	-.080
Difficulties-16	**.437**	.290	-.046	-.195	-.433	-.182
Difficulties-17	.121	**.549**	.396	.251	-.063	.476

Extraction Method: Principal Component Analysis.

In the table 5, students' difficulties are shown according to their Eigen value(more than 1.00

Table 6: Uncorrelated Factors

No	Factor Name	Loaded factors	Initial Eigen Values	% of Variance	Cumulative (%)
1	First important difficulty	level of knowledge about the consequences of different ways to ask questions to subsequent mathematical analysis, BM courses improve analytical ability, mathematical courses materials connecting to study, ability to solve any mathematical problem in related business studies of courses, ability to plan own work, what formula is appropriate for different situations in solving business problem, BM syllabus is well developed for solving business problems, mathematical knowledge that help to improve the performance in business studies courses, apply effectively mathematical knowledge to business studies courses, BM Knowledge will be effective or helpful for higher studies and research in future.	4.227	24.862	24.862
2	Second important difficulty	BM courses have relationship with finance or economics in the study of business, BM knowledge is effective to take preparation and helpful for upcoming carrier building in any financial or business institution, teaching method should be improved for studying BM.	1.480	8.706	33.569
3	Third important difficulty	level of understanding of basic mathematical concepts	1.353	7.960	41.529
4	Fourth important difficulty	decide how to perform ability by applying this knowledge to business studies courses	1.180	6.941	48.469
5	Fifth important difficulty	Covers outline the material to help in organizing BM course.	1.098	6.460	54.429
6	Sixth important difficulty	Devote a lot of time to study the this types of mathematical courses	1.054	6.199	61.128

Our study showed that 'First important difficulty' is the most important factors explaining the highest variance (24.862%) in the variables. The 10 variables contained in this key factor are: level of knowledge about the consequences of different ways to ask questions to subsequent mathematical analysis, BM courses improve analytical ability, mathematical courses materials

connecting to study, ability to solve any mathematical problem in related business studies of courses, ability to plan own work, what formula is appropriate for different situations in solving business problem, BM syllabus is well developed for solving business problems, mathematical knowledge that help to improve the performance in business studies courses, apply effectively mathematical knowledge to business studies courses, BM Knowledge will be effective or helpful for higher studies and research in future.The second important difficulty explains 8.706% of the variation in students' problem for their understanding. This factor includes BM courses have relationship with finance or economics in the study of business, BM knowledge is effective to take preparation and helpful for upcoming carrier building in any financial or business institution, teaching method should be improved for studying BM.The third important difficulty explains 7.960% of variance. These factors included in this component are level of understanding of basic mathematical concepts. The fourth important difficulty accounts for 6.941% of the variance and covers decide how to perform ability by applying this knowledge to business studies courses.The fifth important difficulty accounts for 6.460% of the variance and covers outline the material to help in organizing BM course.The sixth important difficulty accounts for 6.199% of the variance and covers Devote a lot of time to study this type of mathematical courses.

9. Socio-demographic Background of the Students

We used primary data from 182 BGC Trust University students in our study. In order to determine their socioeconomic situation, we questioned them about their gender, education, age, place of residence and their running semester. The information from the questionnaire is shown in the tables below.

Table-07: Gender of BGC Trust University students

Gender	No. of Students	Percentages
Male	130	71%
Female	52	29%
Total	182	100%

Source: Questionnaire

Table-8: Age of BGC Trust University students

Age	No. of Students	Percentages
18 to 20 years	59	32%
20 to < 22 years	35	19%
22 to < 24 years	48	26%
24 years & above	40	23%
Total	182	100%

Source: Questionnaire

Table-9: Place of Residence of BGC Trust University students

Place of Residence	No. of students	Percentages
Rural Area	104	57%
Urban Area	78	43%
Total	182	100%

Source: Questionnaire

According to the information provided above, we found 71% male and 29% female students. Maximum students' age range in between 18 to 24 where 40 students found 24 plus. The majority of the pupils in our study are from rural areas, whereas 78 pupils reside in urban area. So, all types of students have faced the mathematical difficulties to transfer their knowledge into business studies.

10. Conclusion

The study discovers that there are seventeen students 'difficulties to understanding business problems in BGC Trust University Bangladesh. In this study, the authors have identified six uncorrelated factors of difficulty such as difficulty -01, difficulty -02, difficulty -03, difficulty -

04, difficulty -05, and difficulty -06. Among the six difficulty factors, diffulty-01 is the most important factor which includes level of knowledge about the consequences of different ways to ask questions to subsequent mathematical analysis, BM courses improve analytical ability, mathematical courses materials connecting to study, ability to solve any mathematical problem in related business studies of courses, ability to plan own work, what formula is appropriate for different situations in solving business problem, BM syllabus is well developed for solving business problems, mathematical knowledge that help to improve the performance in business studies courses, apply effectively mathematical knowledge to business studies courses, BM Knowledge will be effective or helpful for higher studies and research in future. This difficulty explains 24.86% of the variation in students' problem for their understanding and second one is also important which explains 8.71% of the variation in students' problem for their understanding and it covers 3 difficulties. The difficulties of BM were not clear in previous study like my proposed study. Hence, BM instructors and concern authority are suggested to concentrate the first and second important difficulties to transfer business mathematic knowledge to business studies of BGC Trust University Bangladesh.

11. Application, Limitations and Future work

Businesses will use the proposed study to keep track of and organize their operations. The fields of accounting, inventory management, marketing, sales forecasting, and financial analysis all rely heavily on mathematics in commercial enterprises.Its primary goal is to help students apply their math knowledge and skills in novel situations. Discrete growth and decay, financial models, matrices, network analysis, route planning, project management, and decision making are just a few examples.The study's biggest flaw is the study's limited sample size (182). If the sample size had been larger, the research would have been more trustworthy. Just BGC Trust University Bangladesh was the subject of this study; other private and state universities were not taken into account. It might be proposed that further research may be undertaken to analyze the students' difficulties to understand the mathematical problems of other private and public universities in Bangladesh.

References

Ayub, Lian, and Mukti. (2005). Students Attitudes Toward Calculus: A Preliminary Study Among Diploma Students AtUniversiti Putra Malaysia. *JurnalTeknologi* (E),42 (E). pp. 49-60. ISSN 0127-9696.

Aziz Omar (2002). KomunikasidalamMatematik. *Jurnal Akademik MaktabPerguruan Terengganu JLD XIII*: 41– 57.

Berch, D.B. & Mazzocco M.M.M. (2007). Why is math so hard for some children? *The Nature and Origins of Mathematical Learning Difficulties and Disabilities.* Maryland: Paul H. Brookes Publishing Co.

Birgin, O., Baloglu, M., Cathlioglu, H. &Gurbuz, R. (2010). An investigation of mathematics anxiety among sixth through eighth grade students in Turkey. Learning and Individual Differences.

Clarke, B., Doabler, C. T., Smolkowski, K., Turtura, J., Kosty, D., Kurtz-Nelson, E., Fien, H., & Baker, S. K. (2019). Exploring the relationship between initial mathematics skill and a kindergarten mathematics intervention. *Exceptional Children*, *85*, 129–146.

Cobb, P., and Jackson, K. (2011). Towards an empirically grounded theory of action for improving the quality of math ematics teaching at scale. *Mathematics Teacher Education and Development,* 13(1), 6–33.

Cobb, P., Jackson, K., Henrick, E., & Smith, T. M. (2018). *Systems for instructional improvement: Creating coherence from the classroom to the district office.* Harvard Education Press.

Creswell, J. W. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research, 5th ed.* Boston, MA: Pearson.

Cronbach, L. (1951). *Coefficient alpha and the internal structure of tests*. Psychometrika, *6*(3):297-334.

Feynman, R. (1992). *The character of physical law.* London: Penguin Press Science

Franke, M. L., Kazemi, E., & Battey, D. (2007). *Mathematics teaching and classroom practice.* In F. K. Lester (Ed.), Second handbook of research on mathematics teaching and learning (2nd ed., pp. 225–256). Information Age Publishing.

Garderen, D.V. (2006). Spatial Visualization, Visual Imaginary and Mathematical Problem Solving of Students with Varying Abilities. *Journal of Learning Disabilities* 39(6): 496–506.

Gersten, R. (2016). What we are learning about mathematics interventions and conducting research on mathematics interventions. *Journal of Research on Educational Effectiveness*, *9*, 684–688.

Githua, B. N. & Mwangi, J. G. (2003). Students' mathematics self-concept and motivation to learn mathematics: relationship and gender differences among Kenya's secondary-school students in Nairobi and Rift Valley provinces. *International Journal of EducationalDevelopment* 2,3 487–499.

Hadi, R. S. and Islam, M. M. (2015). Exploring Entrepreneurial Potentials: The Performance of EMK Center" *BGC Trust University Journal,* 2:155

Haladyna, T., Shaughnessy, J. & Shaughnessy, M. (1983). A Causal Analysis of Attitude Toward Mathematics. *Journal for Research in Mathematics Education,* 14 (1)*,* 19-29.

Horn, I. S. (2007). Fast kids, slow kids, lazy kids: Framing the mismatch problem in mathematics teachers' conversa tions. *The Journal of the Learning Sciences,* 16(1), 37–79. https://doi.org/10.1080/10508400709336942

Ibrahim Ismail (1997). Di Mana SusahnyaMatematik? *JurnalPengurusan Pendidikan* 7: 17-21.

Ibrahim Ismail (1998). Matematik dan Masyarakat. *Jurnal Akademik MaktabPerguruan Kota Bahru*Jld 6: 30– 35.

Jackson, K. (2011). Approaching participation in school-based mathematics as a cross-setting phenomenon. *Journal of the learning sciences,* 20(1), 111–150. https://doi.org/10.1080/10508406.2011.528319

Jackson, K., Gibbons, L., and Sharpe, C. J. (2017). Teachers' Views of Students' Mathematical Capabilities: Challenges and Possibilities for Ambitious Reform. *Teachers college record*, 119(7), 1–43. doi:10.1177/ 016146811711900708

Jackson, K., Wilhelm, A. G., and Munter, C. (2018). *Specifying goals for students' mathematics learning and the devel opment of teachers knowledge, perspectives, and practice.* In P. Cobb, K. Jackson, E. Henrick, and T. M. Smith (Eds.), Systems for instructional improvement: Creating coherence from the classroom to the district office (pp. 43–64). Harvard Education Press.

Jones, K. K. & Byrnes, J. P. (2006) Characteristics of students who benefit from high-quality mathematics instruction. *Contemporary Educational Psychology* 31 (3), 328-343.

Kaufmann, O.T & Ryve, A. (2022): Teachers' framing of students' difficulties in mathematics learning in collegial discussions, *Scandinavian Journal of Educational Research,* DOI: 10.1080/00313831.2022.2115134

Kaufmann, O.T & Ryve, A. (2022): Teachers' framing of students' difficulties in mathematics learning in collegial discussions, *Scandinavian Journal of Educational Research,* DOI: 10.1080/00313831.2022.2115134

Kaufman, L. (2008). Dyscalculia: Neuroscience and Education. *Journal Education Research,* 50(2): 163– 175.

Koponen, T., Aro, M., Poikkeus, A.-M., Niemi, P., Lerkkanen, M.-K., Ahonen, T., & Nurmi, J.- E. (2018). Comorbid fluency difficulties in reading and math: Longitudinal stability across early grades. *Exceptional Children, 84*, 298–311.

Köğce, D. et al. (2009). Examining elementary school students' attitudes towards mathematics in terms of some variables. *Procedia School and Bahvioral Sciences* 1, 291-295.

Lahann, P., & Lambdin, D. V. (2020). Collaborative Learning in Mathematics Education. In S. Lerman (Ed.), *Encyclopedia of Mathematics Education*, 75–76. Springer.

Latha Maheswari Narayanan (2007). Analysis of Error in Addition and Subtraction of Fraction among Form 2. *KertasProjek Sarjana Pendidikan*. Universiti Malaya.

Likert, R. (1967). The method for constructing an attitude scale, In M. fishbein (Ed*),Readings in attitude theory and measurement*. New York: Wiley, 90-95.

Malhotra, N. K. (2002). *Marketing Research: an applied orientation*(3rd ed.), prentice hallinternational, Inc. Upper Saddle River, New Jersey

McLeod, D. (1992). Research on Affect in Mathematics Education: A Reconceptualization. In D. Grows (Ed), *Handbook of Research on Mathematics Teaching and Learning* (575-596).

Meese, R. L. (2001). *Teaching Learners with Mild Disabilities Integrating Research and Practice.* Ed. ke-2. Singapore: Wadworth Thomson Learning.

Meyer, M. R., & Koehler, M. S. (1990). Internal influences on gender differences in mathematics. *In F. &. Leder, Mathematics and Gender* (pp. 60-95). New York: Teachers College Press.

Mohd Johan bin Zakaria. (2002). PerkaitanantaraPendekatanBelajar dan Kemahiran MenyelesaikanMasalahdenganKeupayaanMenyelesaikanMasalahbagiTajukPecahan. TesisDoktorFalsafah Pendidikan. UniversitiKebangsaan Malaysia.

Mononen, R., Aunio, P., Koponen, T., & Aro, M. (2014). A review of early numeracy interventions for children at risk in mathematics. *International Journal of Early Childhood Special Education*, *6*, 25–54.

Munter, C., & Wilhelm, A. G. (2021). Mathematics teachers' knowledge, networks, practice, and change in instruc tional visions. *Journal of Teacher Education,* 72(3), 342–354.

Nik Azis Nik Pa (2008). Isu-isukritikaldalam Pendidikan Matematik. Kuala Lumpur: PenerbitUniversiti Malaya.

Ngussa, B. M., & Mbuti, E. E. (2017). The Influence of Humour on Learners' Attitude and Mathematics Achievement: A Case of Secondary Schools in Arusha City, Tanzania. *Journal of Educational Research*, *2*(3), 170 -181. Retrieved from https://www.researchgate.net/publication/315776039

Odell, P. M. & Schumacher, P. (1998). Attitudes Toward Mathematics and Predictors of College Mathematics Grades: Gender Differences in a 4- Year Business College. *Journal of Education for Business.*

Papanastasiou, C. (2008). A Residual Analysis of Effective Schools and Effective Teaching in Mathematics. *Studies in Educational Evaluation* 34, 24-30.

Patterson, M. et. Al (2003). Factors associated with high school mathematics performancein the United States. *Studies in Educational Evaluation* 29, 91-108.

Russo, J., Bobis, J., Downton, A., Hughes, S., Livy, S., McCormick, M., & Sullivan, P. (2020). Elementary teachers' beliefs on the role of struggle in the mathematics classroom. *The Journal of Mathematical Behavior,* 58, 100774. https://doi.org/10.1016/j.jmathb.2020.100774

Steinback, M., and Gwizdala, J. (1995). Gender differences in mathematics attitudes of secondary students. . School Science and Mathematics, 95, 36-41.

Stevens, J. J., Schulte, A. C., Elliott, S. N., Nese, J. F. T., & Tindal, G. (2015). Growth and gaps in mathematics achievement of students with and without disabilities on a statewide achievement test. *Journal of School Psychology*, *53*, 45–62.

Sun, K. L. (2019). The mindset disconnect in mathematics teaching: A qualitative analysis of classroom instruction. *The Journal of Mathematical Behavior,* 56, 100706. https://doi.org/10.1016/j.jmathb.2019.04.005

Swanson, H. L., Lussier, C. M., & Orosco, M. J. (2013). Cognitive strategies, working memory, and growth in word problem solving in children with math difficulties. *Journal of Learning Disabilities*, *48*, 339–358.

TarzimahbintiTambychik (2005)PenggunaanKaedahNemonikBeriramadalamPembelajaranMatematikbagiPelajarLemah: Satu Kajian kes. Tesis Sarjana. UniversitiKebangsaan Malaysia.

Tay Lay Heong (2005). Problem Solving Abilities and Strategies in Solving Multistep Mathematical Problems among Form 2 Students. KertasProjek Sarjana. Universiti Malaya.

T. Subahan Mohd Meerah (2007). Problem Solving and Human Capital. Proceedings of the Third International Conference on Research and Education in Mathematics (ICREM3).INSPEM: Universiti Putra Malaysia

Walter J. G. & Hart, J. (2009). Understanding the complexities of student motivations in mathematics learning. Journal of Mathematical Behavior 28,162–170.

Yilmaz, C., Altun, S. A. &Olkun, S. (2010). Factors affecting students' attitude towards maths: ABC theory and its reflection on practice. *Procedia Social Behavorial Sciences* 2, 4502-4506.

Zahrah Abd Kadir, Jamaliah Bejor, Rohana Nathiman, BadariahMoamed& Jaafar Khamis (2003). Meningkatkan Kemahiran MembentukUngkapanKuadratik. *JurnalPenyelidikan Pendidikan,* Jld 7: 12– 19.

Zhang, D., Xin, Y. P., Harris, K., & Ding, Y. (2014). Improving multiplication strategic development in children with math difficulties. *Learning Disability Quarterly*, *37*, 15–30.

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