“The effect of interactive design on learning outcomes development in an e- learning environment”

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Abstract:

This contemporary era is all about e-learning, particularly with the availability of technologies that support this sort of education. These technologies are based on the Internet and modern communications programs, which have enabled easy communication between instructors and students, the interchange of information and files, and the exchange and presentation of audio and video clips. This software has developed virtual classrooms where professors can interact with students.

These virtual classrooms also offer advantages not seen in traditional classrooms, such as the ability for students to access information at any time and from any location. They can also get it when it is needed. The usage of digital platforms in education is thought to have a favorable impact on the educational process when handled appropriately.

E-learning allows teachers and students to access the Internet and use multimedia to learn, resulting in increased information and data acquisition. E-learning also motivates student’s more than traditional education.

This article investigates the response to two concerns about interactive design, whether it improves students' interest in the content presented to them in the e-learning environment, and whether it helps to build and facilitate teaching and learning. As a result, the study sought to determine the influence of adopting interactive design techniques such as (Motion graphics) technology in the development of university e-learning in order to boost university students' participation with the e-learning platform and produce better learning outcomes.

Good results were achieved because students demonstrated their interaction with the animation clip, which piqued their curiosity and attention. They remembered most of the information in the tape and expressed a willingness to use this strategy in future lectures.

Keywords:

Motion graphics, E-learning, Interactive design, Learning outcomes

الملخص:

إن العصر الحالي هو عصر التعليم الإلكتروني، خصوصاً مع توافر التقنيات التي يستند عليها هذا النوع من التعليم، وهذه التقنيات تعتمد على شبكة الإنترنت وعلى برامج الاتصالات الحديثة التي أتاحت سهولة الاتصال بين الهيئة التدريسية والطلاب، وتبادل المعلومات والملفات، وكذلك تبادل مقاطع الفيديو بالصوت والصورة وعرضها. إن هذه البرمجيات قد

أنشأت فصولاً دراسية افتراضية تتواصل فيها الهيئات التدريسية مع الطلاب. كما أن هذه الفصول الدراسية الافتراضية تشتمل على مميزات غير متوفرة فى الفصول الاعتيادية، فالطالب يستطيع الدخول في أي وقت يشاء ومن أي مكان للحصول على المعلومات. كما يمكن أن يسترجعها متى ما احتاج إليها. إن استخدام المنصات الرقمية في التعليم تعتبر ذات تأثير إيجابي في العملية التعليمية إن تم استخدام الوسائل المناسبة.

هذه الورقة تبحث فى الإجابة على سؤالين يتمحوران حول التصميم التفاعلي إن كان يزيد من اهتمام الطلاب تجاه المعلومات الموجهة إليهم في بيئة التعلم الإلكتروني، وهل يساهم ذلك في تطوير وتسهيل التعليم والتعلم؟ لذا كان الهدف من الدراسة هو معرفة أثر استخدام تقنيات التصميم التفاعلي مثل تقنية (الرسوميات المتحركة) في تطوير التعليم الإلكتروني الجامعي لزيادة تفاعل طلاب الجامعات على منصة التعليم الإلكترونى لتحقيق نتائج تعلم أفضل.

في التعليم الإلكتروني فإن المعلم والطلاب يستطيعون الولوج إلى الإنترنت واستخدام الوسائط المتعددة في التعلم، وهذا يؤدي إلى مزيد من المعلومات والبيانات المكتسبة، كذلك فإن التعليم الإلكتروني يمنح الطلاب تحفيزاً أعلى من التعليم التقليدي.

استخدم البحث المنهج الوصفي التحليلي التطبيقي من خلال وصف آلية استخدام التصميم التفاعلى بتقنية الرسوميات المتحركة وتطبيقها ثم تحليل عينة البحث المستهدفة (عدد الطلاب المشاركين في عينة الدراسة ٧١) من جامعة جدارا، في مساق "مدخل إلى المستقبل"

وتم التوصل إلى نتائج جيدة حيث أبدى الطلاب تفاعلهم مع مقطع الرسوم المتحركة وجذب اهتمامهم وانتباههم، وتذكروا العديد من المعلومات التي عرضت في المقطع، وأبدوا رغبتهم في عرض المزيد من المحاضرات بهذه التقنية.

الكلمات الدالة:

الرسوميات المتحركة، التعليم الإلكتروني، التصميم التفاعلي، ناتج التعلم.

Introduction:

Corona crisis, which swept the world in 2020, had a significant impact on many facets of society. Closures and curfews were implemented in numerous nations. People were prohibited from gathering for long periods of time based on World Health Organization recommendations, so it is no longer possible to go to universities and schools to take lectures, so lessons could not be taken as usual over the years, and education quickly shifted from face-to-face to electronic learning during that period. Universities resorted to employing smart applications and the Internet to deliver lectures to students electronically, and this style of education demanded a high level of accountability from both professors and students.

E-learning is a structured process aimed at achieving educational outcomes through the use of technological means that provide sound, images, films, and interaction between the learner, content, and educational activities at the appropriate time and place for him. (Al-Tarawneh, 2022, p. 4378)[7]. This is not to say that e-learning did not exist prior to the Corona pandemic; however, it was growing at a slow rate of 15.4% per year. (Al-Tarawneh, 2022, p. 4376)[7]. There were challenges to distance education prior to the emergence of the Corona pandemic, the most significant of which was the separation of the teacher from the learner and the classroom, as well as the lack of interaction between learners and teachers. (Al-Sharaa, Qadi, 2022, p. 344)[5]. Following the end of the Corona crisis, Jordan's Ministry of Higher Education decided to keep e-learning in Jordanian public and private universities by integrating it with traditional face-to-face education. The percentage of university courses subject to the e-learning system was determined to be 45% of the total university courses subject to the e-learning system for each major.

This study focuses on three major axes: The first is research procedures and their definition. The second axis is an analytical study of e-learning in the traditional way of teaching, e-learning methods, and the use of motion graphics, and the third axis is the applied part, where the lectures are designed using motion graphics and the effects on the students are studied. The study is concluded with findings, recommendations, and references.

1. Research procedures:

1-1: Research Problem:

Because of the lack of visible connection between professors and students in e-learning, many students lose interest during electronic lectures and grow bored. As a result, the research challenge may be defined as an effort to answer the following questions:

- Does using interactive design enhance students' interest in the information delivered during electronic lectures?
- Can interactive design help with the development and facilitation of e-learning?

1-2: Research Purpose:

This research aims to:

- Highlight the importance of using digital technology in teaching.
- This research provides feedback for people looking to improve e-learning at universities.

1-3: Research objectives:

- Understanding the impact of interactive design and motion graphics on university e-learning.
- Increasing university students' participation on the e-learning platform can enhance learning outcomes.
- Determine the optimal presenting approach for the interactive design.

1-4: Research assumes:

- Research suggests that interactive design improves students' comprehension of e-learning content.
- Motion graphics design can enhance e-learning outcomes.

1-5: Research limitations:

- **Limitations of the objective:** Understanding how the usage of interactive design in the online learning environment influences the development of learning outcomes.
- **Spatial restrictions:** The private university in the Hashemite Kingdom of Jordan.
- **Time limits apply:** Academic year. 2024- 2025.

1-6: Research specifications:

This study will be carried out on a sample of students from Jadara University in Irbid, the Hashemite Kingdom of Jordan.

- The criteria include the consequences and stability of the research tool (interactive motion graphics design).
- Jadara University students were selected as the research sample.

1-7: Research Methodology:

This study employs analytical and descriptive methodologies to describe the mechanism of integrating interactive design with motion graphics and applying it to e-learning. The outcomes of a specific study sample are then examined.

1-8: Keyword definitions:

Motion graphics: A type of graphic design that involves drawing information and data, representing it with animated symbols, and creatively creating each symbol's movement in accordance with a cohesive directorial scenario in order to capture viewers' attention. (Zaidan, 2023)[3].

E-learning: A modern method of teaching that uses digital technologies for information visualization and online communication platforms. It accomplishes this by providing users with access to data and information via contemporary applications. (Abu-Ruman, 2022)[1].

It also refers to a way of employing modern software and electronics, including multimedia like audio and video, to offer educational content over the Internet. To achieve educational outcomes, all of these approaches entail the methodical employment of technical tools. (Al-Tarawneh, 2022)[7].

Interactive Design: In order to improve students' abilities and performance, interactive design in education tries to keep students' focus and attention in a learning environment. (Ashraf, 2023)[10]. Furthermore, the design is based on the interactive process that occurs between a human and digital content, allowing viewers to interact with the items displayed on screen (Castillo, 2023) [16].

Learning Outcome: The learning outcome is the scientific result that a student understands, can perform, and achieves at the end of a course or educational program. The student must acquire this information in order to assess where he stands or falls short in his performance. (Selmi et al., 2023) [4].

1-9: Research tools:

- Creating motion graphic clips to convey study information for three common university disciplines to students via online lecture.
- Conducting a questionnaire to assess students' understanding of motion graphic clips and their impact on learning outcomes.

1-10: Previous studies:

(Otoum, Farah, Al-Omari, Ghassan, 2022) investigated "the effect of e-learning in light of the Corona pandemic on faculty performance in Jordanian universities." The study aimed to determine how e-learning affected Jordanian university faculty members' performance during the coronavirus outbreak. The study's findings indicated that e-learning improved instructor effectiveness in Jordanian universities during the Corona pandemic while also increasing student participation in community service.

(Al-Tarawneh, 2022)[7] "Distance Learning During the Corona Pandemic in Jordanian Universities: A Case Study of Jerash University." The study aimed to analyze the factors influencing e-learning during the Corona Pandemic from the perspective of Jerash University faculty members.

The study's findings revealed that the factors influencing distance learning from the perspective of Jerash University faculty members were on a high level, with the faculty member's technological capabilities regarded as one of the most important factors that have a significant impact on the e- learning environment. Gender, years of experience, and academic rank were shown to have no statistically significant differences in the study.

At 2022 study conducted by (Odaibat, Anas. Sarayrah, and Iyad Muhammad)[2], "The obstacles to e-learning that Jordanian university faculty members face, as seen from their perspective," The study sought to investigate the e-learning challenges that Jordanian university faculty members faced, as well as the effects of variables such as gender, years of service, academic degree, and kind of specialization. The study concluded that Jordanian university faculty members experienced a high proportion of e-learning issues across all four categories of values. The sample is taken from the teaching faculty based on their experience, specialty, and academic degrees.

2. Research Methodology:

2-1: E-Learning:

Blended learning, which divides a course into two parts—a face-to-face and an electronic section—as well as electronic courses, are now important components of the educational process. This is especially true in higher education, as Jordanian universities continue to use face-to-face instruction. Overall, once certain traditional class lectures were delivered utilizing multimedia, the concept of e-learning gained acceptance. Students can now remotely attend lectures and seminars given in other countries using the Internet and interactive television technology. (Abu-Ruman, 2022)[1].

It is feasible to argue that the current era is the era of e-learning; it has become critical, especially with the availability of electronic technologies on which this type of education is constructed, and these technologies were initially entirely reliant on the internet. Second, modern communication programs have created virtual classrooms in which faculty and students can communicate easily, exchange information and files, and exchange and display audio and video clips. These virtual classrooms offer benefits that traditional classrooms do not have, such as the flexibility for students to attend the class from anywhere at any time and obtain materials anytime they need them. Even though the use of digital platforms in education is still in its early phases, it is expected to have a positive impact on the educational process, assuming appropriate strategies are being used.

Some individuals feel that there is no difference between e-learning and traditional learning, yet there are several distinctions. One of these distinctions is that students engage in more conversations and dialogues in e-learning. Another difference is that in traditional education, the teacher follows the curriculum book, however in e-learning, the teacher and students can

use the Internet and multimedia to learn, resulting in more information. Furthermore, e-learning engages student's more than traditional education.

However, e-learning has limitations that may impede it at times, such as the need for constant Internet access, the ability to use communication programs, and knowledge of file management applications. One of its drawbacks is poor performance by one or both parties in the educational process. Furthermore, there is a lack of involvement between students and their teachers, which might make them feel isolated. (Thareja, 2015)[14]

Jordanian universities were not well prepared for e-learning when the Corona epidemic hit the world, despite the fact that there had been a desire since the beginning of the second millennium to modernize traditional education to electronic, but Jordanian society rejected it at that time because it was considered unhelpful (Al-Abd, 2020)[15].

2-2. E-learning tools:

The computer is one of the most important technologies used in e-learning since it helps students enhance their educational attainment and develop skills such as analysis, composition, and creative thinking. It also provides them with a flexible environment in which they can try anything new and receive quick feedback on their responses, owing to the employment of specific applications and programs that provide students with interactive and interaction methods (Al-Momani, 2021)[9].

To improve learner satisfaction in the e-learning environment, instructional content must include interactive components that allow students to participate in the learning process; the interactive approach is recognized as one of the best ways to do this. Many research concluded that the interactive technique in e-learning increases student engagement, while other studies revealed that the way of teaching through texts only earned a poor position in the rankings of e-learning techniques (Kishabale, 2019)[13].

For e-learning to be effective and provide positive results from interactive ways, electronic applications must be used in a systematic and planned manner. One of the necessary foundations is the systematic creation of appropriate digital information, which leads to improved learning. When developing electronic content, it is necessary to consider educational psychology principles that are compatible with the learner's perceptual concepts. Electronic educational content that includes both verbal and visual facts and statistics, as well as explanatory visual presentations, outperforms content that only uses verbal terms. One technique is to organize course materials in the form of movies, graphics, and visual images. (Al-Moumani, 2021)[9].

As a result, using interactive multimedia in e-learning promotes student-learning engagement while also capturing attention and raising the desire to learn more. However, if e-learning is still based on outdated educational approaches, it is indistinguishable from traditional education, and many students consider it as useless, as shown in Figure No. (1)

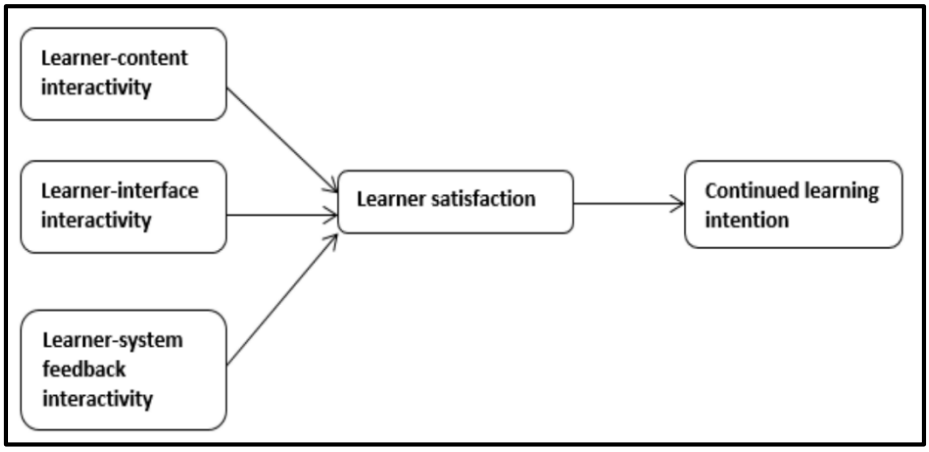

Figure No, (1) A conceptual model that illustrates the impact of using interactive learning as an external variable on satisfying the need for learning (Kishabale, 2019)[13].

2-3. Motion graphics applications:

Motion graphic technology is a multimedia tool that uses symbols, graphs, and forms that are manipulated in a way that produces a final product with appropriate sound effects. Thus, whether traditional or computerized, it could play a significant role in education. When motion graphic technology is employed in the classroom, it increases student engagement and enhances learning outcomes (Hapsari, 2019).[12]

The use of motion graphics significantly improves students' mental and cognitive achievements, while also providing benefits that cater to students' interests and desires in interactive learning. Furthermore, it was shown that while using motion graphics, students are more interested, focused, and capable of comprehending information (Hanif, 2020)[11].

Furthermore, motion graphic technologies have proven to be effective in marketing and are not limited to the field of education. It is today one of the most popular product promotion tactics, with a high audience appeal factor that positively influences customer purchasing decisions, as a result, advertisers increasingly want it. (Zaidan, 2023)[3].

When it comes to training and presenting the content of the training material, motion graphic technology helps to speed up the delivery of training information to trainees' minds, capture their interest and attention, keep them from getting bored while they listen to it, and help memorization and retention of information. (Morsi, 2021) [8].

In the field of awareness, (Zaidan, 2023)[3] discovered that motion graphics videos were far more successful than PPT files in influencing perception, cognition, and retention of environmental awareness-related information. This is because PPT files lacked the effects that motion graphics videos have.

This shows that motion graphic technology is one of the most in-demand technologies since it transforms uninteresting data into visually appealing graphics and makes challenging content easier to understand. Its color scheme can be tailored to match the subject matter. It is suitable for all ages and disciplines, and it aids in depicting scenes that are difficult to capture on camera or in real life. Motion graphic technology facilitates the comprehension and explanation of complex subjects. (Morsi, 2021)[8].

The study concludes that motion graphic technology has a significant impact on viewers, facilitates and aids in the delivery of information in a clear and efficient manner. Additionally, viewers interact with it and find it entertaining. It also simplifies material and allows viewers to remember it for longer periods of time than standard memorization strategies.

As a result, the study assumes that using motion graphic technology in electronic lectures makes complex information easier to understand, helps students remember it longer, and makes the topic more visually appealing and delightful.

3. Applications for motion graphic:

The application method-related motion graphic video created primarily includes the following technical scheme:

3.1. Video Design and Production Standards:

A two-minute and two-second motion graphic clip on the topic "The Future of the Internet of Things" (IoT) was made to test the study hypotheses and accomplish its objectives. The "Entrance to the Future" course at Jadara University is delivered via the university's e-learning system. After the students had watched the entire video clip, they were handed a survey. The study's goal is to investigate how watching a video clip developed with interactive motion graphic technology impacts university students enrolled in academic courses, as well as how much they interact with it. It should be emphasized that 71 students from various academic majors participated, with 34 male and 37 female. They were of various ages (from 18 to 33 years).

3.2. Scenes from the clip with motion graphics:

Figure 2: Scene 1

Figure 3: Scene 2

Figure 4: Scene 3

Figure ٥: Scene ٤

Figure ٦: Scene ٥

Figure ٧: Scene ٦

Figure 8: Scene 7

Figure 9: Scene 8

Figure 10: (video)

Video Link: https://drive.google.com/file/d/1tgI8gwYezp8gEu-W3fWcOxIzVphQRdqZ/view?usp=sharing

3-3. Survey axes:

Table 1: Display the survey's axis, the number of students who completed the questionnaire, and the percentage of students who interacted with the video.

Response / Statement	Strongly agree		Agree		Neutral		Disagree	
	No.	%	No.	%	No.	%	No.	%
1. The video captured attention and curiosity.	26	36.6%	38	53.5%	6	8.5%	1	1.4%
2. I remember a bit of the information displayed in the clip.	21	29.6%	37	52.1%	7	9.9%	6	8.5%
3. I remember most of the information displayed in the clip.	25	35.2%	35	49.3%	10	14.1%	1	1.4%
4. I don't remember any of the information displayed in the clip.	5	7%	7	9.9%	15	21.1%	44	62%

5. The information was displayed easily and simply.	28	39.4%	36	50.7%	5	7%	2	2.8%
6. Information was displayed clearly.	38	53.5%	30	42.3%	3	4.2%	0	0%
7. I watched the information display without getting bored.	31	43.7%	23	32.4%	15	21.1%	2	2.8%
8. The clip is helpful motivating, interesting and entertaining.	27	38%	37	52.1%	5	7%	2	2.8%
9.The clip successfully delivered the information from distance.	28	39.4%	34	47.9%	7	9.9%	2	2.8%
10. I got enough information from the clip about the topic of the lecture.	26	36.6%	37	52.1%	8	11.3%	0	0%
11. I had to re-watch the clip several times to absorb the information.	6	8.5%	17	23.9%	13	18.3%	35	49.3%
12. I am satisfied with the quality of the clip.	37	52.1%	31	43.7%	3	4.2%	0	0%
13. The clip contributes to distance learning and the explanation of the content.	30	42.3%	37	52.1%	3	4.2%	1	1.4%
14. The clip helped to acquire new knowledge and skills.	25	35.2%	34	47.9%	8	11.3%	4	5.6%
15. I support having more lectures this way. (Motion Graphic clips)	32	45.1%	26	36.6%	9	12.7%	4	5.6%
Rate the number of students to the percentage of answers	**٢٤.٦٠**	**36.15%**	**30.6**	**43.10%**	**7.8**	**10.99%**	**٦.٩٣**	**٩,٧٦%**

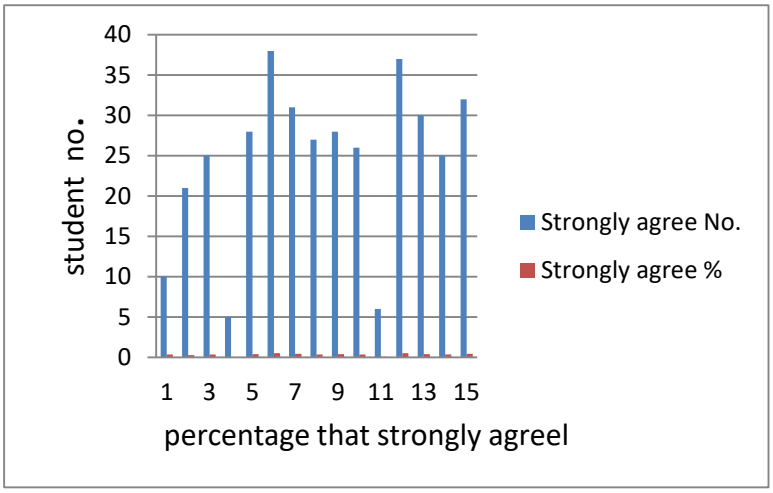

Figure 11: Students number to the percentage of those who strongly agree

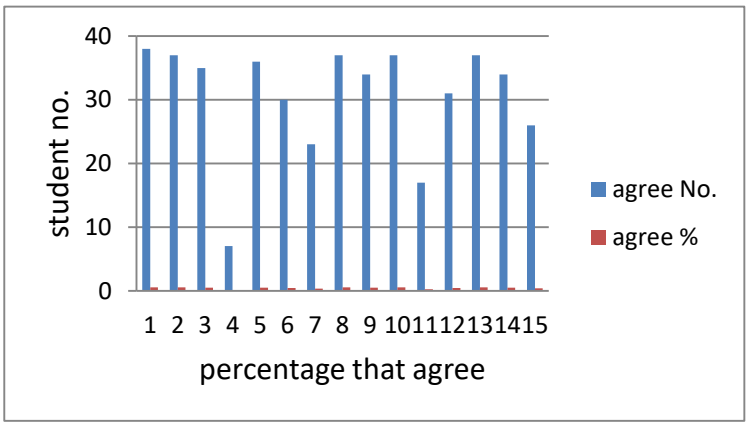

Figure 12: Students number to the percentage of those who agree

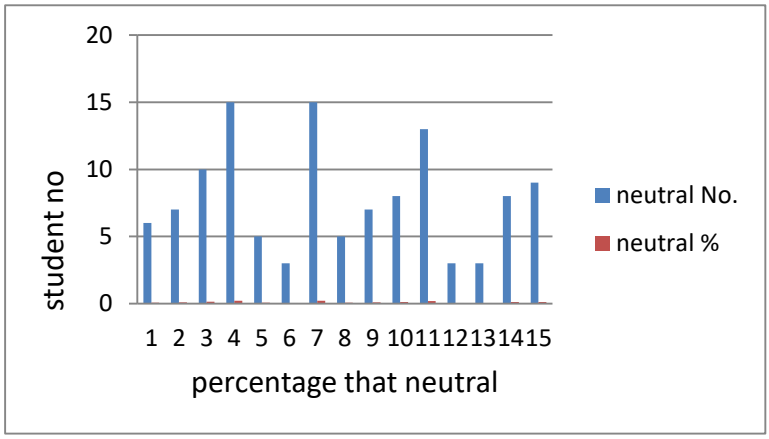

Figure 13: Students number to the percentage of those who felt neutral

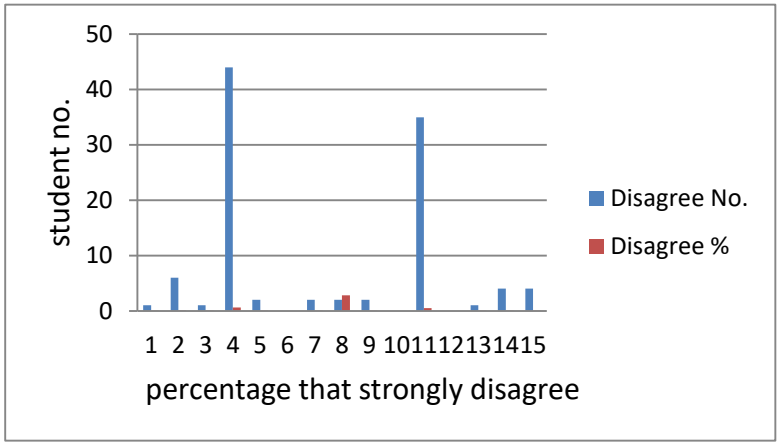

Figure 14: Students number to the percentage that disagreed

4.Results and conclusion :

4.1. Based on the preceding, the study comes to the following results:

1. Motion graphics technology enhances learning outcomes and is effective for online education in university.
2. Motion graphic effectively explained the content and directed students to key elements.
3. Motion graphic captured students' interest, and retained much of the information offered in the clip.
4. Most students prefer interactive lectures using motion visuals to clarify knowledge and make it more accessible.

4.2. Conclusion:

The use of motion graphics technology has efficiently simplified and facilitated access to information, pointing students to the basic aspects of the content while preserving most of the information offered in the video clip, and the majority of students prefer interactive lectures with animated images. This is obvious from the percentage of students' responses, which were as follows.

- The percentage of respondents who strongly agree with the utilization of motion graphics technology was (36.15%).
- The percentage of respondents who agreed to utilize this technology was (43.10).
- The percentage of neutral answers when utilizing this technique was (10.99%).
- The percentage of responses that disagreed with the usage of this technique was (9.76%).

5.Recommendations: After analyzing and discussion of the results, the study proposes the following actions:

1.Online courses should prioritize interactive design and incorporate motion graphics.
2.Organizing educational seminars to discuss how motion graphics might improve university students' e-learning experiences.
3.Further research is needed to assess the impact of interactive design on university students' skills, as this study focused on knowledge and information-based learning outcomes.

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