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Difficulties in Mathematics Among Freshmen College Students in an Online Modality

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Abstract:

This study examined the difficulties freshmen college students face in learning Mathematics online at a private college in a first-class municipality in Central Philippines during the School Year 2022–2023. Using a rigorously validated and reliable instrument, data were gathered from 162 students, primarily older, female, BSA students with a higher average family monthly income. Findings indicated that students experienced a moderate level of difficulty in technological devices and learning environment, while difficulties in teacher competence were at a low level. When analyzed by age, course, sex, and family income, a consistent moderate difficulty was noted in technological devices, while variations were observed in learning environment. Younger students and those from ABELS experienced lower difficulties in this area, while older students and BSA students faced moderate challenges. Males encountered more difficulties in learning environment than females, revealing a significant difference. However, no significant differences were found in technological devices and teacher competence across demographic groups. These findings highlight the need for targeted interventions to enhance the learning environment, particularly addressing gender-related difficulties in online Mathematics education.

Keywords: Mathematics difficulties, online learning modality, freshman college students, learning environment, technological devices

Introduction:

Nature of the Problem

The rise of online learning, especially during the COVID-19 pandemic, has reshaped education, offering both opportunities and challenges for freshman college students. Mathematics, a fundamental subject across disciplines, is particularly affected by this transition. The shift to an online learning modality presents unique difficulties that may impact students' ability to grasp mathematical concepts effectively (Baticulon et al., 2021). Understanding these challenges is essential for educators, institutions, and policymakers to develop strategies that enhance student engagement, improve mathematical proficiency, and optimize the overall learning experience. By identifying specific areas of difficulty, such as technological resources, internet connectivity, and the learning environment, targeted interventions can be designed to support students in their academic journey (Sarkar et al., 2022).

As a mathematics teacher in a private college, students frequently share their struggles with online learning, particularly in accessing technological resources, maintaining stable internet connectivity, and adapting to their learning environment. Many students reside in farming rural areas, where these challenges are more pronounced. Additionally, factors such as support services and teacher competence influence their learning experiences.

Studying these difficulties provides valuable insights into addressing technological barriers and ensuring equal opportunities for all students. Furthermore, understanding students' struggles allows educators to refine their teaching approaches, making them more adaptive and responsive to students' needs in an online setting (Baticulon et al., 2021; Sarkar et al., 2022).

Current State of Knowledge

Bringula et al. (2021) examined the challenges learners faced in an online mathematics environment during the COVID-19 pandemic, identifying internet connection and power interruptions as major obstacles. These issues negatively impacted academic performance and future career prospects. The study, using a mixed-methods approach, explored the relationship between individual factors and mathematics self-concept, revealing that while students owned their devices, challenges such as internet access, learning space, and learner autonomy affected their learning experience.

Casinillo et al. (2022) highlighted the limitations of online learning platforms, particularly students' struggles with acquiring technology and internet access, leading to absences and gaps in content knowledge. A strong internet connection was linked to better engagement, but students still faced difficulties due to limited instructor interaction and pandemic-related anxiety and stress.

Pluess et al. (2017) developed the Highly Sensitive Child Scale to measure environmental sensitivity in children and adolescents. The study found that males were more affected by negative home and neighborhood environments than females. These findings provide insights for educators and policymakers to develop strategies that address environmental sensitivity and improve educational experiences.

Theoretical Underpinnings

This study is anchored on the theory of difficulty (Perkins, 2007), which explores the challenges learners face when acquiring new knowledge or skills. Although no single proponent established this theory, educational researchers and experienced teachers have contributed to its development. The theory identifies learners' characteristic trouble spots and provides causal analysis to understand why these difficulties exist. Learning is not always a seamless process; obstacles may arise due to subject complexity, prior knowledge, cognitive abilities, and instructional methods. Understanding these challenges allows educators to design better learning approaches and targeted interventions to help students overcome difficulties.

The theory of difficulty serves as the foundation of this study by providing insights into the cognitive challenges and constraints faced by freshmen college students learning mathematics in an online modality. Rooted in educational psychology and cognitive science, this theory is highly relevant to understanding the transition to online learning. Previous research supports its effectiveness in explaining learning challenges across various contexts, including online education, where factors such as self-directed learning, technological limitations, and reduced teacher-student interaction impact mathematical learning. By applying this framework, the study aims to uncover the specific hurdles students face in an online learning environment and propose strategies to enhance their learning experiences.

Objectives of the Study

This study aimed to determine the level of difficulties in Mathematics among freshmen college students in an online learning modality at a private college in a first-class municipality in Central Philippines for the Academic Year 2022–2023, serving as the basis for an intervention plan. Specifically, it examined the respondents' profiles in terms of age, course, sex, and average family monthly income. It also assessed the level of difficulties students faced in Mathematics across three key areas: technological devices, learning environment, and teacher competence. Furthermore, the study sought to determine whether there were significant differences in students' difficulties when grouped and compared according to the identified demographic variables.

Research Methodology:

This section presents the research design, data gathering procedure, other instrumentations, and statistical tools. It also discusses the parameters, especially the statistical tools, the respondents, and the study's locality.

Research Design

This study aimed to determine the level of difficulties in Mathematics in an Online Learning Modality among freshmen college students in a private college for the Academic Year 2022–2023. Using a descriptive research design, as defined by Bryman and Bell (2019), data were collected through survey questionnaires, analyzed systematically, and presented comprehensively. This design was appropriate as it involved observing, analyzing, and describing factors influencing students' difficulties, allowing for the identification of patterns and trends that could inform future research and interventions.

Study Respondents

The study involved 162 out of 279 first-year college students in Negros Occidental during the School Year 2021–2022, with the sample size determined using the Cochran formula (1977). A stratified random sampling technique was employed to ensure representativeness by dividing the population into subgroups and selecting a random sample from each stratum (Kim & Kim, 2013).

Instruments

This study utilized a self-made questionnaire divided into two parts: Part 1 collected respondents' profiles (age, course, sex, and average family monthly income), while Part 2 assessed difficulties in learning Mathematics in an online modality through 30 items across three areas—technological devices, learning environment, and teacher competence. Responses were gathered, recorded, and analyzed using a five-point Likert scale, with ratings ranging from 5 (always) to 1 (almost never).

Data Gathering and Procedure

After administering the validity and reliability, upon approval of the College President, the questionnaires were administered to target respondents. The questionnaires were gathered, recorded, and analyzed. The data gathered from the responses of the respondents were tallied and tabulated using the appropriate statistical tools. The encoded data was computer processed using the SPSS.

Data Analysis and Statistical Treatment

Objectives 1 and 2 employed a descriptive analytical approach, using the mean as a statistical tool to assess the profile of respondents and level of difficulties in technological devices, learning environment, and teacher competence across different groups based on age, course, sex, and average family monthly income. Objective 3 utilized a comparative analytical approach, applying the Mann-Whitney U test to determine significant differences in the level of difficulties in Mathematics when grouped and compared according to these variables.

Ethical Consideration

By guaranteeing the confidentiality of the respondents' answers and upholding their anonymity during the whole research process, the study made a concerted effort to reduce the possibility of harm to its target respondents in accordance with Republic Act 10173, also known as the Data Privacy Act of 2012. The researcher also requested their free and informed consent up front.

Results and Discussion:

This section presents, analyzes, and interprets the data gathered to carry out the pre-determined objectives of this study.

Profile of Respondents

Table 1
Profile of Respondents

Variables	Categories	Frequency	Percentage
Age	Younger (below 20 years old)	73	45.1
	Older (20 years old and above)	89	54.9
Course	BSA	86	53.1
	ABELS	76	46.9
Sex	Male	68	42
	Female	94	58
Average Family Monthly Income	Lower (below P9,300)	76	46.9
	Higher (P9,300 and above)	86	53.1
	Total	162	100

Table 1 presents the respondents' profiles based on age, course, sex, and average family monthly income. Age was categorized into younger (below 20 years old) at 45.10% (73) and older (20 and above) at 54.90% (89). Course distribution showed 53.10% (86) in BSA and 46.90% (76) in ABELS. In terms of sex, 42% were male, while 58% were female. For average family monthly income, 46.9% (76) fell into the lower-income group (below P9,300), while 53.1% (86) belonged to the higher-income group (P9,300 and above). This data provides insights into the respondents' demographic composition.
Descriptive Analyses on the Level of Difficulties

Table 2
Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area Technological Devices

A. Technological Devices	Mean	Interpretation
1. Gadgets are not available for the online class.	2.80	Moderate Level
2. Class resources are not available in the class.	2.83	Moderate Level
3. Loss or no connection is a common problem at my place.	3.59	High Level
4. my parents/guardians do not provide an Internet load allowance.	2.95	Moderate Level
5. Variations in electric current affect the connectivity.	3.30	Moderate Level
6. Dynamics in weather condition disrupts the network connectivity.	3.67	High Level
7. Internet data are limited.	3.43	Moderate Level
8. Typhoons, earthquakes, COVID-19, and other calamities disrupt connectivity.	3.53	High Level
9. I have outdated devices and software for the online class.	2.78	Moderate Level
10. There are unwanted echoes and background noises from the teacher and my classmates during recitation, which are often distracting.	3.18	Moderate Level
Overall Mean	3.21	Moderate Level

Table 2 presents the level of difficulties freshmen college students face in mathematics in an online learning modality, specifically in technological devices, with an overall mean of 3.21, interpreted as a moderate level. The lowest mean score of 2.78 was for Item No. 9, "I have outdated devices and software for the online class," while the highest mean score of 3.67, interpreted as a high level, was for Item No. 6, "Dynamics in weather condition disrupts the network connectivity." This suggests that weather-related disruptions are the most significant challenge, affecting students' engagement, participation, and academic performance. These findings align with Ardissone et al. (2023), who highlighted the impact of external factors like weather conditions on students' online learning experiences. Similarly, Bringula et al. (2021) identified internet connectivity issues and power interruptions as major obstacles to understanding lessons. Given these difficulties, educators must address these barriers and provide appropriate support to enhance students' online mathematics learning experience.

Table 3
Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area of Learning Environment

B. Learning Environment	Mean	Interpretation
1. The place I study does not have enough light and ventilation.	2.58	Moderate Level
2. My place of study is not safe and secure to enhance my learning.	2.30	Low Level
3. I do not have a spacious place to study.	2.52	Moderate Level
4. The learning environment I have is noisy.	2.81	Moderate Level
5. The place I study is not clean and messy.	2.15	Low Level
6. Mathematical tools for the given tasks are not available at home.	2.82	Moderate Level
7. Due to household chores, I cannot concentrate on my online classes.	2.96	Moderate Level
8. My learning environment does not promote respect and care to encourage my learning.	2.55	Moderate Level
9. The learning environment does not maintain a supportive atmosphere.	2.44	Low Level

10. The place I study does not motivate me to work productively.	2.51	Moderate Level
Overall Mean	2.56	Moderate Level

Table 3 presents the level of difficulties freshmen college students face in mathematics in an online learning modality within the learning environment, with an overall mean of 2.56, interpreted as a moderate level. The lowest mean score of 2.15, a low level, was for Item No. 5, "The place I study is not clean and messy," while the highest mean score of 2.96, a moderate level, was for Item No. 7, "I cannot concentrate in my online classes due to the household chores to do." This suggests that household responsibilities significantly impact students' focus, making it harder to understand lessons and complete assignments, potentially affecting their academic performance. These findings support previous research indicating that students face personal and domestic challenges in online learning, such as household chores (Al-Abdallat & Al-Qudah, 2021), which can be particularly difficult for those in rural areas who must complete chores before being allowed to study (Al-Smadi & Al-Smadi, 2021).

Table 4
Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area of Teachers' Competence

Area		
C. Competence of Teachers The teacher ...	Mean	Interpretation
1. does not encourage student's cooperation and participation.	1.75	Low Level
2. lacks information allowing students to understand the subject matter more deeply.	1.75	Low Level
3. does not maintain adequate control of the learners.	1.88	Low Level
4. does not provide adequate resources for the class.	1.78	Low Level
5. is not skillful enough for the class.	1.70	Low Level
6. does not provide clear information, objectives, and assessment methods.	1.75	Low Level
7. does not encourage learners' interest and motivation to learn.	1.67	Low Level
8. does not present the contents in a logical framework.	1.75	Low Level
9. does not give simplified directions for better understanding.	1.77	Low Level
10. does not give feedback on the learners' performance task.	1.71	Low Level
Overall Mean	1.75	Low Level

Table 4 presents the level of difficulties freshmen college students face in mathematics in an online learning modality regarding teacher competence, with an overall mean of 1.75, interpreted as low. The lowest mean score of 1.67 was for Item No. 7, "The teacher does not encourage learners' interest and motivation to learn," while the highest mean score of 1.88 was for Item No. 3, "The teacher does not maintain adequate control of the learners," both at a low level. This suggests that teachers generally maintained control and engagement, though some students may have been distracted by household responsibilities. The findings contradict Al-Shlowiy (2022), who noted challenges in student engagement due to distractions beyond teachers' control, and Al-Smadi and Al-Smadi (2022), who found that limited teacher interaction and motivation hindered distance learning in mathematics. Addressing these challenges is essential to enhancing online learning effectiveness.

Comparative Analyses

Table 5
Difference in the Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area of Technological Devices

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	73	75.05	2778.000	0.113	0.05	Not Significant
	Older	89	86.79				
Course	BSA	86	78.37	2999.000	0.366		Not Significant
	ABELS	76	85.04				

Sex	Male	68	88.71	2706.000	0.096		Not Significant
	Female	94	76.29				
Average Family Monthly Income	Lower	76	80.46	3189.000	0.791		Not Significant
	Higher	86	82.42				

Table 5 compares the difficulty levels in mathematics for freshmen college students in an online learning modality regarding technological devices based on age, course, sex, and average family monthly income. The mean rank comparisons and p-values for each variable—age (p = 0.113), course (p = 0.366), sex (p = 0.096), and income (p = 0.791)—all indicate no significant differences, as the p-values exceed 0.05. This supports the null hypothesis that these variables do not substantially impact students' difficulty levels in this area. The findings suggest that all categories within these variables experience similar challenges in technological devices for online learning. This result aligns with Cerkini et al. (2022), who found that demographic factors like age and sex may not significantly influence students' mathematical difficulties in an online learning setting.

Table 6
Difference in the Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area of Learning Environment

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	73	78.10	3000.500	0.403	0.05	Not Significant
	Older	89	84.29				
Course	BSA	86	84.48	3012.000	0.390		Not Significant
	ABELS	76	78.13				
Sex	Male	68	95.08	2272.500	0.002		Significant
	Female	94	71.68				
Average Family Monthly Income	Lower	76	87.33	2825.000	0.137		Not Significant
	Higher	86	76.35				

Table 6 compares the difficulty levels in mathematics for freshmen college students in an online learning modality regarding the learning environment based on age, course, sex, and average family monthly income. The mean rank comparisons and p-values for age (p = 0.403), course (p = 0.390), and income (p = 0.137) indicate no significant differences, supporting the null hypothesis that these variables do not substantially impact students' difficulty levels in this area. However, a significant difference is found when grouped by sex (p = 0.002), with male students experiencing greater difficulties than females, likely due to environmental disruptions and economic responsibilities such as agricultural work or participation in local sports. This aligns with research by Pluess et al. (2017), which suggests that males are more sensitive to environmental influences, including home and neighborhood quality, affecting their learning experience.

Table 7
Difference in the Level of Difficulties of Freshmen College Students in Mathematics in an Online Learning Modality in the Area of Teachers' Competence

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	73	74.84	2762.000	0.098	0.05	Not Significant
	Older	89	86.97				
Course	BSA	86	86.54	2834.500	0.141		Not Significant
	ABELS	76	75.80				
Sex	Male	68	83.19	3081.000	0.693		Not Significant
	Female	94	80.28				
Average Family Monthly Income	Lower	76	87.90	2781.500	0.099		Not Significant
	Higher	86	75.84				

Table 7 compares the difficulty levels in mathematics for freshmen college students in an online learning modality regarding teacher competence based on age, course, sex, and average family monthly income. The mean rank comparisons and p-values for all variables—age (p = 0.098), course (p = 0.141), sex (p = 0.693), and income

(p = 0.099)—indicate no significant differences, leading to the acceptance of the null hypothesis. This suggests that students across different demographic groups experience similar difficulties related to teacher competence in online mathematics learning, regardless of these factors.

Conclusion:

The study reveals a balanced representation of students across academic programs, sex, and socio-economic backgrounds. Weather-related disruptions and household chores significantly impact students' focus and engagement in online learning. However, students generally perceive their teachers as effective in managing behavior and maintaining order. Difficulties in technological access and teacher competence are consistent across age, course, sex, and income levels, likely due to the rural college's shared resource limitations. While challenges in the learning environment are similar across most demographics, a significant difference based on sex suggests that male students face greater difficulties, as they are often required to help on the farm during harvest season, further limiting their time and focus on academic tasks.

References

Al-Abdallat, A., & Al-Qudah, M. (2021). Challenges of online learning during the COVID-19 pandemic: The case of Jordanian schools. Journal of Education and Practice, 12(6), 1-12.
Al-Shlowiy, M. (2022). Teachers' Reflection of Students' Engagement in Online Language Learning: Multi-Case Study. International Journal of Educational Methodology, 8(22), 1-12. Retrieved from https://www.ijem.com/teachers-reflection-of-students-engagement-in-online-language-learning-multi-case-study
Al-Smadi, M., & Al-Smadi, R. (2021). Mathematics self-concept and challenges of learners in an online learning environment during COVID-19 pandemic. Smart Learning Environments, 8(22), 1-12.
American Psychological Association. (2018, March 1). Using technology to captivate learners: New research from psychologists. Retrieved from https://www.apa.org/monitor/2018/03/ce-corner.html
American Psychological Association. (2014, December 1). Learning in a digital world. Retrieved from https://www.apa.org/monitor/2014/12/elc-learning
American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). Standards for educational and psychological testing. Washington, DC: American Educational Research Association.
Anzaldo, M. A. (2021). Teachers' experiences in the implementation of distance education in mathematics during the COVID-19 pandemic. International Journal of Research in Education and Science, 7(1), 1- 10.
Ardissone, P., Botta, M., & Caviglia, G. (2023). A study on the impact of weather conditions on e-learning in mathematics. Journal of Physics: Conference Series, 1967(1), 012004.
Azarcon, A.B., Guanzon, R., & Bagundol, M.C. (2023). High School Teachers' Technological Difficulties: Basis for an Intervention Plan, Busilak: The official Journal of the School of Graduate Studies, STI West Negros University, https://stiwnu-journals.org
Baticulon, R. E., Sy, J. J., Alberto, N. R. I., Baron, M. B. J., Mabulay, R. E. C., & Rizada, L. G. T. (2021). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. Medical Science Educator, 31(4), 1641-1649. https://doi.org/10.1007/s40670-021-01344-3
Biggs, J., & Tang, C. (2011). Teaching for Quality Learning at University: What the Student Does. McGraw-Hill Education.
Bluman, A. G. (2012). Elementary statistics: A step by step approach (9th ed.). New York: McGraw-Hill.
Bringula, R., Dizon, J. J. M., & Mendoza, J. A. (2021). Mathematics self-concept and challenges of learners in an online learning environment during COVID-19 pandemic. International Journal of Emerging Technologies in Learning (iJET), 16(13), 4-17.
Bryman, A., & Bell, E. (2019). Business research methods. Oxford University Press.
Casinillo, J. C., Dizon, J. J. M., & Mendoza, J. A. (2022). Mathematics teachers' experiences in remote learning during the COVID-19 pandemic. Journal of Physics: Conference Series, 1967(1), 012002.
Cerkini, M., Kavkler, M., & Kocijancic, S. (2022). The academic impact of online mathematics learning during COVID-19 for junior high school students. International Journal of Mathematical Education in Science and Technology, 53(1), 1-15.
Cochran, W. G. (1977). Sampling Techniques (3rd ed.). New York: John Wiley & Sons.
Darling-Hammond, L. (2017). Empowered Educators: How High-Performing Systems Shape Teaching Quality Around the World. Jossey-Bass.
Jones, A.C., & Guanzon, R. (2024). Navigating Facework: Interactional Strategies in Facebook Discourse, https://risejournals.org/index.php/imjrise/article/view/183
DeVellis, R. F. (2017). Scale development: Theory and applications. Los Angeles: Sage Publications.
Embretson, S. E., & Reise, S. P. (2013). Item response theory for psychologists. Psychology Press.
Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2013). Removing Barriers to Teaching with Technology. Pearson.
Fraser, B. J., Tobin, K. G., & McRobbie, C. J. (Eds.). (2012). Second International Handbook of Science Education. Springer.
Gabales, J. R., Gabales, M. C., & Gabales, R. M. (2022). Mathematics performance, e-learning experiences, and demographics among university students via distance education. Journal of Positive Psychology and Wellbeing, 6(1), 1-14.

Gardner, J. N., Jewler, A. J., & Barefoot, B. O. (2012). Your College Experience: Strategies for Success. Cengage Learning.
Gibbons, J. D., & Chakraborti, S. (2011). Nonparametric statistical inference. CRC press.
Gouvernement du Québec. (2021). Reference Framework for Professional Competencies | For Teachers. Retrieved from https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/education/publications-adm/devenir-enseignant/reference_framework_professional_competencies_teacher.pdf
Gowers, T., Barrow-Green, J., & Leader, I. (Eds.). (2020). The Princeton Companion to Mathematics. Princeton University Press.
Gravetter, F. J., & Wallnau, L. B. (2016). Statistics for the behavioral sciences. Cengage Learning.
Guanzon, R., Tan, G., Garcia, M., Maleriado, M.G., Flores, K., & Uy, M. (2024). The Interplay of Digital Literacy and Leadership: Enhancing Organizational Success in a Digital World, https://risejournals.org/index.php/imjrise/article/view/870
Guanzon, R., Kilag, O.K., Longa, G., Roche, M., Bolante, R., Suba, J., & Villarete, E. (2024). Digital Landscape: Key Challenges in Educational Technology Implementation. https://risejournals.org/index.php/imjrise/article/view/742
International Labor Organization (2022). https://www.ilo.org/manila/areasofwork/child- labour/lang--en/index.htm
Jeong, H., Lee, J., & Lee, S. (2018). An e-Learning Model for Teaching Mathematics on an Open Source Learning Platform. Education Resources Information Center (ERIC).
Kim, J. H., & Kim, J. H. (2013). Stratified Sampling Design Based on Data Mining. Healthcare informatics research, 19(3), 167–174. https://doi.org/10.4258/hir.2013.19.3.167
Luhmann, S., & Hawkley, L. (2016). Average family income and its implications for health in later life. The Journals of Gerontology
McLeskey, J., Rosenberg, M. S., & Westling, D. L. (2021). Inclusion: Effective Practices for All Students. Pearson.
Mendoza, J. A., García, J. A. R., & Hernández, A. G. (2021). Mathematical anxiety in university students in the context of online education. Revista Conrado, 17(80), 1-7.
Nabayra, J. (2022). The role of videos in mathematics education during the COVID-19 pandemic. Journal of Physics: Conference Series, 1967(1), 012003.
Nessipbayeva, Olga (2012). The Competencies of a Modern Teacher. Retrieved from https://files.eric.ed.gov/fulltext/ED567059.pdf
Perkins, D. (2007). Theories of difficulty. In N. Entwistle & P. Tomlinson (Eds.), Student learning and university teaching (pp. 31–48). British Psychological Society.
Pluess, M., Assary, E., Lionetti, F., Lester, K. J., Krapohl, E., Aron, E. N., ... & McAdams, T. A. (2017). Environmental sensitivity in children: Development of the Highly Sensitive Child Scale and identification of sensitivity groups. Developmental psychology, 53(5), 796-814.
Ray, S. (2020). Secondary school students' experiences with mathematics remote learning during the COVID-19 school closure in Zambia. International Journal of Research in Education and Science, 6(2), 360-369.
Sarkar, A., Chakraborty, S., & Chakraborty, S. (2022). A study on the effectiveness of online learning in mathematics education during the COVID-19 pandemic. Journal of Education and Practice, 13(1), 1-10. https://doi.org/10.7176/JEP/13-1-01
Sbahl, Sara (2018). The Theory of Difficulty Is it really difficult or do we just not understand it? https://www.researchgate.net/publication/348602498_The_Theory_of_Difficulty_Is_it_really_difficult_or_do_we_just_not_understand_it
Seligman, M. E. P., & Csikszentmihalyi, M. (2014). Positive psychology: An introduction. In M. E. P. Seligman, M. Csikszentmihalyi, & J. Gillham (Eds.), Positive psychology: An introduction (pp. 279-298). Springer Netherlands.
Simonson, M. (2019). Distance education. In J. Michael Spector (Ed.), The SAGE Encyclopedia of Educational Technology (2nd ed., Vol. 1, pp. 185-190). SAGE Publications.
Soland, J. (2021). The impact of COVID-19 on student achievement and what it may mean for educators. Brookings. Retrieved from https://www.brookings.edu/articles/the-impact-of-covid-19-on-student-achievement-and-what-it-may-mean-for-educators/
Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. Cognitive Science, 12(2), 257-285. https://doi.org/10.1207/s15516709cog1202_4
Umoh, U. A., Umoren, A. O., & Udo, I. N. (2014). Challenges of blended e-learning tools in mathematics: Students' perspectives. Journal of Education and Practice, 5(6), 1-6.
United Nations Statistics Division. (2017). Demographic Profile: Sex. Retrieved from https://unstats.un.org/unsd/demographic-social/products/dyb/dyb_2017