

Harnessing Animation for E-Content in Education: A Comprehensive Analysis

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Abstract

Background: The integration of animation into e-content has emerged as a promising approach to enrich digital education. As digital learning environments evolve, understanding the role of animation in enhancing learner engagement and comprehension becomes increasingly important.

Purpose: This study aims to investigate the benefits, challenges, and implications of using animation in educational e-content. It seeks to offer insights into how animation can support teaching and learning processes in digital contexts.

Methods: A mixed-methods approach was employed, combining a comprehensive literature review, data interpretation, and analysis of expert opinions. This methodology was designed to provide a well-rounded understanding of the impact of animation in educational settings.

Results: A mixed-methods approach was employed, combining a comprehensive literature review, data interpretation, and analysis of expert opinions. This methodology was designed to provide a well-rounded understanding of the impact of animation in educational settings.

Conclusions: Animation holds strong potential to enhance educational experiences when thoughtfully integrated into e-content. Educators and instructional designers should consider both its benefits and limitations to maximize its effectiveness in digital learning environments.

Keywords: Animation, E-Content, Education, Online Learning, Blended mode of Learning, Teaching, Learning, ICT tools.

1. Introduction

With the advancement in technology, animation has become increasingly prevalent in each and every sector of our daily life. Use of animation has been very dominant in today's teaching learning method involving educational contexts, offering educators and instructional designers a versatile tool to engage and instruct learners in digital environments. Dependency on digital medium was started post 2015 but during the time of pandemic or Covid there sees the highest surge of inclination towards digital medium. We can say that Covid acts as a catalyst to get digitally dependent. Be it in education, IT sector, online transactions. Most of the Schools, Colleges, and Universities shifted towards online teaching learning which embeds flipped learning methods, using of e-content, and peer grading methods during the time of pandemic, with having no other options left in hand. Now in the post Covid era, when things are all normal then also there has been a trend of using blended methods of learning. In India, UGC(University Grants Commission, New Delhi) has been also suggesting using blended learning. Blended learning involves technology integrated into school, colleges & university, which results in staying focussed on the subjects they are students. As per the reports or the concept note published by UGC*, It has also suggested that it provides autonomy to the students, allows instant diagnostic information and student feedback, promotes student ownership, and enables students to learn at their own pace [1].

Now blended learning involves creating ppt, using animation, using interactive elements to make it fun loving and easy to communicate, easy to understand, easy to remember and easy to interact so that it creates a visual impact on the minds of the students and making education much more interactive. Along with the increase of population, globalization is also playing a huge role in education. Nowadays education has become very easy to access from any place and at any time wherever the students want. Several Government sites such Swayam, Nptel are promoting MOOCS (Massive open online courses). These types of courses also involve videos, animations which simplifies the way of teaching learning. And as we all know that video or animation or motion pictures are more effective tool than mere text or images to simplify things & give more elicitation of high-arousal emotional states, this has been established as reports suggested by M. Horvat, D. Kukolja, and D. Ivanec, "Comparing affective responses to standardized pictures and videos" [2].

2. Objectives of the Study

The main objective of this research is to examine the use of the animation in creating e-content for educational purposes. The specifically aims to:

- i Trace the effectiveness of using animation in development e-content.
- ii Find the limitation to create e-content and embed it into academics .
- iii To provide feedbacks and inputs from academicians and instructional designer, working professional in animation sector to leverage animation in developing e-content.
- iv This study will also take insights from students to check whether animated e-content is helping them or not in their academics or they are getting diverted or confused when animations are used in e-content.
- v To examine what are the limitations they are facing while participating in blended learning based on animated e-contents.

3. Methodology

The researcher will undergo both qualitative and quantitative analysis. There will be further steps such as literature review, data collection, data analysis, and expert opinion. He will form a survey questionnaire for students to collect the data. A separate set of questionnaires will be formed for taking insights from academicians, educators & industry professionals.

4. Review of Literature

Based on existing research on the use of animation in developing e-content for education from academic journals, educational technology publications, and case studies, I will synthesize the data.

4.1 Integrating Animation with Experiential Learning Approach to Enhance Students' Engagement in the Learning Process

The researchers have discussed the techniques of using experimental learning to engage more students. They have elaborated about incorporating animation in conjunction with pedagogies to encourage and to motivate the students to take part actively in education. In-order to develop a student centric learning, experimental learning should be

incorporated which will naturally spark the interest of the students [3].

4.2 Animation for learning: Enhancement of learning through animation

In the era of digital evolution, a regular and conventional method of teaching learning is struggling to meet the young people's understanding. Interactive design such as animation can enhance classroom teaching by presenting ideas in a visually stimulating manner, retaining information for longer, and reducing boredom [4]. It has been also found that a deep-rooted impact has fallen on the children's intellect due to the use of animation which makes learning much more enjoyable and easy to remember for the young minds [5]. It also suggests that guardians and the stakeholders also should advocate for inclusion of animation in education as it has been observed that it catches much more attention of students than regular chalk and talk type of learning. With inventions of various tools and software it has become very easy to produce animated e-content for instructional materials for the teachers and to incorporate them in their regular teaching learning process.

4.3 Use of Animation in Classrooms at Higher Learning Institutions

The researchers have conducted a study based on Malaysian undergraduates, where they have found that the students are much more interested in learning which uses animation and it also helps them to enhance their computer skills. It has been also observed that animation has been much more coherent to deliver information and to make deliverables much more presentable and interactive. But the study has also suggested that creating animated content can be very time consuming and if it is used excessively it could be fatal as it can also distract the students from the key point of focus [6].

4.4 Does Animation Facilitate Better Learning in Primary Education? A Comparative Study of Three Different Subjects

Currently a trend is growing in modern day's classroom to introduce Computer-mediated communication (CMC) which requires human interaction and insights, which is shareable through networked computer environments. In general a teacher or a mentor plays a vital role to select, arrange, and determine instructional strategies and to determine success in learning. It is because of the digital revolution which has opened new ways for teaching and learning. Further research has suggested that use of

technology can inspire young children to learning process. Animation as by default is very attractive, interactive and has its own fun element increase the chance of the anchoring the students to learning much more than any other conventional methods of teaching learning process.

4.5 Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions

The objective of the study is to analyse teacher's perception of the challenges they face to use ICT classrooms. The survey was conducted from 100 secondary school teachers in Melaka, Malaysia. The report suggests limited access; lack of technical support, lack of training, lack of time and lack of teachers' competency are the key issues for coping up with ICT tools and implementing new methods of teaching learning in modern era of education. The research also provides information and recommendations for integrating new technologies into teaching learning.

4.6 Role of Multimedia and Animation in the System of Education in India

With the development of modern technologies, the hunger of learning has increased a lot but at the same time the quest for new interactive methods of teacher learning is also growing in the current education system. The internet has also led to the rise of distance education once again which definitely needs information and communication technology resources into the educational process. This method of modern day's education allows both teachers and students to stay in contact through electronic communication and other internet based tools [7]. The report also suggests that distance learning allows individuals to develop their talent and join the global information community. To address modern challenges, several electronic based information; multimedia encyclopaedias are available which makes the teaching learning process easy. In-order to survive and to sustain in this modern world students need to develop their skill in understanding new information and telecommunication technologies or professional knowledge.

4.7 Integrating Animation with Experiential Learning Approach to Enhance Students' Engagement in the Learning Process

This article suggests how to increase student's involvement in the learning process by using animation in the form of experimental learning strategy. This generation of students are much more affined towards the digital environment. Growth of technology is regarded in the educational field as

a potent tool for producing an enormous variety of learning materials.

The report also suggests that employment of multimedia technology in education is growing in an exponential curve which results in creating an engaging environment, that's why animation has been incorporated into the educational system because it is an everyday occurrence for the students [8].

4.8 Animation effectiveness for E-learning with progressive web APP approach: A narrative review

In-order to create an interactive engaging material which draws students attention multimedia and animation is required which includes animation, audio, video, graphics, and even text.

The interactive element in multimedia presentation implies a direct connection between interactivity and multimedia learning initiatives that might augment the apparent advantages of emotive states. Desires, intents, beliefs, frustrating moods, emotions, and attitudes of students are all considered effective. Though animation aspires students to draw more attention in the learning process but it still has certain gaps [9].

5. Research Problem

The research problem in this study deals with the effectiveness and challenges of embedding animation into e-content for education. Here remain the key questions:

- i What are the key points that contribute to the effectiveness of animated e-content in facilitating learning and knowledge acquisition?
- ii What are the limitations associated with the use of animation in educational contexts, and how can they be resolved?
- iii What are the current trends which could shape the future of use of animation in e-content to be used in academics?

6. Data Collection

Two separate sets of questionnaires have been distributed to determine the research problem. One set of questionnaires has been circulated among more than 100 numbers of students through Google form. And another set of questionnaires has been circulated among academicians, industry professionals.

7. Data Interpretation

(A):The first set of questionnaires which has been distributed to the students, here are the findings:

Question number 1:

What is your current level of education?

124 responses

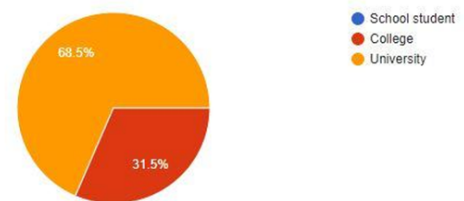


Figure 1

The image shows -

- i The yellow colour in the Pie chart shows that 68.5 % students are from University. Whereas the red ones show that 31.5% students are from College.

Question number 2:

How frequently do you encounter e-content with animations in your educational materials?

124 responses

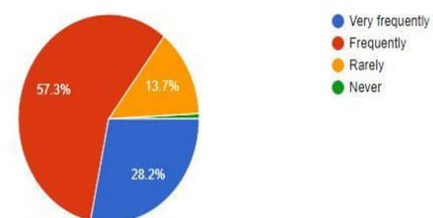


Figure 2

The image shows -

- i 57.3% of them have said they do encounter econtent with animations in educational materials Frequently.
- ii 28.2% of them have said they do encounter econtent with animations in educational materials Very Frequently.
- iii 13.7% of them have said they do encounter econtent with animations in educational materials Rarely.
- iv 0.8% of them have said they do encounter econtent with animations in educational materials Never.

Question number 3:

The image shows -

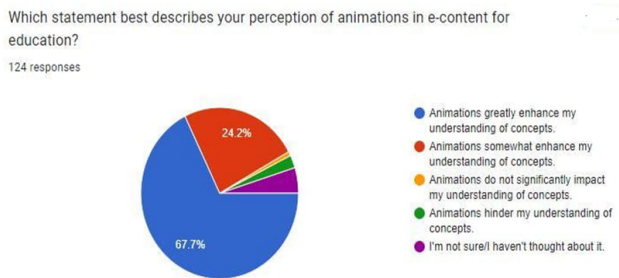


Figure 3

- i 67.7% of them have opted for Animations greatly enhance my understanding of concepts.
- ii 24.2% of them have opted for Animations somewhat enhance my understanding of concepts.
- iii 0.8% of them have opted for Animations do not significantly impact my understanding of concepts
- iv 2.4% of them have chosen the option for Animations hinder my understanding of concepts.
- v 4.8% of them said that "I'm not sure/I haven't thought about it."

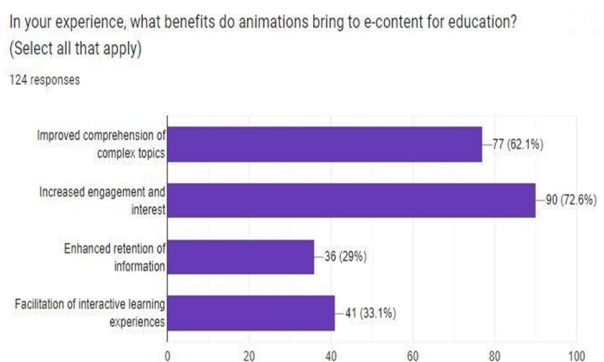
Question number 4:

Figure 4

The image shows -

- i 62.1% of them have opted for Improved comprehension of complex topics
- ii 77.6% of them have opted for Increased engagement and interest.
- iii 29% of them have opted for Enhanced retention of information.
- iv 33.1% of them have chosen the option for Facilitation of interactive learning experiences.

These above data shows that students have opted for multiple selections such as both or may be some have opted for all four options which clearly shows that using animation e-content development has facilitated them in multiple ways.

Question number 5:

Which subjects do you think benefit the most from animations in e-content?

124 responses

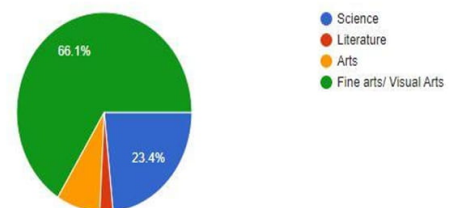


Figure 5

The image shows -

- i 66.1% of them have opted for Fine arts/ Visual Arts
- ii 23.4% of them have opted for Science
- iii 8.1% of them have opted for Arts
- iv 2.4% of them have opted for Literature

Question number 6:

Have animations in e-content ever helped you grasp a concept that was difficult to understand through text alone?

124 responses

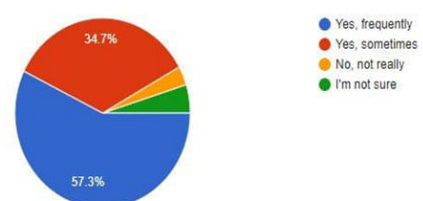


Figure 6

The image shows -

- i 57.3% of them said Yes, frequently.
- ii 34.7% of them said Yes, sometimes
- iii 3.2% of them said No, not really
- iv 4.8% of them have said I'm not sure

Question number 7:**The image shows -**

How do you typically interact with e-content containing animations?
124 responses

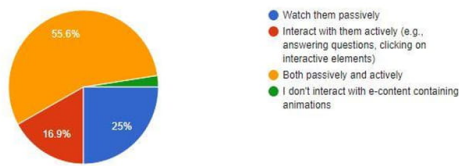


Figure 7

- i 25% of them have said Watch them passively
- ii 16.9% of them have said Interact with them actively (e.g. answering questions, clicking on interactive elements)
- iii 55.2% of them said Both passively and actively
- iv 2.4% of them said I don't interact with e-content containing animations

Question number 8:

Do you believe animations in e-content contribute to a more enjoyable learning experience?
124 responses

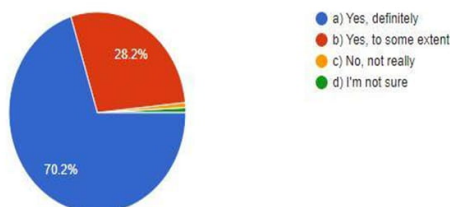


Figure 8

The image shows -

- i 41.9% of them have said Very effective
- ii 29% of them have said Extremely effective
- iii 27.4% of them said Moderately effective
- iv 7.3% of them said Slightly effective
- v 1.6% of them said Not effective at all

Question number 9:

The image shows -

- i 70.2% of them have said Yes, definitely
- ii 28.2% of them have said Yes, to some extent
- iii 0.8% of them said No, not really

Do you believe animations in e-content contribute to a more enjoyable learning experience?
124 responses

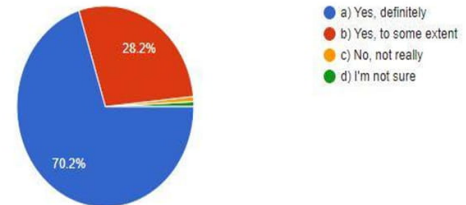


Figure 9

How satisfied are you with the current integration of animations in e-content for your education?
124 responses

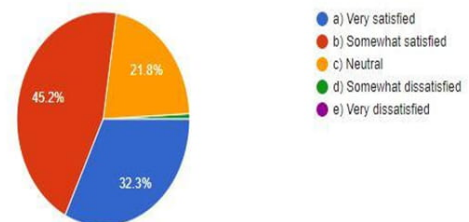


Figure 10

- iv 0.8% of them said I'm not sure

Question number 10:

The image shows -

- i 32.3% of them have said Very satisfied
- ii 45.2% of them have said Somewhat satisfied
- iii 21.8% of them said Neutral
- iv 0.8% of them said Somewhat dissatisfied

Question number 11:

The image shows -

- i 63.7% of them have opted for Technical glitches or loading issues
- ii 29.8% of them have opted for Distraction from main learning objectives
- iii 29% of them have opted for Inaccuracy or oversimplification of content
- iv 29.8% of them have chosen the option for Limited accessibility for students with disabilities

These above data shows that students have opted for multiple selection such as Technical glitches or

What limitations or demerits have you encountered with the use of animations in e-content for education? (Select all that apply)

124 responses

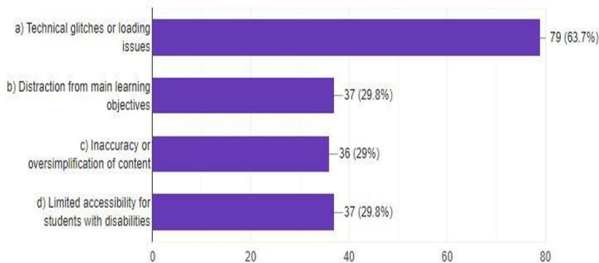


Figure 11

loading issues, Distraction from main learning objectives/ Inaccuracy or oversimplification of content/ Limited accessibility for students with disabilities both or may be some have opted for all four options which clearly shows that using animation also have some definite problems and demerits at the same time.

Question number 12:

Do you believe animations in e-content can sometimes oversimplify complex concepts?

124 responses

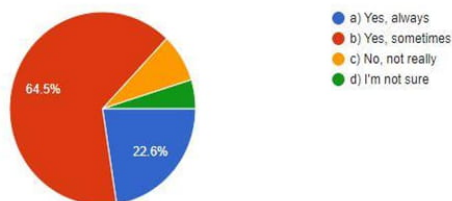


Figure 12

The image shows -

- i 64.5% of them have said Yes, sometimes
- ii 22.6% of them have said Yes, always
- iii 8.1% of them said No, not really
- iv 4.8% of them said I'm not sure

Question number 13:

The image shows -

- i 43.5% of them have said Yes, sometimes
- ii 36.3% of them have said No, not really
- iii 12.1% of them said I'm not sure

Have you encountered situations where animations in e-content were irrelevant or unnecessary?

124 responses

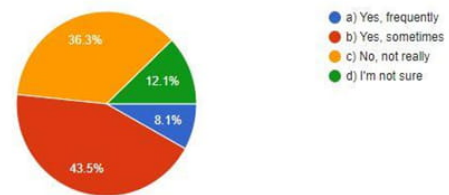


Figure 13

- iv 8.1% of them said Yes, frequently

Part (B):

The second set of questionnaire which has been distributed to the academicians & industry professionals, here are the findings:

Question number 1:

How familiar are you with the use of animation in e-content for education?

124 responses



Figure 14

The image shows -

- i 100% of them have said Very familiar means they are very familiar with the use of animation in e-content for education.

Question number 2:

In your opinion, what are the primary advantages of incorporating animations into e-content for education? (Select all that apply)

124 responses

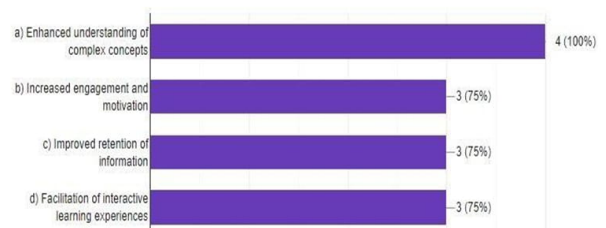


Figure 15

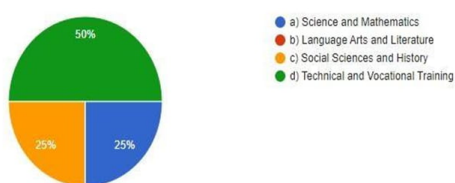
The image shows -

- i 100% of them have opted for Enhanced understanding of complex concepts
- ii 75% of them have opted for Increased engagement and motivation
- iii 75% of them have opted for Improved retention of information
- iv 75% of them have chosen the Facilitation of interactive learning experiences

These above data shows that industry professionals and academicians have opted for multiple selection such as Enhanced understanding of complex concepts, Increased engagement and motivation, Improved retention of information, Facilitation of interactive learning experiences or maybe some have opted for all four options which clearly shows that using animation in e-content helps to enhance understanding of the complex subject.

Question number 3:

Which areas of education do you believe benefit the most from the use of animation in e-content?

**Figure 16****The image shows -**

- i 50% of them have opted for Technical and Vocational Training
- ii 25% of them have opted for Social Sciences and History
- iii 25% of them have opted for Science and Mathematics experiences

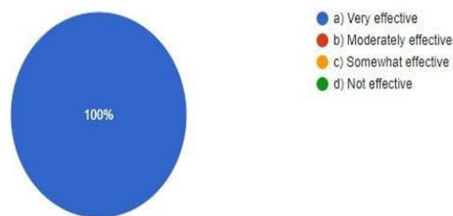
Question number 4: The Figure 17, shows -

- i 100% of them have opted for the option Very Effective

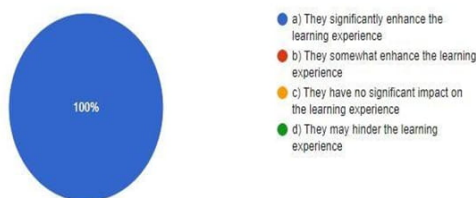
Question number 5:**The Figure 18 shows -**

- i 100% of them have opted for the option They significantly enhance the learning experience

From your perspective, how effective are animations in e-content for conveying abstract or difficult-to-understand concepts?

**Figure 17**

How do you perceive the role of animations in enhancing the overall learning experience in e-content?

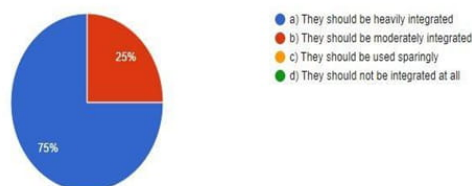
**Figure 18****Question number 6:****The image shows -**

- i 75% of them have opted for They should be heavily integrated
- ii 25% of them have opted for They should be moderately integrated

Question number 7:**The image shows -**

- i 50% of them have opted for Very satisfied
- ii 25% of them have opted for Somewhat satisfied
- iii 25% of them have opted for Neutral

In your opinion, to what extent should animations be integrated into e-content for educational purposes?

**Figure 19**

How satisfied are you with the current quality and variety of animations used in e-content for education?

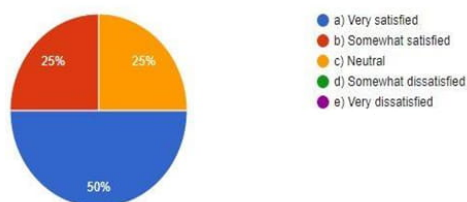


Figure 20

Question number 8:

Do you believe that the benefits of using animations in e-content outweigh the potential challenges?

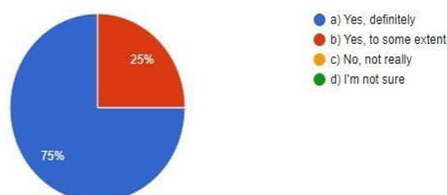


Figure 21

The image shows -

- i 75% of them have opted for Yes, definitely
- ii 25% of them have opted for Yes, to some extent

8. Conclusion

From the above responses, which we have received from the students, academicians and other industry professionals, and it concludes as follows; Animation plays a significant role in enhancing learning experience. A large number of students have said that they have encountered animation in their daily learning process and they have further advocated for preferring animation as it helps to enhance their understanding of concepts. They have also said use of animation in e-content have benefited them to simplify complex topics, to increase engagement & interest and to facilitate interactive learning experiences. At the same time they have noted several limitation and challenges associated with the use of animation in e-content such as technical glitches, distraction from main learning objectives, inaccuracy and over simplification of content and limited accessibility for students with disabilities.

On the other hand it has been observed from the responses received from academicians and industry professionals,

which depicts the advantages of incorporating animations into e-content including simplification of complex concepts, creating a motivational ambience which ultimately results in retention of more students during the teaching learning process. In Spite of all the benefits highlighted by both students and professionals, they have also mentioned that there must be careful implementation and strict quality control of animated based e-content to ensure their effectiveness. We can say that there is absolute necessity of addressing the challenge associated with integration of animation in the e-content to cope up with issues like accuracy and verification of the content in order to maximize their impact.

Finally to conclude we can say that animation has emerged as a very useful tool to create dynamic and interactive learning experiences in digital environments, contributing to the advancement of education in the modern days of education.

Authorship contribution

Abhishek Bhattacharjee led the research as a significant contributor.

Funding

No funding was taken for conducting this research.

Conflict of interest

The authors state that there is no conflict of interest.

Similarity Index

I hereby confirm that there is no similarity index in abstract and conclusion while overall is less than 10% where individual source contribution is 2% or less than it.

Declaration

It is original and has neither been sent elsewhere nor published anywhere. This research has been conducted ethically, reporting of those involved in this article.

References

- [1] University Grants Commission. (2021). Guidelines for online/blended learning in higher education in the post-COVID era. UGC, New Delhi.
- [2] Horvat, M., Kukulja, D., & Ivanec, D. (2015, May). Comparing affective responses to standardized pictures and videos: A study report. Paper presented

at the 38th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Opatija, Croatia.

- [3] Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson Education; Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press;
 - [4] Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
 - [5] Berney, S., & Bétrancourt, M. (2016). Does animation enhance learning? A meta-analysis. *Computers & Education*, 101, 150–167. <https://doi.org/10.1016/j.compedu.2016.06.005>
 - [6] Yunus, M. M., Salehi, H., & Chenzi, C. (2012). Integrating social networking tools into ESL writing classroom: Strengths and weaknesses. *English Language Teaching*, 5(8), 42–48. <https://doi.org/10.5539/elt.v5n8p42>
 - [7] UNESCO. (2020). Distance learning strategies in response to COVID-19 school closures. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000373305>
 - [8] Neo, M., & Neo, K. T. K. (2009). Engaging students in multimedia-mediated constructivist learning—Students’ perceptions. *Educational Technology & Society*, 12(2), 254–266. <https://www.jstor.org/stable/jeductechsoci.12.2.254>
 - [9] Moreno, R., & Mayer, R. E. (2007). Interactive multimodal learning environments: Special issue on interactive learning environments: Contemporary issues and trends. *Educational Psychology Review*, 19(3), 309–326. <https://doi.org/10.1007/s10648-007-9047-2>
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