

 Research Article

Exploring Students' Perceptions of the Impact of Computer Multimedia on Their Teachers' Motivation

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Abstract

Educational media is launched, and it means all the tools used to make the teaching and learning process successful, from audible speeches and written texts, and all visuals from drawings, data, still and moving images. In general, it is called everything that can act as a mediator between a teacher and a learner, or represents a cognitive outlet to pass a message or educational content. The most important development issues that form the basis of the progress of societies and their ability to face the many and accelerating challenges they face are preparing teachers and increasing and enhancing their motivation towards education in a manner that is consistent with the requirements of the current era. The challenges facing the world's societies are large and multiple, and it is difficult to predict their size and the extent of their impact. They are characterized by being deeper and more complex, so we must keep pace with current global developments by preparing an individual capable of creativity and development. Motivating teachers increases the performance of their duties and helps teachers discover the educational difficulties facing students and the ability to control, overcome and address them. Therefore, this study aimed to explore the relationship between the motivation of mathematics teachers through computer multimedia and students' perceptions. To collect quantitative and qualitative data to know students' perceptions of teachers' motivation, the researcher conducted a questionnaire that included 12 mathematics teachers and 407 randomly selected students. The researcher used the Likert scale in his study, and to collect and analyze the data, the descriptive approach was used, and the SPSS program was adopted to analyze the results and hypotheses. The results showed that computer multimedia increases mathematics teachers' motivation according to students' perceptions.

Keywords: Computer Multimedia, Students' Perceptions, Teacher Motivation

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1. INTRODUCTION

The goal of motivating teachers is to push them to develop their skills, improve their performance, work to find new and innovative ways to deliver information to students, and encourage them to acquire new skills and sciences to prepare them and enable them to make conceptual change, access new concepts, link them to daily life, and benefit from them (Aldahdouh et al., 2020). The goal of teachers' motivation towards education can be divided into three goals, which are (Aljawarneh, 2020) Stimulating behavior: Motivation is the main path that motivates and motivates the teacher to teach and make an effort to acquaint students and introduce them to new concepts, and raise them to higher, prestigious, and positive levels in the field of science and learning. The level of motivation must be moderate because a low level leads to boredom and lack of interest, while a high level of motivation in the teacher may lead to increased stress and anxiety in him, as motivation towards education is the main driver and motivation for learning and searching for what is new in the educational environment. Guidance: Motivation aims to make the teacher compare the current educational environment with the goal he aspires to achieve, which is to improve and advance science, direct the students' path towards familiarity with new information and concepts, and direct his behavior and attention towards interest in science and education and performing various activities,

analyzing and processing them, in order to make the process Education is a fun and exciting process that the student seeks to engage in with all his (willAlotaibi, 2019) Continuity: Motivation aims to continue and attract the teacher's attention towards teaching, learning about and acquiring new information and concepts, and searching for and discovering everything that is new. Factors of low teacher motivation: One of the reasons for low teacher motivation and weak academic competence is generally represented by low morale (Amin et al., 2020). Which can be attributed to the following reasons: Lack of opportunities for career advancement, and this includes three basic things: experiences, as teachers' professional motivation is affected by the school experiences they have, which has an impact on their professional skills and their choice of the profession in which they will work, and professional growth, which represents the extent to which they benefit from teachers from the situations they may encounter, which may lead to reshaping their development in terms of knowledge and skills so that they become competent and knowledgeable, and advancement is the acknowledgment that teachers are at an appropriate level of competence to undertake more difficult tasks and assume more complex responsibilities (Ansari et al., 2020), and in the absence of one of these matters, teachers are incompetent, which reduces their motivation towards education (Awidi et al., 2019) The teaching load, which includes the weak level of students' achievement, their lack of interest and dependence on the teacher in all aspects, teachers' exposure to pressure from students and their families regarding their grades, the inappropriateness of some teachers' specialization for the curricula they teach, and the classrooms being devoid of the necessary equipment and devices (Bardakci, 2019). The work environment, as teachers' motivation is affected by the work environment and the personal and social factors it entails within the school environment, including the classroom environment, social and economic conditions, student behavior, exam stress, rewards and incentives (Barton et al., 2021), self-confidence, and the teacher's personality. Lack of incentives, which includes low salaries and wages and the lack or absence of incentives. This also includes the lack of equipment that teachers may need for teaching, and weakness in coordination between teachers (Bergdahl et al., 2020). Previous studies, Motivation is defined in the educational field as a state of internal arousal that moves the learner to exploit his maximum energy to reach the goal or goal in the educational situation (Chen et al., 2015). Another definition states that learning motivation is the desire that drives a person to succeed and achieve a certain educational level or gain social acceptance from parents and teachers, which motivates the learner and drives him to achieve the greatest possible level of performance (Dewi, 2024). We conclude from this that motivation is one of the most important factors stimulating learning and the desired academic achievement (Ellahi, 2018).

High productivity and outstanding performance cannot be achieved in the absence of work motivation and desire for achievement (Faizi, 2018) To talk about the impact that education motivation has, as educators we find that it deepens the student's or learner's connection with the educational material and enhances his benefit from it on the mental, emotional, and behavioral levels (Feyzi Behnagh et al., 2020) Sustaining motivation towards learning constitutes a major challenge that educators constantly face. What are the ways that help teachers cultivate and sustain motivation? Highlighting the future value, which means informing the learner what she will be able to do after her studies (Gazibara et al., 2020) Also, the effectiveness of using stimulating methods when starting the class or introducing previous experience such as storytelling, brainstorming questions, and exciting practical demonstrations cannot be ignored (Jogezai et al., 2021) The requirements of the era that is called the era of digital transformation and the era of the Fourth Industrial Revolution require you to be a technical teacher and to change the teaching tools to enable the teacher to deal professionally and professionally with his students who belong to the generation of deep-rooted electronic culture and who aspire to transform their hobbies into future professions, as we note that it has begun New titles for businesses and professions are spreading, there are YouTuber, food stylist, content creator, graphic designer and many others. In order for a teacher to deserve the title of leadership teacher, it is desirable that he be a thinker, innovative, and creative and be able to address the stagnation of the traditional book (Kasperski et al., 2020). One of the innovative solutions that can be followed during the class is to use various digital means and integrate them into the stages of the lesson. Instead of starting the class with an oral introduction, why not play a video clip from YouTube that is appropriate to the contents of the lesson. After completing the viewing, the teacher asks discussion questions based on what was watched. Applying this method ensures the stimulation of motivation and support for more than one type of learner (visual and auditory), and thus eager students who are more attuned to the educational content presented by the teacher (Hennink et al., 2017).

Another promising digital solution is the use of an interactive platform that keeps the teacher and students in continuous digital communication even outside the school walls (Masood, 2020) Examples of

these platforms are the Showbie and Nearpod programs, which allow the teacher to create virtual classes, adopt the flipped classroom strategy, and enrich the student community with different digital media, whether audio or visual, where the teacher can send files and video clips and create multiple tasks for students to perform (Manca, 2020)

The teacher's use of Augmented Reality applications is evidence of the teacher's familiarity with the latest technological developments and decisive evidence of your enthusiasm to impress your students and your interest in adding fun and excitement to the scientific content you provide. Example, Hollo Go app. This creative application, one of many virtual reality applications, transforms the classroom into what resembles a giant telescope that transports all members of the class to different parts of the world. The teacher, regardless of his teaching subject, can benefit from the Hollo Go application, as its main interface is a comprehensive library (Melati, 2024). This library has branches for various academic subjects. For example, a geography teacher can take students on a trip to any world capital of his choice and walk his class among various ancient monuments or modern buildings (Molla-Esparza et al., 2020). In addition, the science teacher can choose a biology course and explore with the students inside the human body and examine the heart or spinal cord with lifelike 3D models. What is unique about this application is that there is no need to use additional tools such as cards or models. The application is integrated in that it mixes the classroom environment with the required models and embodies them virtually. One of the best sites to create a digital quiz or quiz in class is Kahoot. The advantages of this program are the ease of use, the clarity of the instructions, and the wonderful competitive experience it creates within the classroom, which will achieve the lesson objectives in an interesting and enriching way, in addition to raising the level of classroom motivation. The teacher's use of this application ensures the participation of all students in the class, even the inactive ones, because Kahoot combines education and entertainment, and this is the trend that is called pedagogically, gamification, that is, creating an educational environment in an entertaining, exciting, and competitive framework (Aldahdouh et al., 2020). Use Kahoot for lesson closure activities and in review sessions prior to semester exams (Aldahdouh et al., 2020). In all cases and circumstances, the whiteboard and its pens are indispensable for the teacher. However, since we are talking about stimulating motivation and generating a passion for learning and knowledge in our students, we mention a digital program that mimics the whiteboard but in a more impressive and distinctive way. The program is called Video scribe, and it allows the user to design all types of animation to produce professional animation with high flexibility and ease of use. The application allows the user to insert images, sounds, and various multimedia objects and control them as visual and audio effects to add a communicative feature to the produced video. An example of this is making a creative and attractive handwriting video. There are various factors that can influence teacher motivation, both from outside and within higher education educational settings, starting with their motivation to pursue a career in teaching and continuing through their motivation while teaching. There are factors that contribute to motivating teachers throughout their teaching career and work for sustainability (Manca, 2020) This study aimed to answer the following questions: How does computer multimedia affect teachers' motivation, which can affect teachers' motivation? Study hypothesis: There is no statistically significant role for computer multimedia in achieving teachers' teaching motivation at a significant level $\alpha = 0.5$.

The results of the study are determined by the following aspects: Human limits: This study was limited to public school teachers in the capital, Amman. Spatial boundaries: public schools in the capital, Amman. Time limits: This study was conducted during the 2023 academic year.

2. METHODOLOGY

This part includes a presentation of the methodology used in the current study to achieve the two objectives of the study. It also includes an explanation of the study population and the sample and how they were chosen, in addition to the steps for building the tool and how its validity and stability were ensured and an explanation.

For application procedures and statistical processing used to analyze the study data according to its questions. Study Methodology: The study used the descriptive survey-analytical approach, by designing a questionnaire as a tool for the study, then collecting and displaying data using forms and tables. SPSS was also reviewed, organized, and classified, and it was analyzed using the statistical program Theoretical Literature and Scientific Research. References, Arabic and foreign literature and studies. The study

population and sample the study population consists of students (males and females) in public schools in the capital, Amman, who number (19,482) students distributed among (9) directorates and (792) schools, according to the Ministry of Education for the year 2023. A sample was taken randomly to represent the sample population. (518) questionnaires were distributed to students, and (407) were returned, bringing the number of the sample to (407) students, representing (78.6%).

Table 1. Survey for Students

	Items	Agree	Strongly Agree	Disagree	Strongly Disagree
1	You are a student who is enthusiastic about using computer multimedia to teach mathematics				
2	The teacher was enthusiastic about using computer multimedia in teaching mathematics				
3	The teacher was frustrated with the use of computer multimedia in teaching mathematics				
4	My motivations towards studying were positively influenced by my teachers' motivations.				
5	My motivation towards studying was negatively affected by my teachers' motivation.				
6	The teacher who was enthusiastic about using computer multimedia in teaching mathematics had a positive impact on my study of mathematics.				
7	The teacher's frustration with the use of computer multimedia in teaching mathematics negatively affected my study of mathematics.				
8	The teacher, who was enthusiastic about using computer multimedia in teaching mathematics had a positive impact on my attendance at the lesson.				
9	The teacher's frustration with using computer multimedia in teaching mathematics had a negative impact on my attendance.				
10	The impact of a teacher who is enthusiastic about using computer multimedia in teaching mathematics on the educational environment is positive.				

Data collection sources, to achieve the purpose of the current study, which aims to measure the degree of motivation among teachers working in the Ministry of Education, the researcher relied on two sources to collect data and achieve the objectives of the study, which are: Secondary sources: These are data obtained from library sources and literary reviews of relevant studies, in order to establish scientific foundations and a theoretical framework, such as: references and sources related to teachers' motivation, documents related to data and information related to the study, magazines. And peer-reviewed Arabic and foreign literature to cover the theoretical aspect, and information available on the Internet. Primary sources: These are the data obtained by collecting primary data using the study tool (questionnaire) as a main tool for measuring the study questions. The researcher prepared a questionnaire based on a Likert scale ranging from "strongly disagree" to "strongly agree." As a study tool to explore students' perceptions of the impact of computer multimedia on their teachers' motivation, the researcher distributed the questionnaire to 100 students, and the researcher conducted interviews with 12 participating teachers to identify the characteristics of teachers' motivation from the point of view of their students. Data was followed up and collected from the students by conducting regular interviews to identify commonalities in Motivation among teachers and students. Using objective analysis to identify external factors that affect teachers' motivation. The design of interview questions for teachers was built according to students' questionnaire answers. The Likert scale questionnaire for students consists of items listed as follows:

1. You are a student who is enthusiastic about using computer multimedia to teach mathematics
2. The teacher was enthusiastic about using computer multimedia in teaching mathematics
3. The teacher was frustrated with the use of computer multimedia in teaching mathematics
4. My motivations towards studying were positively influenced by my teachers' motivations.
5. My motivation towards studying was negatively affected by my teachers' motivation.
6. The teacher who was enthusiastic about using computer multimedia in teaching mathematics had a positive impact on my study of mathematics.

7. The teacher's frustration with the use of computer multimedia in teaching mathematics negatively affected my study of mathematics.
8. The teacher, who was enthusiastic about using computer multimedia in teaching mathematics, had a positive impact on my attendance at the lesson.
9. The teacher's frustration with using computer multimedia in teaching mathematics had a negative impact on my attendance.
10. The impact of a teacher who is enthusiastic about using computer multimedia in teaching mathematics on the educational environment is positive.
11. The effect of the frustrated teacher using computer multimedia in teaching mathematics on the educational environment is positive and negative.
12. The impact of a teacher who is enthusiastic about using computer multimedia in teaching mathematics on my academic achievement in mathematics is positive.
13. The effect of the frustrating teacher's use of computer multimedia in teaching mathematics on my academic achievement in mathematics is negative (see Table 1).

Table 2. Arithmetic Means, Standard Deviations, Ranks, and Degree of Motivation among Teachers in the Capital Governorate According to the Field of Incentives and According to the Responses of the Study Sample

	Items	Arithmetic Means	Standard Deviations	Ranks	Degree of Motivation
1	You are a student who is enthusiastic about using computer multimedia to teach mathematics	2.08	1.02	9	Low
2	The teacher was enthusiastic about using computer multimedia in teaching mathematics	2.73	1.06	8	High
3	The teacher was frustrated with the use of computer multimedia in teaching mathematics	2.92	1.04	5	Mid
4	My motivations towards studying were positively influenced by my teachers' motivations.	2.84	1.33	6	Mid
5	My motivation towards studying was negatively affected by my teachers' motivation.	1.74	0.99	11	Very Low
6	The teacher who was enthusiastic about using computer multimedia in teaching mathematics had a positive impact on my study of mathematics.	2.08	1.06	10	Low
7	The teacher's frustration with the use of computer multimedia in teaching mathematics negatively affected my study of mathematics.	4.07	1.01	1	High
8	The teacher, who was enthusiastic about using computer multimedia in teaching mathematics had a positive impact on my attendance at the lesson.	3.6	1.11	3	High
9	The teacher's frustration with using computer multimedia in teaching mathematics had a negative impact on my attendance.	3.61	1.11	2	High
10	The impact of a teacher who is enthusiastic about using computer multimedia in teaching mathematics on the educational environment is positive.	3.53	1.11	4	High
	Total	2.94	0.67	-	Mid

Each of the statements related to each paragraph of the study dimensions of the questionnaire was given grades to be treated statistically as follows: very high (5) grades, high (4) grades, average (3) grades, low (2) grades. D. Two points, very low (1) one point. In analyzing the data as follows: Five-Likert Scale The five-point Likert scale was used = (the upper limit of the scale (5) - the lower limit of the scale (1) / the number of categories (50.80, the length of the category, and then add the category length to the end of

each category. Validity of the study tool. Verifying the apparent validity of the study tool requires the assistance of an elite group of arbitrators composed of (5) members of the teaching staff who specialize in educational sciences. The opinions of the arbitrators were responded to, and the necessary deletions and amendments were made. Considering the proposals presented, the questionnaire was thus produced in its final form. Stability of the study tool. For verifying the stability of the study tool according to the responses to Cronbach's Alpha, the researcher applied the Cronbach's Alpha scale ($\alpha \geq 0.6$). After the process of collecting the necessary data and information about the study variables was completed, they were coded and entered the computer to extract the statistical results. Statistical methods were used within the Statistical Package for the Social Sciences program to process the data obtained through the study. Field study of the SPSS sample investigated. Specifically, the researcher used the following statistical methods: This is to test the extent of reliability of the data collection tool used in: the Cronbach Alpha test, measuring the variables included in the study. This is to know the distribution of the study sample on the demographic variables. Frequencies and percentages, descriptive statistics (arithmetic mean and standard deviation), to answer the first question to describe the opinions of the study sample. About the variables of the study and determining the importance of the statements contained in the questionnaire (see Table 2).

It is noted from the table above that the overall arithmetic means of the motivation score of teachers in the Capital Governorate through the field of incentives reached 2.94 (on a five-point Likert scale) with a standard deviation of (0.67) and is expressed as an average degree of motivation according to the responses of the study sample. (4.07), where paragraph (7) achieved the arithmetic means of the component paragraphs ranged between (1.74), with the highest arithmetic mean reaching (4.07), with a standard deviation of (1.01), and at a high degree of motivation, while paragraph (5) achieved The text had the lowest arithmetic mean of (1.74), with a standard letter (0.99), and at a very low degree of motivation according to the responses of the study sample.

3. RESULTS

The results in Table 2 showed through data analysis that the overall arithmetic mean of the degree of motivation among teachers in the Capital Governorate through the incentives field reached 2.94 (on a five-point Likert scale) with a standard deviation of (0.67) and is expressed as an average degree of motivation according to the responses of the study sample. (4.07), where paragraph (7) achieved arithmetic means for the component paragraphs ranging between (1.74), where its highest arithmetic mean was (4.07), with a standard deviation of (1.01), and at a high degree of motivation, while paragraph (5) achieved the lowest arithmetic mean (1.74), with a standard deviation of (0.99), and at a very low degree of motivation according to the responses of the study sample. It has been shown that the use of multimedia in education affects participation in learning. Multimedia has a major role in the learning process, presenting new information and developing students' skills.

4. DISCUSSION AND CONCLUSION

Multimedia is a powerful learning tool. Multimedia improves students' learning and provides educational success. Multimedia learning allows identifying student strengths and student weaknesses. Using multimedia as a powerful learning tool acts as a motivator and retainer of knowledge presented to students. Multimedia provides easy understanding of the ideas presented to students.

Discussion of the findings related to the first question: How does computer multimedia affect teachers' motivation, which may affect teachers' motivation? The results of the arithmetic averages showed that the degree of motivation among teachers in the Capital Governorate, field 7 achieved the highest average of 4.07, while field 5 achieved the lowest average and the arithmetic average is 1.74. The researcher also attributes the effectiveness of using multimedia in teaching. This result is consistent with the study (Barton, B.A, et al, 2021). which showed that the level of motivation towards schoolwork among science teachers was moderate. This result also agreed with Barton et al. (2021), which showed that the levels of professional motivation for electronic teaching among mathematics teachers in the Arab cultural environment were between medium and high, and showed that the level of motivation for achievement through e-learning among teachers was at an average level (Barton et al., 2021). Recommendations: The necessity of developing a specific system for applying multimedia in schools, The need to design systematic and precise plans to reduce the teaching burden on the teacher by applying multimedia in schools to increase

teachers' motivation, The need to hold training courses according to the teacher's needs on how to apply multimedia in schools. The need for those concerned to involve the teacher in designing and selecting multimedia curricula in schools. Which he studies, and his sense of importance when adopting his opinion increases his motivation. The researcher recommends the following: Teachers should be motivated to apply computer multimedia in learning. Train the teacher on how to deal with computer multimedia in education. The student should be informed about the objectives of using these media in education. The positive effects that computer multimedia play on education should be emphasized.

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REFERENCES

- Aldahdouh, T.Z., Nokelainen, P., & Korhonen, V. (2020). Technology and social media usage in higher education: The influence of individual innovativeness. *SAGE Open*, 10(1), p.2158244019899441. <http://dx.doi.org/10.1177/2158244019899441>
- Aljawarneh, S.A. (2020). Reviewing and exploring innovative ubiquitous learning tools in higher education. *Journal of Computing in Higher Education*, 32(1), 57-73. <https://doi.org/10.1007/s12528-019-09207-0>
- Alotaibi, N. B. (2019). Cyberbullying and the expected consequences on the student's academic achievement. *IEEE Access*, 7, 153417–153431. <https://doi.org/10.1109/ACCESS.2019.2947163>
- Amin, F.M., & Sundari, H. (2020). EFL students' preferences on digital platforms during emergency remote teaching: Video Conference, LMS, or Messenger Application? *Studies in English Language and Education*, 7(2), 362-378. <https://doi.org/10.24815/siele.v7i2.16929>
- Ansari, J. A., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments*, 7(1), 1-16. <https://doi.org/10.1186/s40561-020-00118-7>
- Awidi, I. T., Paynter, M., & Vujosevic, T. (2019). Facebook group in the learning design of a higher education course: An analysis of factors influencing positive learning experience for students. *Computers & Education*, 129, 106-121. <https://doi.org/10.1016/j.compedu.2018.10.018>
- Bardakci, S. (2019). Exploring high school students' educational use of YouTube. *International Review of Research in Open and Distributed Learning*, 20(2), 260–278. <https://doi.org/10.19173/irrodl.v20i2.4074>
- Barton, B.A, Adams, K.S., Arrastia-Chisholm, M.C., & Browne, B.L (2021) The effects of social media usage on attention, motivation, and academic performance. *Active Learning in Higher Education*, 22(1), 11–22. <https://doi.org/10.1177/1469787418782817>
- Bergdahl, N., Nouri, J., Fors, U., & Knutsson, O. (2020). Engagement, disengagement, and performance when learning with technologies in upper secondary school. *Computers & Education*, 149, 103783. <https://doi.org/10.1016/j.compedu.2019.103783>
- Chen, Y.- C. (2015). Linking learning styles and learning on mobile Facebook. *The International Review of Research in Open and Distributed Learning*, 16(2). <https://doi.org/10.19173/irrodl.v16i2.2038>
- Dewi, P. W. (2024). Online module: Bibliometric analysis (1998–2023). *Journal of Research in Mathematics, Science, and Technology Education*, 1(1), 47–61. <https://doi.org/10.70232/xa9mv566>
- Ellahi, A. (2018). Social networking sites as formal learning environments in business education. *Journal of Educational Technology & Society*, 21(4), 64-75.
- Faizi, R. (2018). Moroccan higher education students' and teachers' perceptions towards using web 2.0 technologies in language learning and teaching. *Knowledge Management & E-Learning*, 10(1), 86-96.
- Feyzi Behnagh, R., & Yasrebi, S. (2020). An examination of constructivist educational technologies: Key affordances and conditions. *British Journal of Educational Technology*, 51(6), 1907-1919.

- Gazibara, T., Cakic, J., Cakic, M., Grgurevic, A., & Pekmezovic, T. (2020). Searching for online health information instead of seeing a physician: A cross-sectional study among high school students in Belgrade, Serbia. *International Journal of Public Health*, 1–10. <https://link.springer.com/article/10.1007/s00038-020-01471-7>
- Hennink, M. M., Kaiser, B. N., & Marconi, V. C. (2017). Code saturation versus meaning saturation: how many interviews are enough? *Qualitative Health Research*, 27(4), 591-608.
- Jogezai, N. A., Baloch, F. A., Jaffar, M., Shah, T., Khilji, G. K., & Bashir, S. (2021). Teachers' attitudes towards social media (SM) use in online learning amid the COVID-19 pandemic: the effects of SM use by teachers and religious scholars during physical distancing. *Heliyon*, 7(4), e06781. <https://doi.org/10.1016/j.heliyon.2021.e06781>
- Kasperski, R., & Blau, I. (2020). Social capital in high schools: Teacher-student relationships within an online social network and their association with in-class interactions and learning. *Interactive Learning Environments*, 1–17. <https://doi.org/10.1080/10494820.2020.1815220>
- Manca, S. (2020) Snapping, pinning, liking or texting: Investigating social media in higher education beyond Facebook. *The Internet and Higher Education*, 44, 100707. <https://doi.org/10.1016/j.iheduc.2019.100707>
- Masood, A., Luqman, A., Feng, Y., & Ali, A. (2020). Adverse consequences of excessive social networking site use on academic performance: Explaining underlying mechanism from stress perspective. *Computers in Human Behavior*, 113, 106476. <https://doi.org/10.1016/j.chb.2020.106476>
- Melati, M., & Hadinugrahaningsih, T. (2024). The effect of numbered head together (NHT) in a flipped classroom environment on students' self-efficacy and achievement on colloid topics. *Journal of Research in Education and Pedagogy*, 1(1), 24-29. <https://doi.org/10.70232/c99bex94>
- Molla-Esparza, C., López-González, E., & Losilla, J. (2020). Sexting prevalence and socio-demographic correlates in Spanish secondary school students. *Sexuality Research and Social Policy*, 1–15. <https://doi.org/10.1007/s13178-020-00434-0>