International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

A Framework of Visual Effects in Digital Content to Foster Creative Thinking, Learning Readiness, and Student Performance in Schools

Maha Zuhair Ahmed Mohammad Abu Aladeeb and Dr. Mohammed Mai

Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak, Malaysia

DOI: 10.46609/IJSSER.2024.v09i10.028 URL: https://doi.org/10.46609/IJSSER.2024.v09i10.028

Received: 10 August 2024 / Accepted: 28 September 2024 / Published: 20 October 2024

ABSTRACT

Particularly in abstract sciences, elementary stage students sometimes struggle to grasp scientific topics. Thus, depending simply on conventional learning approaches would result in a lack of creative thinking in the learning process and a weak preparedness to continue in the study. This situation calls for alternative learning techniques including visual effects based on digital information. This paper aims to investigate the interactions among visual impacts in digital material, creative thinking, learning readiness, student performance. The correlations between visual effects in digital material, creative thinking, learning preparedness, and student performance were examined in this paper using quantitative approaches. The population consists of UAE's teaching personnel for elementary schools. Data tool is a self-administered questionnaire. 700 teachers in 248 Abu Dhabi schools is the sample used for the data collection. The survey process has followed a simple random sample method. Data analysis is done with SPSS program. Data analysis and hypothesis testing of this study have been done using SEM and regression analysis. The findings showed that visual impacts in digital material significantly influence creative thinking, learning readiness, and student performance as well as creative thinking and learning readiness have major effects on student performance. Thus, including visual effects into digital textbooks is a good way to enhance UAE students' learning process. Therefore, this study advises include visual impacts in education curriculum; while future studies in this subject should assist the policymakers in the ministry of education to control alternative learning approaches and develop new standards for this aim.

Keywords: Creative Thinking, Learning Readiness, Visual Effects in Digital content, Student Performance.

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

1. Introduction

The elementary school stage is regarded crucial for students' academic careers since it builds the groundwork for the subsequent advanced phases (Mustafa, 2014). During this stage, students not only learn basic academic skills such as reading, writing, and arithmetic but also develop important social and emotional skills. This is also the time when students begin to form their attitudes towards learning and education, which can greatly impact their future success. Therefore, it is essential for educators to create a nurturing and stimulating environment during the elementary school years to set students up for success in their academic journey. Students at this period often struggle to grasp scientific disciplines, particularly abstract sciences like mathematics and physics, because these lectures include unclear phrases and complicated concepts (Mihardi et al.,2022). As a result, focusing solely on traditional learning techniques will result in a lack of student motivation, a weak will to learn, and a lack of innovative thinking (Schoevers et al., 2019).

This environment necessitates alternate learning approaches, such as visual effects based on information technology and digital photography. For example, infographics have been shown to assist students improve their academic performance by incorporating visual impacts into study materials, motivating students to participate in the class with a desire and enjoyment of receiving knowledge (Wulandari et al., 2022). Visual impacts have long been seen as an integral element of the emotional human experience, serving as a method of expression, communication, exploration, imagination, culture, and historical understanding. As a result, the issue of visual impact integration should not be limited to a single field but rather span the whole curriculum (Jovita, 2018). Many academics have combined visual effects with various instructional approaches, whether traditional or technological. However, the research does not address the impact of visual effects with digital material on student performance in the United Arab Emirates (UAE). Therefore, further studies should be conducted to analyze the effects of incorporating visual elements in digital materials on student performance in the UAE.

By understanding how visual impact integration influences learning outcomes in this specific context, educators can better tailor their teaching methods to meet the needs of students in the region. This research will also contribute to the growing body of literature on the importance of visual elements in education and provide valuable insights for educators worldwide. There are few researches on this topic in the UAE educational system, and the function of learning readiness and creativity in encouraging student success is still a vacuum that instructors must fill. Although there have been numerous studies on teaching methods and how visual effects influence student performance, the development of their scientific cognitive ability, and overcoming the difficulties they face in acquiring abstract scientific concepts, there have been few studies on the impact of integrating visual effects with digital content in primary schools in

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

the context of other factors such as learning readiness and creative thinking. As a result, research attempts to fill this vacuum by providing actual evidence for the relevance of these linkages. Today's digital era cannot be understated. Visual effects are an essential component of digital material, whether it takes the shape of movies, animations, or interactive media (Liu et al., 2022). The findings will provide valuable insights into how to design and deliver educational content that maximizes learning outcomes through the lens of visual effects. As a result, this research can contribute to understanding this relationship in the primary school educational system and highlight the critical role that the visual effects curriculum plays in identifying what education needs to improve its programs in the future in light of new technology such as digital content.

2. Literature Review

2.1. Learning readiness

Readiness is a personal motivation that an individual's actions will lead to the achievement of his or her goals (Howard et al., 2021). Having a high level of readiness can greatly increase the likelihood of success in reaching one's goals. It involves being prepared to take action, having a clear plan in place, and being committed to following through despite any challenges that may arise. By cultivating a strong sense of readiness, individuals can overcome obstacles and stay focused on their desired outcomes. An individual anticipates three variables before beginning to apply the effort necessary to attain a given objective. These are the factors of influence, anticipation, and reward.

The power of persuasion originates from an individual's perception that good performance will result in a reward. In terms of expectancy, it implies that the individual believes that whatever valuable effort he or she makes will result in an acceptable outcome. The third aspect, reward, refers to an individual's appreciation for the benefit. And his understanding of its impact on meeting his or her fundamental requirements (Liu et al., 2020). Students' readiness to learn new information is critical to their success. A motivated student will be satisfied with his or her academic accomplishments (Kearney & Garfield, 2022). Motivation plays a key role in determining a student's willingness to engage in learning activities and persevere through challenges. When a student is driven by a belief in their ability to succeed and a desire for the rewards that come with academic achievement, they are more likely to put in the effort needed to excel. By fostering a supportive and encouraging environment that promotes a sense of accomplishment and recognition for hard work, educators can help students cultivate a strong sense of motivation and a passion for learning. Motivation helps students prepare for studies. Intrinsic motivation is inwardly oriented and driven by a student's innate enjoyment with accomplishing a task or learning a skill (Chung et al., 2020). While extrinsic motivation is frequently influenced by external incentives and punishments, Self-motivation is vital for kids

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

since it helps them. A strong feeling of self-motivation not only improves your pupils' academic performance. Self-motivation is a valuable life skill. It is essential for attaining objectives, feeling fulfilled, progressing in education, and enjoying better personal happiness. In brief, learning preparation improves cognitive processing (Jong, 2020). In addition, self-motivation also fosters independence and resilience in children, teaching them to persevere in the face of challenges and setbacks. It instills a sense of determination and drive that can lead to long-term success and fulfillment in both academic and personal endeavors. Ultimately, self-motivated individuals are more likely to take initiative, set goals, and work towards achieving them, setting them up for a lifetime of growth and achievement.

The willingness to study is impacted by the knowledge that should be obtained in school. In this regard, the teacher's involvement is critical during the learning process since students are more driven to study when they receive praise or a good reaction from their teachers, resulting in a high degree of learning readiness. The instructor who focuses on the approaches that drive pupils to learn determines which learning methods they favor and are happy to employ. If a pupil is offered an incentive in a short amount of time, they may be highly motivated to study. While diversifying learning techniques may have a detrimental impact on student achievement, incentives for students must be both diversified and numerous. The variety of incentives makes it more successful than utilizing a single form that may be uninteresting for the learner, is worthless, and does not lead to a positive change in behavior (Van Themaat, 2019). Therefore, it is crucial for instructors to not only understand the learning preferences of their students but also to provide a range of incentives to keep them motivated. By offering a variety of rewards, such as praise, extra credit, or small prizes, instructors can cater to the diverse needs and interests of their students. This approach not only increases student engagement and participation but also fosters a positive learning environment where students are eager to learn and succeed. Ultimately, by employing a combination of learning methods and incentives, instructors can effectively support student achievement and promote a culture of continuous learning and improvement.

2.2. Creative thinking

Creative thinking is a distinct mode of thinking that results in the development of useful and original ideas. Students' creative thinking includes learning how to produce new ideas and apply them in specific circumstances, understanding complicated events from a fresh perspective, identifying alternative explanations, and generating new connections that result in a beneficial conclusion. This includes merging pieces to create something new, sorting and refining ideas to identify possibilities, developing theories and objects, and practicing intuition. Creative thinking might take the form of sophisticated representations and visuals, digital and computer-generated outputs, or virtual reality experiences.

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

Some studies have found that creative thinking is influenced by a variety of factors, including whether the work is collaborative and how driven individuals are to solve an issue. These findings provide credence to the notion that flexible thinking underpins creativity (DeHaan, 2011). In the same vein, Schacter et al. (2006) found that classes where teachers encouraged creative thinking in pupils observed substantial gains in student academic performance. Concept creation is a mental process that allows us to compare, contrast, and categorize thoughts, objects, and events. Conceptual learning can be tangible or abstract, and it is strongly related to metacognition. What has been learned can be applied to subsequent examples. Everyone is capable of participating in creative thinking, such as addressing ordinary tasks in an unexpected manner. By facilitating the interpretation of experiences, actions, and events, creative thinking among students can have a favorable influence on their interest, academic achievement, identity, and social and emotional development (Schoevers et al., 2019).

Creative thinking allows individuals to think outside the box and come up with innovative solutions to problems. It encourages individuals to explore different perspectives and challenge traditional ways of thinking. By engaging in creative thinking, students can develop critical thinking skills and enhance their ability to analyze and evaluate information. Ultimately, fostering creative thinking among students can lead to a more dynamic and stimulating learning environment that promotes growth and development. Although knowledge and creative thinking are critical for academic and professional success, classroom teachers frequently give limited opportunity for children to think creatively (Tabieh et al., 2021). This lack of emphasis on creative thinking in the classroom can hinder students' ability to problem-solve and think outside the box. It is important for educators to incorporate activities and assignments that encourage creativity and innovation in order to fully prepare students for the challenges they will face in the future. By nurturing creative thinking skills, teachers can help students become more adaptable, resourceful, and successful individuals in both their academic and professional pursuits. However, creative thinking and problem solving may be included in instruction in a variety of ways.

Teachers, for example, might push students to seek out new connections between different concepts or urge them to propose many and diverse answers to challenging situations. If the capacity to be creative is actually important for pupils' future success, instructors must encourage and teach it in school. To that end, teaching pupils to think beyond the box is a helpful strategy to make kids creative. (Robinson 2001). Encouraging creativity in students not only helps them think critically and outside the box, but also fosters innovation and adaptability. By challenging students to come up with multiple solutions to problems, teachers are preparing them for the complexities of the real world. It is essential for educators to incorporate creative thinking into their lessons in order to help students thrive in an ever-changing and competitive environment.

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

Ultimately, teaching students to be creative will not only benefit their academic and professional success but also contribute to their personal growth and development.

2.3. Visual effect in digital content

Learning through visual stimuli is a complicated process in which the imagination and intellect assist pupils in establishing a new sense that improves their learning abilities. Many academics have underlined the need for implementing new educational techniques and models, such as employing technological approaches that promote inclusion and diversity, working with small groups, and utilizing applications and practical skills (Wang et al., 2021; Chung & Ko, 2023). These methods not only engage students more effectively but also cater to different learning styles, making education more accessible and inclusive for all. By incorporating these innovative strategies into the curriculum, educators can create a dynamic and interactive learning environment that fosters creativity, critical thinking, and problem-solving skills in students. Ultimately, the integration of visual stimuli and new educational techniques can lead to a more well-rounded and enriched learning experience for pupils of all backgrounds and abilities.

Visual effects boost learners' minds and thinking. It encourages him to think in other, unexpected ways. According to Enik (2013), visual effects give a mix of material and social facts, as well as extracting unique links between concepts and human experience, making digital information amazing instruments for students to learn complicated topics. There is a vital aspect, which is the link between the artist and the student, as is the case with today's technology and media. This connection allows for a more personalized and engaging learning experience, as students can interact with the material in a way that resonates with them. By incorporating visual effects into education, teachers can cater to different learning styles and help students better understand and retain information. Overall, the use of visual effects in education opens up a world of possibilities for both educators and students, enhancing the learning process and fostering a deeper understanding of complex subjects. We shall witness a significant link between art and innovative learning approaches that clarify topics for pupils (Chang, 2022).

This integration of art and technology in education not only enhances engagement but also promotes creativity and critical thinking skills. By utilizing visual effects, educators can create a more immersive and interactive learning environment that encourages students to explore, experiment, and problem solve in a way that traditional teaching methods may not allow. As we continue to embrace the power of visual effects in education, we can expect to see a positive impact on student achievement and academic success. According to a study of relevant research literature, visualizations have a favorable impact on students' behavior, inventiveness in involvement, and academic success. Researchers may disagree on the ideal approach to educating children to read and write, or to understand science, history, and arithmetic, but they

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

all agree that art education has a direct influence on kids' academic achievement. Researchers believe that the arts are an essential part of our lives, but they looked into whether this influence is crucial in schooling. As a result, visual impacts must be included in education legislation, and additional research in this area should assist policymakers in regulating alternative learning techniques and developing new rules for this purpose. This will ensure that all students have access to a well-rounded education that includes art education. By integrating visual arts into the curriculum, students can develop critical thinking skills, creative problem-solving abilities, and a deeper appreciation for the world around them. Ultimately, by recognizing the importance of art education, policymakers can help students succeed academically and creatively in school and beyond.

2.4. Student performance

Academic performance is a word used to describe a student's understanding of a topic based on their achievement test marks. Academic performance encompasses both affective and cognitive performance in a certain activity, whether intellectual or non-intellectual, and is frequently used to assess educational achievement and excellence (Okello et al., 2020). In addition to test results, factors like attendance, participation in class, and assignment completion can also affect academic performance. It is important for educators to consider all aspects of a student's academic performance in order to gain a comprehensive understanding of their abilities and areas for improvement. By analyzing academic performance, teachers can tailor their instruction to better meet the needs of each individual student and help them reach their full potential.

The ultimate purpose of every educational system is to expand students' knowledge, prepare them for the future, and turn them into active members of society. As a result, the educational system in all nations is concerned with student accomplishment, success rates in various topics, and how well students perform in different areas (Jadama, 2014). Therefore, it is crucial for teachers to continually evaluate student progress and provide feedback to guide their learning journey. By focusing on student achievement and growth, educators can ensure that each student is receiving the necessary support and resources to excel academically and become well-rounded individuals. Ultimately, the goal of education is to empower students to become confident, competent, and contributing members of society who can positively impact the world around them. It is critical to understand academic performance early on by assessing pupils' performance in childhood in order to establish an educational system that improves academic performance later on.

The significance of academic success is restricted to the grades that students receive, which allow them to continue studying and advance to higher levels of study. Many educators and professionals in educational and pedagogical circles see student performance as a fundamental

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

benchmark for determining the academic level of learners and students. The goal of studying academic performance is to gather knowledge, facts, attitudes, and dispositions that demonstrate the extent to which pupils understand what they have studied in the specified academic courses. Knowing students' strengths and weaknesses; identifying students' unique abilities in order to improve their learning capabilities (Abruzzi, 2016). There is no widespread agreement on how to assess academic performance or which procedural knowledge components, such as skills or declarative knowledge, are more important (Stajkovi et al., 2018). Some argue that standardized tests are the most effective way to measure academic performance, while others believe that a combination of assessments, including projects, presentations, and portfolios, provide a more comprehensive view of a student's abilities.

Regardless of the method used, it is important for educators to continually assess and analyze academic performance in order to tailor instruction to meet the needs of each individual student. By understanding where students excel and where they struggle, educators can provide targeted support and interventions to help students reach their full potential. Furthermore, there are individual characteristics that are associated with and impact the student's academic progress, providing incorrect measures of true academic performance. These elements include test anxiety, study environment, motivation to study, and emotions. (Broaddus et al. 2019). Individual disparities in academic success are strongly connected to differences in personality and intellect. Furthermore, students' self-efficacy, self-control, and motivation levels all have an impact on their academic success. Academic performance is frequently quantified using the Academic Performance Index.

To summarize, student performance is a measure of a student's educational accomplishment in scientific disciplines or obtaining a specific degree of competency in the study. In other words, student performance may be described as the end outcome of the learning process, and it can be quantified by particular tests or instructor observation. In the end, a combination of internal and external factors affects student performance. While some students may excel academically due to their innate abilities and strong motivation, others may struggle due to a lack of self-efficacy or external obstacles. The Academic Performance Index serves as a helpful tool in evaluating and comparing student performance, but it is important to remember that academic success is not solely determined by test scores or grades. It is a complex interplay of various factors that contribute to a student's overall educational achievement.

3. Research Methodology

This study adopted quantitative methodology to examine the relationships between visual effects in digital content, learning readiness, creative thinking, and student performance. The population of this study are the teaching staff in elementary schools. Data instrument is questionnaire. The

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

sample size consists of 700 teachers in 248 schools in the city of Abu Dhabi in UAE. Simple random sampling technique has been applied to collect data from the respondents. SEM have been deployed to conduct data analysis and test the hypothesis of this study.

4. Result and discussions

The demographic data is shown in Table 1, which shows that the majority of teachers are female (89.16%). Regarding the age, the largest percentage are teachers aged 31-40 years. Which teachers holding a bachelor's degree (58.92%), and a largest number, and those having an experience between 6-10 years (56.66%) are the majority.

Table 1. The demographic profiles of teachers

Description	Frequency	Percentage
Gender		
Male	592	89.16
Female	72	10.84
Age		
22 – 30 years	157	23.70
31-40 years old	336	50.56
41 – 50 years	121	18.28
51 years and older	49	7.45
Academic qualification		
Diploma	94	14.22
Bachelor	391	58.92
Master/Doctoral	178	26.86
Experience		
Less than five years	130	19.64
6-10 years	376	56.66
11-20 years	108	16.25
More than 20 years	49	7.45

To test the hypotheses, an analysis of the direct relationships with significant statistical significance between the visual effects of digital content, creative thinking, learning readiness,

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

and student performance. To ensure the validity of the hypotheses and their acceptance, standardized regression coefficients were compared to determine the intensity of the association with the above-mentioned variables, as well as the presence of significant statistical significance at the threshold of 0.05. To accept the hypotheses, the critical ratio (CR), which must be greater than 1.95, is compared to evaluate the statistical significance of the regression coefficients between variables (Hair et al., 2019). The following two criteria are used to validate the hypotheses: first if CR ≥ 1.96 is a direct relationship between two pairs of variables; Secondly, the statistical significance coefficient p-value is less than 0.05, then the hypothesis is supported, otherwise the hypothesis must be rejected. The result of hypothesis analysis is shown in Table 2.

Table 2. The significance and strength of relationships

Direction of effect	Beta	C.R	Sig.	Result
Visual Effects of Digital → Student Performance	0.4	5.53	0.00	Supported
Visual Effects of Digital Content → Creative Thinking	0.30	6.75	0.00	Supported
Visual Effects of Digital Content → Learning Readiness	0.31	6.56	0.00	Supported
Learning Readiness → Student Performance	0.51	6.55	0.00	Supported
Creative Thinking → Student Performance	0.34	4.92	0.00	Supported

As the relationship between the visual effects of digital content and student performance in primary schools in Ab Dhabi was statistically significant and the degree of correlation is moderate (C.R = 5.53, Sig. = 0.00 ≤ 0.05, beta = 0.40), the first hypothesis was accepted as shown in Table 2. This outcome emphasizes how crucial visual impacts are to improving the cognitive and emotional performance of the students. Consequently, it can be said that improving the cognitive and emotional performance of UAE primary school pupils depends critically on visual effects included into digital textbooks. The second hypothesis was approved since the degree of correlation between the visual effects of digital content and creative thinking in primary schools in Abu Dhabi was statistically significant and the value of beta = 0.30 indicates that creative thinking is much influenced by them. This outcome emphasizes how crucial visual impacts are for fostering in pupils innovative thinking. Development of creative thinking in primary schools depends much on visual impacts. Incorporating visually exciting components into the classroom helps students to develop their creativity by interactive learning and stimulate creative and new ideas. The third hypothesis was approved since the degree of correlation between the visual effects of digital content and creative thinking in main schools in Abu Dhabi was statistically significant and the degree of correlation is moderate (C.R = 6.56, Sig. = 0.00 ≤

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

0.05, beta = 0.31). This outcome emphasizes the need of visual impacts in increasing students' degree of desire for education. This outcome suggests that visual impacts have a great influence on inspiring children to study as, via digital textbooks, they help to build preparation for learning in elementary schools. These impacts improve student involvement and interest as well as help to improve material understanding and memory. The fourth hypothesis was approved since the degree of correlation between learning readiness and student performance in primary schools in Abu Dhabi was statistically significant and the degree of correlation is moderate (C.R = 6.55, Sig. = 0.00 ≤ 0.05, beta = 0.51). This outcome shows the student's aptitude to learn and his capacity to actively engage in the learning process, which will eventually help to raise his academic achievement. It covers several elements, including emotional and cognitive preparation, all of which significantly influence the path of the student in school. These elements can have a big influence on how well a student does academically and generally in their school. Studies on the same subject have shown comparable findings: pupils who are more ready to learn typically exhibit better degrees of motivation, concentration, and study participation. Given the relationship between creative thinking and student performance in primary schools in Abu Dhabi was statistically significant and the degree of correlation is moderate (C.R = 4.92, Sig. = 0.00 ≤ 0.05, beta = 0.34), the fifth hypothesis was approved. It has been demonstrated that students' success in UAE's main schools is much influenced by their creative ability. Other studies have found that helping kids to develop creative thinking would help them to perform better cognitively. Consistent with the outcomes of this study, a guidance program focused on creative thinking processes helps academically talented tenth grade students strengthen their career planning skills. Encouragement of students to think creatively and in numerous ways and investigate several answers to issues not only helps them to improve their creative thinking ability but also increases their motivation in their education. This kind of thinking lets students approach chores from a fresh angle, which generates creative ideas and a better knowledge of the issue. Furthermore, innovative thinking encourages pupils' collaboration.

5. Conclusions

This study comes to the conclusion that using visual effects on digital textbooks is one approach to help students in UAE's underperformance in main schools. Including interactive components and visual images into digital materials helps pupils improve their abilities for creative thinking and focus and memory recall. Furthermore, visual effects in digital textbooks can offer a more customized learning experience by accommodating diverse learning environments and ability. Furthermore, improving student cooperation is the usage of digital textbooks. By use of tools like online forums and virtual group projects, students may engage actively and grow in tandem. This motivates pupils to take ownership of their education and fosters collaboration. Stated differently, digital content augmented with visual effects promotes creativity in education and

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

helps to inspire students toward the lesson, therefore guaranteeing their access to current materials. Including visual effects into digital textbooks seems like a good way to enhance UAE students' learning experience generally. Therefore, while future research in this topic should allow the policymakers in the ministry of education to control alternative learning approaches and develop new criteria for this objective, this study advises inclusion of visual impacts in education curriculum is required.

References

Abruzzi, Kristen J., Lenis, Cristina, Romero, Yansi V., Maser, Kevin J., Morote, Elsa-Sofia (Spring 2016). Does Participation in Extracurricular Activities Impact Student Achievement? *Journal for Leadership and Instruction*, 15(1), 21–26.

Broaddus, Allie, Brandon Jaquis, Colt Jones, Scarlet Jost, Andrew Lang, Ailin Li, Qiwen Li, Philip Nelson, Esther Spear (2019). Fitbits, field-tests, and grades: The effects of a healthy and physically active lifestyle on the academic performance of first year college students. *International Journal of Sport and Exercise Psychology*, 1–12.

Brophy, D. R. (2006). A comparison of individual and group efforts to creatively solve contrasting types of problems. *Creativity Research Journal*, *18*(3), 293-315.

Chang, Y. S. (2021). Applying the arcs motivation theory for the assessment of AR digital media design learning effectiveness. *Sustainability*, *13*(21), 12296.

Chung, E., Noor, N. M., & Mathew, V. N. (2020). Are you ready? An assessment of online learning readiness among university students. *International Journal of Academic Research in Progressive Education and Development*, *9*(1), 301-317.

Chung, H. K., & Ko, J. H. (2023). Augmented Reality-based Educational Content Application Development. *Journal of Mobile Multimedia*, 1021-1030.

DeHaan, R. L. (2011). Teaching creative science thinking. *Science*, *334*(6062), 1499-1500.

Enik, O. A., Weilert, N. T., Mamontova, M. A., & Polyanskaya, E. A. (2013). Using of promethean interactive equipment in preschool education process. *In the World of Scientific Discoveries/V World of Scientific Discoveries*.

Howard, J. L., Bureau, J., Guay, F., Chong, J. X., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. Perspectives on Psychological Science, 16(6), 1300-1323.

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

Jadama, M. E. (2014). Student perspectives on Teaching Techniques and Outstanding Teachers *Journal of the Scholarship of Teaching and Learning*, 7(2).

Jong, M. S. Y. (2020). Promoting elementary pupils' learning motivation in environmental education with mobile inquiry-oriented ambience-aware fieldwork. *International Journal of Environmental Research and Public Health*, *17*(7), 2504.

Jovita, F. P. (2018). The impact of visual arts in students' academic performance. *International Journal of Education and Research*, *6*(7), 121-130.

Kearney, W. S., & Garfield, T. A. (2022). Student readiness to learn and teacher effectiveness: Two key factors in middle grades mathematics achievement. In *Dialogues in Middle Level Education Research Volume 1* (pp. 29-46). Routledge.

Liu, Y. (2022). Innovation of teaching method of digital media art based on convolutional neural network. *Advances in Multimedia*, *2022*.

Liu, Y., Hau, K. T., Liu, H., Wu, J., Wang, X., & Zheng, X. (2020). Multiplicative effect of intrinsic and extrinsic motivation on academic performance: A longitudinal study of Chinese students. Journal of personality, 88(3), 584-595.

Mihardi, S., Derlina, D., Siregar, A. M., & Abd Hakim, S. (2022, December). Needs Assessment of Alternative Learning Management Systems in Online Learning with Massive Users. In *Proceedings of the 4th International Conference on Innovation in Education, Science and Culture, ICIESC 2022, 11 October 2022, Medan, Indonesia*.

Mustafa Ayrala, Nedim Özdemira, Leyla Yılmaz Fındıka, Hakan Özarslana, Ahmet Ünlüa. (2014). the relationship between the students' achievement of Turkish language class and the central exam score procedia. *Social and behavioral sciences*, 143(2014), 721-725.

Okello, J., Angol, D., Mwesigwa, D., & Student, M. A. (2020). Factors affecting academic performance of pupils in universal primary education (UPE) schools in Uganda. *South Asian J. Dev. Res*, *3*, 1-13.

Robinson, K. (2001). *Out of our minds. Learning to be creative*. West Sussex: Capstone Publishing Limited.

Schacter, J., Thum, Y. M., & Zifkin, D. (2006). How much does creative teaching enhance elementary school students' achievement? *The Journal of Creative Behavior*, *40*(1), 47-72.

ISSN: 2455-8834

Volume:09, Issue:10 "October 2024"

Schoevers, E. M., Leseman, P. P., Slot, E. M., Bakker, A., Keijzer, R., & Kroesbergen, E. H. (2019). Promoting pupils' creative thinking in primary school mathematics: A case study. *Thinking skills and creativity*, *31*, 323-334.

Stajković, Alexander, Bandura, Albert, Locke, Edwin, Lee, Dongseop, Sergent, Kayla (January 2018). "Test of three conceptual models of influence of the big five personality traits and self-efficacy on academic performance: A meta-analytic path-analysis". *Personality and Individual Differences.* 120, 238–245.

Tabieh, A. A., Al-Hileh, M. M., Abu Afifa, H. M., & Abuzagha, H. Y. (2021). The Effect of Using Digital Storytelling on Developing Active Listening and Creative Thinking Skills. *European Journal of Educational Research*, *10*(1), 13-21.

Van Themaat, J. V. L. (2019). Thinking together changes the educational experiences, provision and outcomes for SEND pupils–professional learning communities enhancing practice, pedagogy and innovation. *Support for Learning*, *34*(3), 290-311.

Wang, T. (2021). An analysis on the Innovation of Visual Communication Design Teaching in the Digital Age. *Frontiers in Art Research*, *3*(1).

Wulandari, P., Asrowi, A., & Djono, D. (2022). Preliminary Study on the Development of Infographic-Based Islamic Education Teaching Materials to Improve Soft Skills for High School Students in Surakarta. *Jurnal Pendidikan Agama Islam*, *19*(1), 29-40.

