



(RESEARCH ARTICLE)



## Enhancing the retentivity of students' phonological skills through digital micro-teaching

Ronil L. Roces \*

*Graduate Studies, Tabaco College, San Juan, Tabaco City, Philippines.*

International Journal of Science and Research Archive, 2026, 18(03), 711-719

Publication history: Received on 03 February 2026; revised on 08 March 2026; accepted on 11 March 2026

Article DOI: <https://doi.org/10.30574/ijrsra.2026.18.3.0514>

### Abstract

This study explored the effectiveness of digital micro-teaching as an instructional approach in enhancing the retention of phonological concepts which are essential aspects for oral communication among Grade 11 senior high school students of Tabaco National High School. The researcher has prepared instructional materials to enhance the phonological skills of his students. These drills focused on the production of critical vowel and consonant sounds, word and sentences stress, and phrasing. After a series of practice, students recorded their output through a voice message and post the output in the Messenger group chat. The teacher listened and checked the posted voice message. The descriptive evaluative method of research was used in this study. Also, a survey questionnaire on the factors affecting the phonological skills of students, another survey to assess the effectiveness of digital micro-teaching as intervention and the Likert Scale were the instruments utilized.

It was proven in this research that with the application of Digital Micro-teaching approach, the performance of students in speech delivery improved significantly. It is indeed a challenge in addressing the needs of the students, especially in the senior high school on how to develop their oral communication skills using the accessible online platforms that they already have at home. Since they belong to Generation Z or digital natives, they prefer technology-driven, interactive, and visual learning which require immediate feedback and real-world relevance. They value authentic learning, autonomy and collaboration. That is why, digital micro-teaching made them enjoy and engaged in learning the phonology skills.

**Keywords:** Digital Micro-teaching; Approach; Oral Communication; Likert Scale; Phonological concepts; Grade 11 senior high school students; Descriptive evaluative method

### 1. Introduction

In the classroom, oral communication skills are crucial for students as they prepare to enter higher education or the workforce, where clear and confident self-expression is increasingly valued. In phonology alone, many senior high school students showed difficulty. Without a grasp of phonology, communication can be severely impaired due to mispronunciation, misinterpretation of sounds, and difficulty in distinguishing between similar-sounding words. Students often struggle with phonology due to factors like lack of practice, lack of confidence, fear of making mistakes, and anxiety. This gap between needed and acquired phonological skills has brought attention to the importance of effective teaching strategies that can foster mastery of the competencies. Since schools are catering to the Generation Z, teaching approaches should be contextualized to their nature and interests. Approaches that are experiential, collaborative, technology-rich, and personalized make them enjoy and become engaged in the teaching and learning process. Moreover, students now tend to easily forget the concepts learned in the classrooms. It is then imperative to devise an innovation which would give students opportunity to review their lessons for mastery in a manner that would trigger their interest and engagement.

\* Corresponding author: Ronil L. Roces

This thesis explores the effectiveness of digital micro-teaching as an instructional approach in enhancing the retention of phonological concepts which are essential aspect for oral communication among senior high school students.

### **1.1. Statement of the Problem**

This study aims to improve the level of retentivity of phonological concepts of students using the digital micro-teaching approach. Specifically, it seeks to answer the following questions:

- What factors affect the students' level of retentivity of concepts in phonology?
- What is the level of effectiveness of the digital micro-teaching approach in the teaching of phonology?
- What are the characteristics of digital micro-teaching approach in phonology?
- What instructional materials can be developed to support the enhancement of retentivity of phonology through digital micro-teaching method?

---

## **2. Materials and Methods**

### **2.1. Research Method**

This part of the research is about the collection, organization, and interpretation of the data needed in the study.

Since the primary goal of the study is to provide a detailed and comprehensive picture of the subjects, the descriptive method was used. Quantitative (numerical) and qualitative (descriptive) data collection and analysis were involved.

### **2.2. Respondents of the Study**

The respondents were the 30 senior high school students in the HUMMS track, one of the classes of the researcher and 6 Senior High School teachers teaching Oral Communication in Tabaco National High School. Only 30 students were chosen as respondents because some are irregular in attendance and do not have access to internet in their homes.

### **2.3. Research Instrument**

For the research instruments, a survey questionnaire was utilized to determine the factors along phonology that affect the oral communication skills of students. The Likert Scale was used and interpreted as follows: 5 (4.21 – 5.00) Very Evident, 4 (3.41 – 4.20) Evident, 3 (2.61 – 3.40) Fairly Evident, 2(1.81 – 2.60) Less Evident and 1(1.00 – 1.80) Least Evident.

Another survey questionnaire was used to determine the level of effectiveness of the Digital Micro-teaching Approach. The Likert Scale was likewise used and interpreted as follows: 5 (4.21 – 5.00) Very Effective, 4 (3.41 – 4.20) Effective, 3 (2.61 – 3.40) Fairly Effective, 2(1.81 – 2.60) Less Effective and 1(1.00 – 1.80) Least Effective. Another instrument to assess the effectiveness of the approach, was a speech delivered by the students and rated through a rubric. The students were made to deliver a speech which focused on the essentials of phonology and rated by the researcher.

### **2.4. Statistical Treatment**

This study used several statistical tools. The mean or average was used to derive the central tendency of the data in question. It was determined by adding all the data points in a population and then dividing the total by the number of points. This was used to determine the average of the factors affecting phonological skills of learners and the level of effectiveness of digital microteaching in enhancing the retention of the concepts in phonology. Another tool used was the weighted mean which is an average in which each quantity to be averaged is assigned a weight, and these weightings determined the relative importance of each quantity on the average. In addition, frequency which can determine the number of times a score occurs, or the frequency of its occurrence, was used in this study to compute the number of times the respondents preferred the factors affecting students' skill in phonology and the items along effectiveness of the innovation. Percentage was also used to compare the scores or performance of the student respondents in the speech delivered after the conduct of the innovation.

### 3. Results and Discussion

#### 3.1. Factors Affecting Phonology as Perceived by Student Respondents

The first problem given light in this study was the factors that affect the retention of phonological skills as perceived by student respondents shown in Table 1.

**Table 1** Factors Affecting Phonology as Perceived by Student Respondents (Ability to Distinguish and Create the Sounds of Language)

Indicators	Weighted Mean	Description
1. Insufficient knowledge /mastery of the sounds/pronunciation/articulation of language	2.6	Less Evident
2. Lacks confidence about pronunciation of words, critical sounds clearly and the other elements of utterance	5.0	Very Evident
3. Mother tongue affects the articulation of the English language	4.0	Evident
4. Inadequate models/tools/drills for practice	4.6	Very Evident
5. Lacks self-confidence in articulating the English language	4.0	Evident
General Weighted Mean	4.05	Evident
5 (4.21 – 5.00) Very Evident 3 (2.61 – 3.40) Fairly Evident 1 (1.00 – 1.80) Least Evident 4 (3.41 – 4.20) Evident 2 (1.81 – 2.60) Less Evident		

Table 1 implies there were five factors identified to have affected the retention of phonological skills of the student respondents. The general weighted mean is 4.05 described as Evident. Of the five factors, *Inadequate models/tools/drills for practice* had the highest weighted mean of 3.80 described as Evident. This data showed that student respondents are in need of more models of performance and drills for them to be able to master phonology. Without adequate opportunities for practice, mastering phonology is difficult. Explicit instruction is what they need to develop mastery. Torgesen (2004)<sup>1</sup>, described explicit instruction as “instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own.” Moreover, Rosenshine (1987)<sup>2</sup> described explicit instruction as “a systematic method of teaching with emphasis on proceeding in small steps. In the Social Learning Theory of Communication introduced by Albert Bandura, he posited that individuals acquire and refine their communication abilities through observation, imitation, and modeling of others. Furthermore, people learn how to communicate by observing those in the immediate environment, as well as through media representations.

To respond to this difficulty, teachers should provide adequate drills as models. Since mastery of phonological skills require oral examples, it would be better to give recorded lessons by the teachers or a model speaker. This way, students can play the models again and again for mastery of phonology.

#### 3.2. Factors Affecting Phonology as Perceived by Teacher Respondents

The point of view of six teachers who are teaching Oral Communication was also sought along the factors that affect the phonological skills of students. The result shows in Table 2.

**Table 2** Factors Affecting Phonology as Perceived by Teacher Respondents

Indicators	Weighted mean	Description
1 Insufficient knowledge /mastery of the sounds/pronunciation/articulation of language	3.8	Less Evident
2 Lacks confidence about pronunciation the words, critical sounds clearly and the other elements of utterance	5.0	Very Evident
3 Mother tongue affects the articulation of the English language	3.4	Evident
4 Inadequate models/tools/drills for practice	4.6	Very Evident
5 Lacks self-confidence in articulating the English language	4.0	Evident
6 General Weighted Mean	4.16	Evident
5(4.21 – 5.00) Very Evident 3 (2.61 – 3.40) Fairly Evident 1 (1.00 – 1.80) Least Evident 4 (3.41 – 4.20) Evident 2 (1.81 - 2.60) Less Evident		

Table 2 means that of the six teacher respondents who are teaching Oral Communication a rating of 5 or Very Evident, was given to the factor *Lacks confidence about pronunciation of words, critical sounds clearly and the other elements of utterance*. With this observation, students do not give positive response to the lesson which leads to students avoiding speaking thus, hindering their communication skills. Students who lack confidence in their pronunciation become hesitant to speak in class or engage in conversations, fearing judgment or ridicule. Furthermore, inability to pronounce words correctly can negatively impact academic performance, especially in subjects requiring oral communication, and eventually limits future opportunities in fields where strong English skills are crucial.

On this, teachers should give interventions aimed at developing self-confidence that can have a positive impact on English language proficiency. For example, providing students with opportunities to practice speaking in English in a supportive and non-judgmental environment can help to build their self-confidence and improve their language skills. Other interventions, such as cognitive-behavioral therapy and self-efficacy training have also shown to be effective in building self-confidence of English language learners (Bandura, 1997)<sup>3</sup>. Specifically on phonology, the International Language Center (2024) in the article *Importance of Confidence in Conversational English*, gave suggestions such as teacher modelling pronunciation and practice pronouncing words and sounds that are often tricky for non-native speakers. By imitating native speakers, pronunciation can be improved. Also, the use of Language Learning Apps that focus on improving speaking skills will be a big help. With almost all students having cellphones or gadgets this time, this is definitely possible. Furthermore, the use of voice messages about phonology drills by the teacher for modelling and by the students for an output is an easy and accessible way of improving phonological skills of students.

### 3.3. Level of Effectiveness of Digital Micro-Teaching Approach in Teaching Phonology

This presents the level of effectiveness of digital micro-teaching approach in the mastery of phonological skills of Senior High School students of Tabaco National High School as shown in Table 3. Considering the different factors affecting the phonological skills as perceived by both students and teachers in Senior High School, this research focused on the use of digital micro-teaching as an approach that considered the learning preference of the students.

**Table 3** Effectiveness of Digital Micro-Teaching Approach in the Retentivity of Phonological Skills of Students

Indicators	Weighted Mean	Description
<b>Usefulness of the Digital Micro-teaching Approach Knowledge retention and application of phonetic skills</b>	<b>5.0</b>	<b>Very Effective</b>
Learner engagement in on-line learning	4.6	Very Effective
Achievement of skills in phonology	4.6	Very Effective
Alignment with Cognitive Load Theory (breaking down content to prevent mental exhaustion and improve understanding)	4.2	Effective
Use of the principle of spaced repetition	3.4	Effective
<b>2. Accessibility and flexibility of the digital micro-teaching materials Availability in various formats (video, audio, power point presentations)</b>	<b>4.6</b>	<b>Very Effective</b>
Fitness into the learners' workflow and personal schedule	4.6	Very Effective
Accessibility on mobile devices	5.0	Very Effective
<b>Relevance of the materials</b>		
Motivation to learn more	4.3	Very Effective
Suitability to the needs of student learning	4.4	Very Effective
General Weighted Mean	4.47	Very Effective
5 (4.21 – 5:00) Very Effective 4 (3.41 – 4.20) Effective 3 (2.61 – 3.40) Fairly Effective 2 (1.81 - 2.60) Less Effective 1 (1.00 – 1.80) Least Effective		

Table 3 implies that to determine the level of effectiveness of micro-teaching approach in improving the phonological skills of the student respondents, a survey questionnaire was answered. As shown in the table above, the approach was rated Very Effective (4.47) in the three aspects: Usefulness of the digital micro-teaching materials, Accessibility and flexibility of the micro-teaching materials and Relevance of the materials. Of the five indicators under *Usefulness of the Digital Micro-teaching Approach*, the approach was very effective in knowledge retention and application of phonetic skills, in the engagement in on-line learning and in the achievement of skills in phonology. By focusing on one concept at a time in short, bite-sized sessions, learners retain information better than in long-form training. As described by psychologist Hermann Ebbinghaus, in his Forgetting Curve theory, memory of new information is quickly lost unless it is actively reinforced. The bite-sized structured learning is a preferred self-paced approach (Tan,2024)<sup>4</sup>.

#### 4. Characteristics of Digital Microteaching Approach in Developing the Phonological Skills of Students

Today's learners are often characterized as digital natives, multitaskers, and self-directed, seeking instant gratification and social learning experiences, while also being mobile-ready and possessing shorter attention spans. This is particularly true for senior high school students in Tabaco National High School. The researcher, as one of the teachers in Oral Communication has observed that students tend to forget their lessons easily and have difficulties in mastering the skills particularly along phonology. There are factors that hinder students' mastery of these skills as perceived by them and by the teachers of Oral Communication.

The researcher conceptualized the innovation dubbed as Digital Micro teaching in Enhancing the Retentivity of Students in Phonology as an augmentation of the lesson. The materials are short, focused lessons in phonology -- critical vowel sounds, critical consonant sounds, word and sentences stress and phrasing. The materials were in video, power point presentations, voice messages which were provided to the learners every after each lesson. These were posted in the Class Group Chat. The following are the characteristics:

- Flexibility and Accessibility - Content is accessible anytime, anywhere, ideally on mobile devices, allowing learners to view and practice the sound production and reading into their busy schedules. Since students' buddies are their cellphones, it will be very convenient for them to listen to the recordings for as many times they wish until they have mastered the phonology lessons.
- Learner-Centered - The activities require learners to take a proactive role in their education, managing their time and learning independently. It also suits the interest and the characteristics of the Generation Z. Students' needs, goals, interests, and learning styles are also responded to by this approach. Also, the teacher's role here is to guide, facilitate, and provide resources, rather than solely delivering information.
- Personalized Learning - Online platforms can offer opportunities for customization and personalization, allowing learners to tailor their learning experience to their individual needs. It is tailored to the student's individual needs, interests, and abilities, going beyond a traditional "one-size-fits-all" model because this approach adjusts the pace, curriculum, and learning environment.
- Brevity/Bite-sized Content - The learning activities are short, often lasting only a few minutes, and are designed to be easily consumed without causing cognitive overload. This lessens the state of mental exhaustion that occurs when learners are faced with an excessive amount of information or demands that exceed the capacity of their working memory. These chunks of lessons given as interventions solve the information overload which can hinder their ability to understand and retain information effectively, making it difficult to transfer knowledge to their long-term memory.
- Content Focused- Each learning unit addresses one specific, narrow topic or objective, providing focused and essential information rather than broad overviews. The content posted in the Group Chat is a follow up of the lesson on phonology in order for the students to practice in the production of sounds, stress of words, phrasing or intonation in sentences.
- Variety of Formats - The lessons or activities are delivered in many formats, including short videos, power point presentations, infographics, interactive activities, or voiced messages. The variations will break the monotony of using the same format. Students who belong to the generation Z favor short, visual, interactive, and technologically integrated lesson formats, preferring platforms like YouTube and social media for learning. They value variety and flexibility, readily adapting to online and e-learning environments. This digitally-native generation prefer and become more engaged with shorter content chunks and practical, real-world lessons.
- High Engagement - The Generation Z are known to be engaged with lessons of short duration making it more appealing than longer, traditional learning formats. Lopez (2023)<sup>5</sup>, stated that Generation Z is independent and learner-centered with a short attention span.
- Practical and Performance-Oriented – Short lessons focus on practical application of phonological skills that lead to an immediate performance change since exercises are seen, heard, and produced by learners a number of times that would lead to a better performance in speech delivery.

---

## 5. Instructional Materials to Support the Enhancement of Retentivity of Students in Phonology

The researcher has prepared instructional materials to enhance the phonological skills of his students. The digital micro-teaching materials were along the production of critical vowel and consonant sounds, word and sentences stress, and phrasing. After the lesson inside the classroom, the drills were posted one at a time in the Class Group Chat in power point presentation, voice recordings, and videos in some cases. Students were made to listen and view the drills, practice reading them correctly. After a series of practice, they recorded their output through a voice message and post the output in the Messenger GC. The teacher/researcher listened and checked the posted voice message.

To help teachers on the materials which can be made into videos, voice recordings or power point presentations, enhancement materials in phonology were provided. The sample drills on phonology which focused on critical vowel and consonant sounds were classified into words containing the vowel or consonant sounds, phrases and sentences. Tongue twisters were also given for practice. Furthermore, drills were also provided on Word Stress (two-syllable words, compound words, compound nouns, compound verbs, intensive-reflexive pronouns, words used both as noun and verb) which means the emphasis placed on a specific syllable in a word, making it sound louder, longer, and higher in pitch than surrounding syllables. It is a crucial feature in English for ensuring intelligibility, distinguishing between words, and identifying grammatical functions.

There were also drills for Sentence Stress which refers to the emphasis placed on specific words within a sentence, making them louder, longer, and higher in pitch to highlight key information and create natural rhythm. It distinguishes between content words (nouns, main verbs) that carry meaning and structure words (prepositions, articles) that are usually unstressed, aiding in communication and meaning clarification.

To improve phrasing in reading which refers to grouping words into natural, meaningful chunks (phrases) instead of reading word-by-word practice exercises were likewise provided. For the application of phonological skills, sample poem (Invictus) and sample speeches – End of the School Year Message of Secretary Sonny Angara, March 24, 2025 and transcript of the commencement speech delivered by Senator Miriam Defensor Santiago, (University of the Philippines Los Baños, 27 April 2016) were part of the materials offered.

These sample drills will be helpful when made into digital, bite sized instructional materials, and used setting the procedure done by the researcher.

---

## 6. Implications/Insights

In line with the decline of oral communication skills among students and lack of interest in learning about them, as an educator, it is important to identify the factors that affect the oral communication skills of students especially along phonology which is about speech sounds that constitute the fundamental components of a language.

In this study, the researcher had chosen to conduct a survey on the factors that affect the retentivity of phonological skills in one of his classes of senior high school students. A digital micro-teaching approach was applied to them after it was proven that there were several factors hindering mastery in the different aspects of phonology.

It was proven in this research that with the application of Digital Micro-teaching approach, the performance of students in speech delivery improved significantly. It is indeed a challenge in addressing the needs of the students, especially in the senior high school on how to develop their oral communication skills using the accessible online platforms that they already have at home. Since they belong to Generation Z or digital natives they prefer technology-driven, interactive, and visual learning which require immediate feedback and real-world relevance. They value authentic learning, autonomy and collaboration. Diverse, globally connected sources and learning in short bursts are their preference in learning. That is why, digital micro-teaching made them enjoy and engaged in learning the phonology skills. Group Chats have indeed been very useful as a collaborative way in learning.

The innovation also runs parallel with the thrusts of the Department of Education to digitize education, which includes initiatives like the DEPED DigEd 2028 program aimed at interconnecting offices and schools, providing e-textbooks, and modernizing assessment systems. Digital teaching platforms like DepEd Commons, the Learning Resources Portal, and the Digital Learning Management System (DLMS) are being made available to provide online learning resources such as self-learning modules and video lessons. Teachers can access a wealth of online resources and collaborate with colleagues more easily, leading to the development of better teaching strategies and materials. This will also ensure the development of digital literacy and competence among teachers, a critical skill in the 21st century educational landscape.

It is also noticeable that suspension of face-to-face classes occur in increasing number due to natural calamities. On this, both the Commission on Higher Education (CHED) and the Department of Education (DepEd) have issued guidelines and orders (e.g., CHED CMO No. 4 s. 2020, DepEd Order 34 s. 2022) that allow and encourage the implementation of flexible and blended learning, providing an enabling environment for digital micro-teaching techniques.

These findings provide educators and instructional designers with valuable insights to create more effective and efficient learning materials tailored to learners' specific needs. Moreover, the study demonstrates a positive correlation between the integration of technology in educational settings and learner outcomes. Thus, educators should consider the integration of technology into their teaching and learning activities to foster improved learning and engagement. Overall, this study highlights the paramount significance of evidence-based instructional design practices in higher education. Educators and instructional designers are encouraged to embrace micro-teaching and technology as a means to optimize the learning experience of their students. Micro-teaching possesses transformative potential in educational approaches by offering flexible and personalized learning experiences that enhance knowledge retention and student engagement (McKee & Ntokos, 2022)<sup>6</sup>. As technology becomes increasingly accessible, the utilization of micro-learning in education is anticipated to witness rapid growth in the forthcoming years (Kuzminska et al., 2022)<sup>7</sup>. Educational institutions and instructors should incorporate micro-learning as one of their instructional strategies, while maintaining a balance with other pedagogical methods. This approach will facilitate the provision of a comprehensive and effective learning experience that responds to the diverse needs of students.

In summary, digital micro-teaching has a great potential for modernizing teacher education in the Philippines. However, issues related to infrastructure, access to internet connectivity and training for teachers must be addressed through strategic government intervention and support from the Department of Education itself. Thus, this innovation when

strengthened will be able to augment learning. It is then recommended that this approach be given importance and be replicated since its effectiveness has already been proven.

---

## 7. Conclusion

Based on the findings, the following conclusions are deduced:

- Students when given more drills and models on phonology attained a higher mastery in the articulation and delivery of the English language.
- The use of technology is beneficial for learning and developing the oral communication skills of students.
- Teaching is more engaging for everybody, making use of different approaches relevant to the needs and interests of learners.
- Practice makes perfect, and honing the self-confidence of students greatly help in improving the oral communication of students.

---

## Compliance with ethical standards

### *Acknowledgments*

With sincere affection and gratitude, the researcher would like to extend his heartfelt gratitude to the special people behind the completion of this study.

Atty, Dr, Antonio Z. Biglaen, the Tabaco College founder and chairman of the Board of Trustees for the constructive comments, suggestions, and encouragement;

Dr. Antonio B. Bueno, Dr. Julius B. Bertillo and Dr. Rebecca B. Baloloy for their generous suggestions, recommendations, and willingness to be part of this endeavor;

To the selected Grade 11 and 12 students and teachers of Tabaco College High School department for their participation, willingness, and cooperation during the demonstration teaching of the researcher;

To his friends and co-workers who extended help and moral support;

To his parents, Pa Ronaldo and Ma Dr. Jily L. Roces, who at the same time was his thesis adviser, for the love, unending support, understanding, guidance, expertise, encouragement and pieces of advice that helped him bring this study into success;

To the researcher's siblings, Kuya, Mac and Bunso for the push to go through and finish this study;

To his ever-supportive wife, Karren, for the endless love, push, and unending support to pursue and finish this study;

To his children, Kuya Miel, Kuya Arky, Coco and Baby Riri, his inspirations, this is for them.

And above all else, to Almighty God, the greatest provider of the gift of love and courage to finish the task at hand in accomplishing a milestone long cherished.

### *Disclosure of conflict of interest*

I declare that I have no conflicts of interest related to this research. I have no personal or financial relationships that could influence my work.

### *Statement of informed consent*

"Informed consent was obtained from all individual participants included in the study."

## References

- [1] Torgesen, J.K. (2004). Lessons learned from research on interventions for students who have difficulty learning to read. In P. McCardle & V. Chhabra (Eds.), *The voice of evidence in reading research* (pg. 355-382). Baltimore, Brookes.
- [2] Rosenshine, B. (1987). Explicit teaching and teacher training. *Journal of Teacher Education*, 38(3), 34-36 - Yahoo Search Results. (n.d). <https://ph.search.yahoo.com/search?fr=mcafee&type=E210PH714G0&p=Rosenshine%2C+B.+%281987%29.+Explicit+teaching+and+teacher+training.+Journal+of+Teacher+Education%2C+38%283%29%2C+34-36>
- [3] Bandura, A. (1997). *Self-efficacy: The exercise of control* (Vol. 11). Freeman
- [4] Tan, X. R., Lee, A. T., Harve, K. S., & Leung, B. P. L. (2024). Bite-sized structured learning: a preferred self-paced approach that enhanced learning of muscle physiology for allied health students. *AJP Advances in Physiology Education*, 49(1), 96–104. <https://doi.org/10.1152/advan.00157.2024>.
- [5] Lopez, E. N. B., Lopez, B., & Abadiano, M. (2023). *Understanding Generation Z, The New Generation of Learners: A Technological-Motivational-Learning Theory*. ResearchGate. [https://www.researchgate.net/publication/375328954\\_Understanding\\_Generation\\_ZThe\\_New\\_Generation\\_of\\_Learners\\_A\\_Technological-Motivational-Learning\\_Theory](https://www.researchgate.net/publication/375328954_Understanding_Generation_ZThe_New_Generation_of_Learners_A_Technological-Motivational-Learning_Theory)
- [6] McKee, C., & Ntokos, K. (2022). Online microlearning and student engagement in computer games higher education. *Research in Learning Technology*, 30.
- [7] Kuzminska, O., Morze, N., Smyrnova-Trybulska, E. (2022). *Microlearning as an Educational Technology: Information Requests and Bibliometric Analysis*