

Microlearning Video Lessons and Pupils' Confidence

Cindy F. Barocol¹, Crystal Jade S. Mongas²

¹Southern de Oro Philippines College, Cagayan de Oro City, Philippines

²DepEd-Division of Bukidnon, Bukidnon, Philippines

ABSTRACT: Pupils' confidence plays an essential role in shaping learning outcomes and overall academic success. This study aimed to determine the extent of microlearning video lessons, the level of pupils' confidence, and the relationship between the two variables. This study used descriptive correlational research design to assess how Microlearning videos affect the pupils' confidence level. The respondents of this study were limited to 242 Grade 6 pupils in the Balingasag District, Division of Misamis Oriental. A researcher-made and validated questionnaire was used as the primary research instrument. Data were analyzed using statistical tools such as Mean and Standard Deviation Pearson Product Moment Correlation Coefficient, and Multiple Linear Regression. Results revealed that microlearning video lessons are Very Effective. Pupils' confidence was also rated Very High. There is a significant low to moderate positive correlation between the extent of video lessons and pupils' confidence. It is concluded that microlearning video lessons are effective and positively associated with pupils' confidence. Pupils' confidence enables them to achieve their goals and objectives. It is recommended that teachers may continue integrating microlearning video lessons, particularly for enhancing spatial reasoning skills, as they have shown high effectiveness in this area.

KEYWORDS: Microlearning, pupils' confidence, teaching, video lessons

I. INTRODUCTION

In the field of education, pupils' confidence plays a critical role in shaping learning outcomes and overall academic success. Confidence influences how pupils approach learning tasks, their persistence in overcoming challenges, and their overall motivation to succeed. The emergence of microlearning is causing a significant shift in the educational landscape.

According to Almarashdeh (2020), microlearning methods significantly improved pupils' motivation and self-efficacy, laying the foundation for greater confidence in their academic performance. The integration of microlearning through video lessons has gained increasing attention in modern educational environments, particularly for its potential to enhance pupil engagement and self-confidence. Microlearning, characterized by short, focused bursts of learning, allows pupils to consume content at their own pace, promoting a more personalized and stress-free educational experience.

Also, one key benefit of microlearning is its compatibility with digital platforms, which makes it more accessible to a broader range of pupils, including those with learning difficulties or those in remote areas. The rise of mobile technologies and digital literacy among school-aged children has made video-based microlearning a feasible and appealing approach. Research by Müller and Mildenberger (2021) highlighted that short instructional videos help learners retain information more effectively while simultaneously increasing their confidence in applying new concepts.

Moreover, the format of microlearning supports active learning by allowing students to pause, replay, and review content, thus fostering a deeper understanding. This autonomy over learning enhances a sense of competence among pupils. As supported by Peters et al. (2022), pupils who engaged in microlearning video modules showed a marked improvement in their self-assessment scores, it suggested an upward shift in their academic self-confidence.

Consequently, educators have also observed improvements in classroom dynamics when integrating microlearning into their teaching strategies. It allows for differentiated instruction, enabling teachers to cater to individual learning needs while encouraging peer discussion and collaboration. Jones and Rivera (2023) found that pupils participating in video-based microlearning lessons demonstrated greater willingness to engage in classroom discourse, a key indicator of growing self-confidence.

Microlearning Video Lessons and Pupils' Confidence

Furthermore, the adaptability of microlearning content makes it ideal for formative assessment and continuous feedback, which are crucial for building learner confidence over time. Through analytics and interactive elements, teachers can track progress and provide timely support, reinforcing pupils' belief in their capabilities. As noted by Zhang et al. (2024), incorporating interactive microlearning videos into curriculum design led to significant gains in learners' perceived confidence and academic persistence. Thus, the researcher explored the relationship between microlearning video lessons and pupils' confidence that will focus on how these tools can be utilized to maximize involvement and learning outcomes.

This study was anchored on the Multimedia Learning Theory (MLT) by Mayer (2022). This theory describes that the pupils will benefit when multiple learning channels are integrated into instruction and learn more deeply from words and pictures than from words alone. Microlearning video lessons, which combine auditory and visual content in short, focused segments, align strongly with the core principles of MLT. The theory emphasizes that learning is more effective when instructional materials integrate multiple sensory inputs that work cohesively to reduce cognitive overload and promote understanding.

Recent studies highlight the alignment of microlearning strategies with the tenets of MLT. For instance, research by Geng et al. (2021) found that short, multimedia-based learning modules significantly improved student engagement and self-efficacy compared to traditional text-based instruction. This reinforces the idea that breaking down complex content into bite-sized video lessons enhances cognitive processing, which can lead to increased pupil confidence, especially when learners perceived the material as more manageable and less intimidating.

Furthermore, Mayer's theory emphasizes the importance of coherence and signaling principles in video-based learning, which are critical components of microlearning design. Microlearning videos often use focused narration, minimal extraneous content, and clear visual markers, all of which help learners maintain attention and comprehend better. Supporting this, Ko and Rossen (2020) argued that multimedia design principles, when properly applied, increase student motivation and self-assurance, particularly among younger learners, which this study sought to explore in relation to pupil confidence.

The effectiveness of microlearning videos in improving learners' self-perception has also been examined in the context of student-centered pedagogies. According to Wang and Antonenko (2021), multimedia resources, especially those with interactive and concise elements, empower learners to control their pace and revisit materials, contributing to a sense of autonomy and confidence. This directly ties to the concept of self-regulated learning within MLT, suggesting that the design of microlearning videos can support metacognitive development among pupils.

Additionally, MLT provides a framework for understanding how visual and auditory stimuli can create a more engaging and emotionally supportive learning environment. This is vital for younger students whose confidence may be fragile and heavily influenced by their learning experiences. A study by Zhang et al. (2023) demonstrated that learners exposed to visually rich, narratively structured videos reported higher levels of learning satisfaction and self-confidence. The current study leverages this insight by examining whether microlearning videos designed under MLT principles contribute to increased confidence in pupils.

II. METHODOLOGY

This study employed a descriptive correlational and causal research designs to explore the relationship between microlearning videos and pupils' confidence levels. It was descriptive in nature as it aimed to gather current data on pupils' experiences with microlearning videos and assess their self-reported confidence levels. At the same time, it was correlational because it involved collecting quantitative data on two variables used of microlearning videos and pupils' confidence from the same group of respondents and statistically analyzing the strength and direction of their relationship. Descriptive correlational research is particularly suitable when researchers seek to understand patterns and associations between variables without manipulating them or inferring causality. As noted by Creswell and Guetterman (2021), correlational designs are ideal for educational settings where the goal is to describe relationships that naturally occur, especially when experimental control is not feasible or ethical. This was also causal since it identified and analyzed the nature and extent of relationships between variables (Dovetail Editorial Team, 2023).

Problems 1 and 2 employed Mean and Standard Deviation. In Problem 3, Pearson Product Moment Correlation Coefficient was utilized to ascertain the presence and strength of a significant relationship between the interactive microlearning videos and pupils' confidence level. And Problem 4 utilized Multiple Linear Regression.

III. RESULTS AND DISCUSSION

Problem 1. What is the extent of microlearning video lessons in terms of:

- 1.1. cognitive processing and
- 1.2. spatial reasoning?

Microlearning Video Lessons and Pupils' Confidence

Table 1. Overall Microlearning Video Lessons

Variables	Mean	SD	Description	Interpretation
Cognitive Processing	4.30	0.52	Strongly Agree	Very Effective
Spatial Reasoning	4.31	0.52	Strongly Agree	Very Effective
Overall Mean	4.31	0.52	Strongly Agree	Very Effective
Note:	4.21-5.00 Very Effective	3.41-4.20 Effective	2.61-3.40 Fair	
	1.81-2.60 Less effective	1.00-1.80 Least Ineffective		

Table 1 shows the overall extent of microlearning video lessons. It registered an overall Mean of 4.31 with SD=0.52, described as Strongly Agree and interpreted as Very Effective. The data imply that the pupils believe in the effectiveness brought by the presence and integration of video lessons. The pupils feel that they can experience the best visualization of the lessons that they are studying, making it easier to understand and remember. The absence of manipulatives is no longer a problem as those complex problems can be studied and understood in a much easier way. According to Weppner et al. (2024) the importance of video lessons to the pupils is high. This is also advantageous to those that were absent during the class discussion as they can make a review via the video lessons. Remote learning made use of video lessons to help the students in their studies.

In the same table, the variable, *Spatial Reasoning*, was rated the highest with the Mean of 4.31 with SD=0.52, described as Strongly Agree and interpreted as Very Effective. The data imply that the pupils believed that video lessons has help them have the correct visualization of the objects and event events in a particular problem. Moreover, it also helps the pupils to have a simple recall to the lessons that they studied. According to Mutlu-Bayraktar et al. ,(2019) video lessons have provided better advantages for the pupils to study and learn new things. With this, studying becomes more inspiring, interesting and fun for the pupils as they can see and observe the visuals with the lessons that are presented to them.

Meanwhile, the variable, *Cognitive Processing*, was rated the lowest with a Mean of 4.30 with SD0.52, described as Strongly Agree and interpreted as Very Effective. The data imply that the pupils feel that with the aid of video lessons, they are able to formulate better and accurate responses and decisions because they were able to understand the given situations as well as the available data and clues because it was well presented in the video. The teacher no longer has difficult time making the pupils understand and visualize the scenario as there are available videos that represent the topic being discussed. According to Ekineh (2022) correct and proper selection of video lessons that will be presented to the pupils in a class is important. Teachers must consider the clarity of the audio and even the video itself so that it will surely help the pupils understand the lesson. Moreover, sources of the video must be checked if it comes from legit sites, or it contains fake data as it can confuse the pupils.

Problem 2. What is the level of pupils' confidence in terms of:

- 2.1 involvement; and
- 2.2 retention?

Table 2. Overall Pupils' Confidence

Variables	Mean	SD	Description	Interpretation
Involvement	4.31	0.52	Strongly Agree	Very High
Retention	4.28	0.53	Strongly Agree	Very High
Overall Mean	4.30	0.52	Strongly Agree	Very High
Note:	4.21-5.00 Very High	3.41-4.20 High	2.61-3.40 Average	
	1.81-2.60 Low	1.00-1.80 Very Low		

Table 2 shows the overall level of pupils' confidence. It registered an overall Mean of 4.30 with SD=0.52 described as Strongly Agree and interpreted as Very High Level. The data imply that the pupils' level of confidence is of the ideal level. This further means that the pupils are not afraid to express their thought to the class as well as not afraid of trying things knowing that they are supported and guided by their teachers and even parents. In this way, the pupils who become more productive can gain more knowledge and skills as they are confident in the things that they do. According to Villegas et al. (2023) pupils should be assisted and guided by the teachers in developing their confidence and self-esteem. Once the pupils have it, they will be able to achieve their goals and objectives and will not be afraid to fail and try new things.

In the same table, the variable, Involvement, was rated the highest with a Mean of 4.31 with SD=0.52, described as Strongly Agree and interpreted as Very High Level. The data imply that the pupils have high involvement in class activities because of their high confidence. The pupils express their thoughts and ideas and do not hesitate to ask questions for clarifications and to

Microlearning Video Lessons and Pupils' Confidence

satisfy their curiosity. This is an important indication of the performance of the pupils as well as their engagement to the lessons. According to Olutola et al. (2023) as well as Sumastre and Oco (2025) the pupils' involvement in class is important so that the teacher can gauge as to which part of the lesson requires more exercise and attention to make sure that the lesson was fully understood by the pupils. More so, it also indicates that the interest of the pupils in the lesson was high.

Meanwhile, the variable, Retention was rated the lowest with the Mean of 4.28 with SD=0.53 described as Strongly Agree and interpreted as Very High Level. The data imply that the pupils have a high level of remembering the lessons that they were able to tackle with the teacher. When the pupils' attention, interest and involvement is towards the lessons presented to them, it is easier for them to understand and even recall it when necessary. According to Alias et al. (2025) it is important to assist and give attention to the pupils' inquiries so that they will have their attention and focus towards the lesson. When the pupils are given attention, they feel that they are important and so they will get inspired to do their best and take their part in the teaching and learning process.

Problem 3. Is there a significant relationship between the extent of microlearning videos lessons and pupils' confidence?

Table 3. Test for Correlation Between Microlearning Video Lessons and Pupils' Confidence

Variables	r-value	p-value	Level of Correlation	Decision	Interpretation
Cognitive Processing	0.567	0.001	Moderate Positive Correlation	Reject Ho	Significant
Spatial Reasoning	0.243	0.021	Low Positive Correlation	Reject Ho	Significant

Note: 0.91 - 1.00 Very High Positive Correlation 0.71 – 0.90 High Positive Correlation
0.51 – 0.70 Moderate Positive Correlation 0.31 – 0.50 Low Positive Correlation
0.00 – 0.30 Negligible Positive Correlation *Significant when computed p-value <0.05*

Table 3 presents the Test of Correlation between Microlearning Video Lessons and Pupils' Confidence. For Cognitive Processing, it registered a computed r-value of 0.567 with the computed p-value of 0.001. The computed p-value is less than the critical p-value at 0.05 level of significance. This means that significant moderate positive relationship was registered between Microlearning Video Lessons and Pupils' Confidence when cognitive processing is taken into consideration. Thus, the null hypothesis is rejected.

Pupils' cognitive processing development is important for their growth and development as a person. This is because it means development of their brain and mind to become a more mature, responsible and sensible individuals. It will also help them in facing difficult situations in their future endeavors. According to McNeill and Fitch (2022) pupils' foundation or basic skills in developing their cognitive processing skills must be developed and mastered. Teachers should guide and assist them so that they can have better chances and performance as they go to higher level of learning and their pursuits of education.

For Spatial Reasoning, it registered a computed r-value of 0.243 with the computed p-value of 0.021. The computed p-value is less than the critical p-value at 0.05 level of significance. This means that significant low positive relationship was registered between Microlearning Videos Lesson and Pupils' Confidence when spatial reasoning is taken into consideration. Thus, the null hypothesis is rejected.

Spatial reasoning is something that pupils should also master and develop. This skill is necessary to determine and detect patterns which is crucial to studying major subjects as well as on solving complex equations and problems. When the pupils have the confidence, they will not stop studying the given data to solve the problem given to them because they have the skills in spatial reasoning and the confidence that they can overcome the obstacles individually or as a group. According to Paulus et al. (2022) when the pupils develop their spatial reasoning, they become more inclined to solving challenging problems as they find it exciting.

Problem 4. Which of the independent variables singly or in combination influenced the pupils' confidence?

Table 4. Multiple Linear Regression Analysis

Independent Variables	Unstandardized Coefficients		Standard Coefficient Beta		
	B	Std. Error	B	T	Sig.
(Constant)	0.211	0.161		1.306	0.193
Cognitive Processing	0.298	0.044	0.574	8.031	0.001
Spatial Reasoning	0.247	0.056	0.423	6.188	0.001
		R=0.712	R ² =0.615	F=21.184	Sig=0.000

Microlearning Video Lessons and Pupils' Confidence

- a. Dependent Variable: Culturally Responsive Teaching Pedagogy
- b. Predictors: (Constant), Teaching Methods, Cultural Integration, Assessment

Table 4 shows the Regression Analysis on microlearning video lessons and pupils' confidence. Cognitive Processing ($\beta=0.574$, t -value =8.031, p -value=0.00), and Spatial reasoning ($\beta=0.423$, t -value =6.188, p -value=0.001) has positively influenced the pupils' confidence. This implies that microlearning video lessons is consequential determinant to the pupils' confidence and is further explained the overall variance at 62% while the 38% were attributed to other factors that are not included in this study. Hence, Cognitive Processing and Spatial Reasoning are important factors in motivating and boosting pupils' confidence. The presence and utilization of microlearning video lessons in the teaching and learning activities of the pupils are essential and beneficial. Pupils find the lessons easier to relate and understand making them easier to engage in discussion and sharing of ideas as they are confident that they were able to understand the concepts presented to them. Pupils are well exposed to video related materials. So, when the teachers integrate the lesson with video, they get the attention and focus of the pupils leading to their better understanding and performance. Moreover, pupils have less struggles when given tasks without the presence of the teacher as they can watch the videos provided multiple times until they fully understood it. It has been determined by Weppner et al. (2024) that the significance of video courses to the students is quite high. Additionally, those individuals who were missing during the class discussion are able to revisit the material through the video courses, which is an advantage for them as well. For the purpose of assisting students with their academic pursuits, remote learning made use of video lessons.

IV. CONCLUSIONS

Based on the findings of this study, the following conclusions are formulated:

1. Microlearning video lessons is best utilized in classes to improve teaching and learning delivery.
2. Pupils' confidence are built when they have more involvement and retention in their classes.
3. Microlearning video lessons are associated with pupils' confidence.
4. The pupils' confidence in class participation, engagement and performance can be improved via integration of microlearning video lesson.

V. RECOMMENDATIONS

Based on the findings and conclusions of the study, it is recommended that the:

1. Teachers may continue integrating microlearning video lessons as it is a very effective strategy.
2. Teachers shall continue building confidence among pupils through improved teaching strategies.
3. Schools may consider adopting the utilization of microlearning video lessons to continually build the pupils' confidence.
4. School administrators may continue in investing of technology like television and computers to provide the teachers and pupils better ways of utilizing microlearning video lessons in their teaching and learning activities.

REFERENCES

- 1) Ahmad, H., & Jaradat, M. (2023). Educational Technology and the Future of Teaching: Preparing for the Challenges and Opportunities Ahead.
- 2) Al-Azawei, A., Parslow, P., & Lundqvist, K. (2020). The effect of multimedia learning principles on students' retention in online learning environments. *Education and Information Technologies*, 25(3), 2347–2366.
<https://doi.org/10.1007/s10639-019-10094-6>
- 3) Akiri, A. A. (2020). Teachers' Effectiveness and Students' Academic Performance in Public Secondary Schools in Delta State, Nigeria. *Studies on Home and Community Science*, 107–113.
- 4) Alias, N. F., & Razak, R. A. (2025). Revolutionizing learning in the digital age: A systematic literature review of microlearning strategies. *Interactive Learning Environments*, 33(1), 1–21.
- 5) Almarashdeh, I. (2020). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning. *Education and Information Technologies*, 25(5), 4693–4707.
<https://doi.org/10.1007/s10639-020-10155-1>
- 6) Brame, C. J. (2020). Effective educational videos: Principles and guidelines for maximizing cognitive processing. *CBE—Life Sciences Education*, 19(2), es25. <https://doi.org/10.1187/cbe.20-01-0003>
- 7) Çeken, B., & Taşkın, N. (2022). Multimedia learning principles in different learning environments: A systematic review. *Smart Learning Environments*, 9(1), 19.

- 8) Creswell, J. W., & Guetterman, T. C. (2021). Educational research: Planning, conducting, and evaluating quantitative and qualitative research (6th ed.). Pearson.
- 9) Danner, R. (2020). A Survey of ICT Competencies among Students in Teacher Preparation Programmes at the University of Benin, Benin City, Nigeria. Retrieved from Learn Tech Lib: <https://www.learntechlib.org/p/111349/>
- 10) Dixit, M., Khan, R., & Tan, A. (2021). Microlearning and flipped classrooms in online education: Improving engagement and comprehension. *Journal of Educational Practices*.
- 11) Ekineh, D. R. (2022). Flipped learning as an innovative teaching model in the 21st century. *Faculty of Natural and Applied Sciences Journal of Mathematics, and Science Education*, 3(2), 11–19.
- 12) Fiorella, L., & Mayer, R. E. (2021). Eight ways to promote generative learning. *Educational Psychology Review*, 33, 929–952. <https://doi.org/10.1007/s10648-020-09576-1>
- 13) Geng, S., Law, K. M. Y., & Niu, B. (2021). Investigating self-directed learning and learning satisfaction in online learning environment. *Education and Information Technologies*, 26(2), 1663–1679. <https://doi.org/10.1007/s10639-020-10344-5>
- 14) Harris, P. (2023). Cognitive development and the role of spatial reasoning in education. *Journal of Cognitive Development*, 19(2), 132–144. <https://doi.org/10.1016/j.jcd.2023.04.002>
- 15) Haryana, M. R. A., Warsono, S., Achjari, D., & Nahartyo, E. (2022). Virtual reality learning media with innovative learning materials to enhance individual learning outcomes based on cognitive load theory. *The International Journal of Management Education*, 20(3), 100657.
- 16) Hermiyati, N., Yurniwati, Y., & Yarmi, G. (2024). The Impact of Problem-Posing Learning Method on Critical Thinking Skills in terms of Self-Confidence. *Jurnal Elementaria Edukasia*, 7(2), 2570–2582.
- 17) Hernández, M. C., & Navarro, S. L. (2023). Enhancing student involvement through digital storytelling in primary education. *Journal of Educational Multimedia and Hypermedia*, 32(1), 77–92. <https://www.learntechlib.org/p/222765/>
- 18) Ismail, N. A., Mohd Razali, S. N. A., & Ahmad, S. A. (2023). The impact of microlearning videos on primary students' retention and motivation. *International Journal of Instruction*, 16(1), 45–60. <https://doi.org/10.29333/iji.2023.1614a>
- 19) Jerrim, J., Sims, S., & Oliver, M. (2023). Teacher self-efficacy and pupil achievement: much ado about nothing? *International evidence from TIMSS. Teachers and Teaching*, 29(2), 220–240.
- 20) Jones, R. M., & Rivera, C. J. (2023). Microlearning and classroom discourse: A case study in secondary education. *Teaching and Teacher Education*, 121, 103963. <https://doi.org/10.1016/j.tate.2022.103963>
- 21) Kiliç, E., & Yıldırım, İ. (2022). The effect of microlearning on student engagement and learning autonomy in blended classrooms. *Education and Information Technologies*, 27(4), 5439–5455. <https://doi.org/10.1007/s10639-021-10843-1>
- 22) Ko, S., & Rossen, S. (2020). *Teaching online: A practical guide* (4th ed.). Routledge.
- 23) Lee, J., & Lim, C. (2021). The impact of multimedia learning on young learners' engagement and motivation in e-learning environments. *Interactive Learning Environments*, 29(5), 743–758. <https://doi.org/10.1080/10494820.2019.1666289>
- 24) Mayer, R. E. (2022). Cognitive theory of multimedia learning. In R. E. Mayer & L. Fiorella (Eds.), *The Cambridge Handbook of Multimedia Learning* (3rd ed., pp. 57–72). Cambridge University Press
- 25) Mayer, R. E. (2022). *Multimedia learning* (3rd ed.). Cambridge University Press.
- 26) McNeill, L & Fitch D. (2022). Microlearning through the lens of Gagne's nine events of instruction: A qualitative study. *TechTrends*.
- 27) Müller, C., & Mildenberger, T. (2021). Facilitating flexible and self-directed learning: A qualitative study of video-based microlearning. *Journal of Computer Assisted Learning*, 37(6), 1579–1589. <https://doi.org/10.1111/jcal.12589>
- 28) Olutola, A. T., Adamu, D. R., & Okonkwo, C. O. (2023). Self-Confidence as Correlate of Senior Secondary School Students' Academic Performance in English Language. *British Journal of Education*, 11(3), 76–85.
- 29) Paulus, T., Jackson, M., & Nguyen, A. (2022). Improving spatial reasoning through microlearning in geometry education. *International Journal of Educational Research*, 65(3), 212–228. <https://doi.org/10.1016/j.ijer.2022.01.007>
- 30) Peters, J., De Bruyckere, P., & Kirschner, P. A. (2022). The effects of instructional video design on learning outcomes and self-efficacy in secondary education. *Computers & Education*, 181, 104451. <https://doi.org/10.1016/j.compedu.2022.104451>
- 31) Pillado, I. A., Futralan, M. C. Z., & Comighud, S. M. T. (2020). Factors on Memory Retention: Effect to Students' Academic Performance. *Factors on Memory Retention: Effect to Students' Academic Performance*, 6(4), 1–24.
- 32) Ramlatchan, P. (2019). Multimedia learning theory and its application in educational settings: A framework for effective instructional design. *Journal of Educational Multimedia and Hypermedia*, 28(1), 41–56. <https://doi.org/10.1016/j.jemh.2019.03.006>

- 33) Rhamadanty, T. (2023). Cognitive and child language development and involvement in learning. *Journal of Insan Mulia Education*, 1(2), 58–64. <https://doi.org/10.1016/j.jeva.2021.05.008>
- 34) Rini, R. M., & Nugroho, M. A. (2021). Microlearning implementation for student retention in digital classrooms. *Journal of Education and Learning (EduLearn)*, 15(4), 593–600. <https://doi.org/10.11591/edulearn.v15i4.20368>
- 35) Salas, S. (2021). Interactive microlearning videos in mathematics education: Enhancing engagement through quizzes and gamification. *Educational Media International*, 58(1), 63–77. <https://doi.org/10.1080/09523987.2021.1843417>
- 36) Santos, L. M., & Oliveira, T. A. (2023). Fostering self-confidence in elementary learners through self-paced digital learning environments. *Journal of Educational Psychology and Technology*, 5(1), 22–35. <https://doi.org/10.1016/j.jept.2023.01.004>
- 37) Setiawan, A., & Phillipson, S. (2021). The role of digital media in enhancing students' self-confidence and reducing classroom anxiety. *Asia Pacific Education Review*, 22(3), 455–468. <https://doi.org/10.1007/s12564-021-09689-5>
- 38) Söderberg, K. (2023). What's the deal with microlearning? [Online] Available: <http://urn.kb.se/resolve?urn=urn:nbn:se:ri:diva-64246>
- 39) Sumastre, M. F. & Oco, R. M. (2025). Teachers' Classroom Management Practices and Pupils' Self-Efficacy. *International Journal of Multidisciplinary Research and Analysis*. DOI: 10.47191/ijmra/v8-i04-13
- 40) Tharp, R. G. (2021). Microlearning in the digital age: Benefits and applications in mathematics instruction. *Educational Innovations*, 18(3), 233–246. <https://doi.org/10.1016/j.edinov.2021.02.006>
- 41) Thompson, R., & Bower, C. (2020). Microlearning videos and self-efficacy in mathematics education: An empirical study. *Journal of Educational Research*, 67(4), 112–125. <https://doi.org/10.1016/j.jedres.2020.01.008>
- 42) Tian, J., Ren, K., Newcombe, N. S., Weinraub, M., Vandell, D. L., & Gunderson, E. A. (2022). Tracing the origins of the STEM gender gap: the contribution of childhood spatial skills. *Developmental Science*, 26, e13302. <https://doi.org/10.1111/desc.13302>
- 43) Souza, V.C., Júnior, H.G., Da Rocha, E.P., Costa, V.R., & Narciso, R. (2024). Integration of technology in collaborative learning: Strategies and impacts on modern education. *RCMOS - Revista Científica Multidisciplinar O Saber*.
- 44) Usán Supervía, P., & Quílez Robres, A. (2021). Emotional regulation and academic performance in the academic context: The mediating role of self-efficacy in secondary education students. *International Journal of Environmental Research and Public Health*, 18(11), 5715.
- 45) Uttal, D. H., Miller, D. I., & Newcombe, N. S. (2024). Spatial thinking and its development: A comprehensive review. *Journal of Experimental Psychology: General*, 153(4), 522–537. <https://doi.org/10.1037/xge0001000>
- 46) Uttal, David H., et al. (2024). How can we best assess spatial skills? Practical and conceptual challenges. *Journal of Intelligence*, 12(1), 8.
- 47) Villegas-Ch, W., Govea, J., & Revelo-Tapia, S. (2023). Improving Student Retention in Institutions of Higher Education through Machine Learning: A Sustainable Approach. *Sustainability*, 15(19), 14512. <https://doi.org/10.3390/su151914512>
- 48) Wahab, J. A., & Ismail, H. N. (2022). Enhancing cognitive engagement through self-paced microlearning
- 49) Wang, Y., & Antonenko, P. (2021). Instructor presence in instructional videos: Effects on visual attention, recall, and perceived learning. *Computers in Human Behavior*, 118, 106678. <https://doi.org/10.1016/j.chb.2020.106678>
- 50) Weppner, J., Conti, A., Locklear, T. M., & Mayer, R. S. (2024). Traditional Lecture Versus Procedural Video Randomized Trial: Comparative Analysis of Instructional Methods for Teaching Baclofen Pump Management. *American Journal of Physical Medicine & Rehabilitation*, 10-1097.
- 51) Yusuf, A. F. (2020). Influence of principals' leadership styles on students' academic achievement in secondary schools. *Journal of Innovative Research in Management and Humanities*.
- 52) Zhang, Y., Li, W., & Thompson, S. (2024). The role of interactive microlearning videos in enhancing learner confidence and persistence. *Educational Technology Research and Development*, 72(1), 111–129. <https://doi.org/10.1007/s11423-024-10123-y>
- 53) Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2023). Instructional video design: Effective principles to promote learning confidence. *Journal of Educational Computing Research*, 61(1), 102–118. <https://doi.org/10.1177/0735633122111234>
- 54) Yoon, M., Lee, J., & Jo, I. H. (2021). Video learning analytics: Investigating behavioral patterns and learner clusters in video-based online learning. *The Internet and Higher Education*, 50, 100806.