Revolutionizing Pedagogy: The Influence of H5P (HTML5 Package) Tools on Student Academic Achievement and Self-Efficacy

Nimer Abusalim[1], Mohammad Rayyan[2,*], Sarah Alshanmy[2], Sharif Alghazo[1,3], and Mohd Nour Al Salem[1]

[1]Department of English Language & Literature, School of Foreign Languages, University of Jordan, Amman, Jordan
[2]Department of European Languages, School of Foreign Languages, University of Jordan, Amman, Jordan
[3]Department of Foreign Languages, School of Arts, Humanities and Social Sciences, University of Sharjah, Sharjah, United Arab Emirates
Email: n.abusalim@ju.edu.jo (N.A.); m_rayyan@ju.edu.jo (M.R.); s.alshalmi@ju.edu.jo (S.A.); s.alghazo@ju.edu.jo (S.A.); Mo.AlSalem@ju.edu.jo (M.N.A.S.)
*Corresponding author

Manuscript received November 29, 2023; revised February 18, 2024; accepted March 18, 2024; published August 19, 2024

***Abstract*—As a new tool in the field of educational technology, H5P appears to have the potential to teach a second language (L2). This study aims to highlight the potential direction of upcoming teaching methods, sparking informed choices in educational approaches and guidelines by evaluating both the concrete and abstract results of incorporating H5P. To this end, this study compared H5P tools to conventional teaching methods to determine how they affected students' grades and confidence in learning German as a second language. The participants were split into two main groups: the control group and the experimental group. A noticeable difference in grades between these groups was demonstrated by our main findings, which were derived from a conventional t-test. This was further demonstrated by a different test, the Simple Linear Regression. According to the data, students who used H5P tools in the experimental group saw an increase in their self-confidence scores, whereas the scores of the control group slightly decreased. This change was supported by a second test, the Analysis of Covariance (ANCOVA). This research firmly backs the claim that H5P tools can increase academic achievement and student confidence. Consequently, it suggests that educators should contemplate integrating these tools into their teaching practices to enhance overall classroom results.**

***Keywords*—H5P, self-efficacy, academic achievement, blended learning, flipped classrooms**

I. Introduction

Digital tools like H5P, short for HTML5 Package, are increasingly used in contemporary education. This pattern reflects the necessity for innovative teaching methodologies while also recognizing the importance of catering to the technologically adept students of the current era. Beyond merely improving students' academic performance, the objective is to engage students and increase their confidence. Due to its variety of interactive features, such as games, quizzes, and interactive videos, H5P stands out as an important tool in second language (L2) pedagogy. The literature on the use of technology in education shows that technological tools can be effective in teaching specific areas of study. For example, Sinnayah *et al.* [1] explored the use of H5P in physiology education and showed that the tool led to an increase in the engagement level of students. It is essential to the flipped learning approach. Students who are taught using H5P engage in a multi-layered experience instead of merely watching a video, with checkpoints that gauge their understanding. If they are successful, they continue. However, if they are incorrect, they are directed back to pertinent video segments for review. This means that students cannot move on without passing each checkpoint that is connected to important concepts. Such a structured approach guarantees a deeper comprehension of the subject matter. This study explores how H5P affects students' academic results.

Our current study aims to investigate the role of H5P tools in teaching German as a second language and how they affect students' academic performance and self-confidence. Self-efficacy and academic performance are both important topics in the discussion of education. With the former, it is simple to evaluate various teaching strategies because it provides a quantifiable view of student progress. Self-efficacy, on the other hand, illuminates students' perceptions of their skills, which may have a significant impact on their motivation and, consequently, their academic performance. Global educational systems have been built for a long time on tried-and-true traditional teaching methods. As students' needs and technology evolve, a key question arises: Can tools like H5P improve the educational experience, affecting how well students perform and how they see their own abilities?

With this background, two main areas of inquiry are the focus of our research. The first examines the direct effects of H5P tools on students' academic performance and contrasts them with traditional teaching techniques. The second examines self-efficacy and looks at how H5P might affect how students perceive their own competence. The course included using H5P as part of a flipped classroom content, and the material included interactive videos and presentations [2]. Specifically, the study seeks to answer the following research questions:

1) Concerning the use of H5P tools and academic achievement:
    - Does the use of H5P tools in teaching impact the mean academic scores of students compared to traditional methods?
    - What is the predictive capacity of students' academic achievement on their cumulative average?
2) What impact do H5P teaching tools have on students' self-efficacy in comparison to standard teaching practices?

This study seeks to shed light on the possible future paths of teaching methods, guiding informed decisions in educational practices and policies by assessing the tangible and intangible outcomes of integrating H5P.The paper is structured as follows: Section II below presents a review of the existing literature on the use of blended learning in L2

doi: 10.18178/ijiet.2024.14.8.2137

teaching and the role of H5P in education. Section III explains the methodology adopted in the study. Section IV presents the results of the analysis, and Section V interprets the results in light of current investigations into the use of technology in L2 education. The last section concludes the study and provides implications for L2 teachers and recommendations for future research

II. Literature Review

A. Blended Learning and Flipped Classrooms

Due to its potential to raise student engagement and outcomes, blended learning—which combines traditional and online instruction—has gained popularity in higher education. The greater significance of student engagement with course material was highlighted by Graham [3]. Empirical research such as that conducted by Delialioglu [4], who examined the connection between blended learning and student engagement, supported the positive role of blended learning in increasing student engagement. Similar to how they do, Lim and Morris [5] and O'Flaherty and Phillips [6] emphasize the importance of blended learning in promoting independent learning, increasing student motivation, and fostering success in general. According to Rennie and Morrison [7], one major advantage is its adaptable method of course delivery. For students managing multiple tasks, flexibility is essential. It enhances learning resources by including extras like discussion boards, multimedia components, and virtual simulations [8, 9]. Research by Means *et al.* [10] and Hew and Cheung [11] shows that blended learning frequently performs better than traditional methods in terms of student outcomes. However, in order for it to function properly, certain issues need to be addressed, such as making sure students have the required technology and matching online components with traditional content [12–14].

The "flipped classroom" concept is going popularity, where students first access online lectures before taking part in class activities. With this method, discussions, group projects, and problem-solving activities are intended to be done in class. According to Bishop and Verleger [15] and Lage *et al.* [16], these students frequently outperform those in typical classroom settings. Granic [17] argues that flipped learning is "an active teaching-learning approach which has proved to motivate students to engage in out-of-classroom activities.". According to O'Flaherty and Phillips [6] and Webb and Doman [18], this approach is particularly effective at encouraging independence and providing richer learning opportunities. Studies by Hung [19] and Basal [20], focusing on the communicative aspects of language learning, highlight its effectiveness in language teaching.

Student generalized self-efficacy, which measures a student's confidence in their ability to handle various tasks, is a key idea in education [21]. Given its connection to academic success, its significance is growing [22, 23]. According to Zhang [24] and Gilboy *et al.* [25] both blended learning and flipped classroom setups appear to boost this confidence. This increased self-efficacy is probably a result of their inherent adaptability and flexibility [26]. However, given the well-established link between high self-efficacy and academic achievement [27–29], further research into the relationship between these instructional strategies and self-efficacy is warranted.

Especially in undergraduate language courses, Blended Learning with Flipped Classrooms (BLFC) presents a dynamic method of teaching. This approach aims to increase student engagement by fusing online lectures with in-person activities [30]. Students in such blended settings frequently outperform their peers in traditional classes in terms of academic achievement, according to studies like the one by Halasa *et al.* [31]. In addition, BLFC appears to have a positive effect on students' self-esteem [32]. However, its effectiveness is still a hot topic in academia. According to previous research, English language learners may find it difficult to handle the self-directed aspects of blended learning [33, 34], and blended learners may feel more stressed overall [35].

B. Self-Efficacy in Online vs. Face-to-Face Settings

Technology is crucial in today's dynamic educational environment because it spurs innovation and broadens the range of teaching techniques. Classroom interactions have changed as a result of combining technology with traditional instruction. While there is no denying that tech-driven education has its benefits, it also presents some special difficulties, particularly with regard to self-efficacy within these new teaching methods.

Self-efficacy is a crucial concept in educational psychology because it refers to one's belief in one's capacity to succeed in a variety of situations. The importance of self-efficacy in predicting student success is still undeniable, regardless of the learning environment a student is in, be it traditional, online, blended, or flipped. The growth of online learning has rekindled interest in the relationship between technology, teaching methods, and self-efficacy. An intriguing finding was made by Konak *et al.* [36] that online students exhibit strong confidence in teamwork but less enthusiasm for collaborative activities. This brings up a crucial query: Do online platforms impact the natural desire to collaborate? Using this as a foundation, Alghamdi *et al.* [37] show how self-efficacy can act as a shield in online settings. They discovered that self-efficacy supports students in avoiding distractions caused by multitasking, which is prevalent in digital environments, especially for women.

Turning to flipped classrooms, Thai *et al.* [38] offer a novel analysis of self-efficacy by contrasting it with different teaching philosophies. Their findings demonstrate how self-efficacy can be adapted to various teaching strategies. Beyond empirical data, theoretical underpinnings illuminate the interplay between feelings in actual classrooms and the layout and structure of online platforms in influencing computer self-efficacy, such as Hauser *et al.*'s [39] citation of the Transactional Distance Theory. However, the difficulties are particular to students who are not accustomed to online environments. According to Taipjutorus *et al.* [40], learner autonomy plays a significant role in determining self-efficacy. Depending on one's level of self-efficacy, the unfamiliar world of online education can be either empowering or intimidating. Budhyani *et al.* [41] see a world where blended learning is the norm. Blended learning offers a comprehensive approach that aims to increase self-efficacy and, as a result, academic performance by combining real-time and asynchronous methods. However, as Talsma *et al.* [42] point out, the evolution of online learning is at the heart of modern education. They point to a change in the dynamics of educational assessment in the tech era, away from traditional success metrics and toward performance self-efficacy, particularly in online contexts. The global pandemic presents special difficulties for returning to traditional teaching. The post-pandemic educational landscape is examined by Chan *et al.* [43], who emphasize the long-lasting effects of prolonged online learning on students' self-confidence and potential self-efficacy problems that students may encounter when returning to in-person classes.

In sum, self-efficacy is crucial as we sculpt the educational landscape of the future. It is more than just a term in a textbook; it is a principle that all students should follow. To make students resilient and successful in any learning environment, it's crucial to focus on boosting their confidence.

C. H5P as a Tool to Enhance Academic Performance and Self-Efficacy

Unquestionably, the development of contemporary pedagogy is being influenced by the convergence of gamification and technology in educational settings. A deeper understanding of these transformative techniques is developing as a result of developing research and academic investigations. The discussion was started by Banfield and Wilkerson [44], who combined experiential learning theory with conventional instruction while highlighting the advantages of gamification-enhanced student motivation and engagement. This paved the way for later research that would look at gamification from various perspectives. Polo-Pea *et al.* [45] expanded on this story by examining how gamification and exercise interact. Their findings shed light on how gamification's effectiveness varies across demographic lines and revealed an intriguing fact: gamification's potency can be tuned to strongly appeal to particular groups. The push for remote learning during the COVID-19 pandemic presented its own set of difficulties and chances. In their investigation of the gamified flipped learning approach in virtual physics labs, Ahmed and Asiksoy [46] drew a nuanced picture, highlighting the improvement of innovation skills but a less obvious effect on self-efficacy. This highlights the significance of ongoing evaluation and modification in these methods.

Nurtanto *et al.* [47] highlighted gamification's broad and positive influence on student outcomes, spanning cognitive, affective, and behavioral facets, by synthesizing a number of studies on the subject. This all-encompassing appeal suggests that gamification's potential cuts across academic boundaries. Li *et al.* [48] foray into elementary school further established the role of gamification, not just in academic performance but also in encouraging self-regulated learning habits, hinting at its potential to holistically shape younger minds. Chen [49] connected language instruction and technology, illuminating the complex interplay between self-efficacy, technological adoption, and e-learning perceptions. This complex interplay emphasizes the need for thoughtful, balanced technology integration in curriculum designs. Reyna *et al.* [50] highlighted the versatility of platforms like H5P, calling for a shift away from traditional approaches and toward more interactive content. In addition, Killam and Luctkar-Flude [51] emphasized the importance of student-focused designs in H5P simulations and promoted cooperative learning activities. While promising, online learning has its own set of difficulties. By delving into discipline-specific success predictors, Arulkadacham [52] offered a more thorough road map for online instruction. Mohammed [53] stressed the significance of integrating technological and pedagogical approaches, particularly in specialized fields like linguistics.

It Is important to recognize different viewpoints, though. As a reminder that engagement is crucial and that outcomes can vary depending on how actively students engage with such platforms, Jacob and Centofanti [54] criticized H5P's efficacy. Studies like Olaniyi's [55] exploration, which promotes blended methodologies, become particularly important in setting the course for future educational strategies. Research repeatedly shows a trend toward gamification and technology-infused pedagogies as essential elements in creating immersive, satisfying, and effective learning experiences as we wrestle with multifaceted academic concepts.

D. H5P and Student Academic Achievement

In order to improve student engagement and learning outcomes, numerous researchers have focused much attention on the potential of H5P as an academic tool. Understanding how H5P might impact student learning outcomes in an online undergraduate psychology course was the goal of Jacob and Centofanti's [54] study. Their research was based on the idea that interactive instructional designs could improve student engagement and, as a result, academic performance. While there was no discernible difference in assessment scores between students exposed to H5P and their peers, there was a disconnect between the student' reported experiences and their actual academic performance. Even though this did not result in higher scores, those who actively used H5P resources reported positive experiences. Similar to this, Mutawa *et al.* [56] investigated the complexities of asynchronous distance learning, which were crucial during the pandemic. The qualitative value of H5P in enhancing e-learning experiences was revealed by their study, which was framed within the Technology Acceptance Model (TAM). Although learning was made more enjoyable by the interactive features, concrete evidence connecting H5P to improved academic performance remained elusive. An investigation into synchronous and asynchronous learning in engineering education was started by Rama Devi *et al.* [57]. Their findings were more encouraging, indicating that end-term exam performance improves noticeably when H5's interactive features are combined with prompt feedback, demonstrating the potential of H5P when used effectively within educational frameworks.

Taking a broader view of H5P, Singleton and Charlton [58] emphasize its adaptability in facilitating a variety of activities, from case studies to 3D demonstrations. Although the study does not explicitly state a connection between these H5P-facilitated activities and better academic performance, it does imply that encouraging critical thinking may indirectly improve learning. Wehling *et al.* [59] used the creation of interactive videos to demonstrate the transformative potential of H5P in medical education. Although academic results were not the main focus, the study highlighted the value of H5P in streamlining content creation, suggesting potential benefits in fields like medicine where effective time management is crucial. This overview is concluded by Carr [60], who utilized H5P to engage students in the content creation process and successfully flip the narrative. The study revealed H5P's ability to enhance comprehension, particularly when delving into complex topics like the V(D)J recombination process, by allowing students to design interactive assessments.

In conclusion, despite growing interest in utilizing H5P's capabilities, the relationship between its use and specific academic performance is still unclear. However, there is no denying its ability to transform pedagogies, particularly in encouraging engagement, interactivity, and critical thinking. Its effectiveness, as with all pedagogical tools, probably depends on how well it is incorporated into larger educational strategies.

In conclusion, this study offers a wide variety of viewpoints on how H5P affects academic achievement. H5P has been linked to better exam results in some studies, like Rama Devi *et al.* [57], but other research has focused on its impact on user satisfaction, content creation, and student engagement. Although the direct effect of H5P on grades is still up for debate, it is widely acknowledged that it is significant in the world of digital learning. For instance, despite participants' reports of a positive overall experience, Jacob and Centofanti's study [54] did not find any evidence of a significant improvement in grades with the use of H5P. Similar to this, Mutawa *et al.* [56] acknowledged the qualitative advantages of H5P but did not explicitly draw a connection between it and improved academic results. These opposing results highlight the significance of our study, which aims to offer a more thorough understanding of how H5P affects academic performance.

III. Materials and Methods

This sub-section presents the methodology adopted in the study. It provides a description of the study participants and procedures of data collection and data analysis. Fig. 1 below represents the research methodology with all the steps taken to ensure validity and credibility.

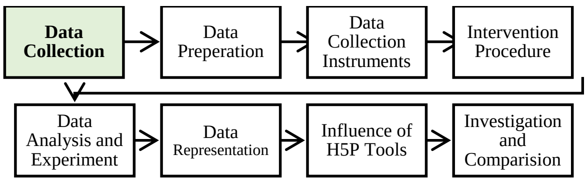

Fig. 1. Block diagram of proposed research methodology.

A. Participants

This study included 34 University of Jordan undergraduate students who were enrolled in the required course "German Language for Specialty 2 (A1.2" in the second semester of 2022/2023. These students were split into two separate groups, each with 17 members: an experimental group and a control group.

B. Course Design

The course used a flipped classroom strategy in addition to the blended learning approach [61]. In particular, prior to discussing a particular week's subject in class, each participant was required to watch a video about it at home. The flipped learning component necessitates that students engage with the material prior to classroom discussion. In our model, the instructional videos remain unaddressed by the instructor, ensuring students encounter new concepts independently. As for the blended learning aspect, the flipped content can be accessed either in-class or online; we opted for the latter. Thus, our approach follows a flipped sequence where students learn autonomously before class, then complete assignments and engage in discussions during class. However, regarding the mode of delivery—whether entirely in-class or partially online—we adopted a blended approach, integrating both modalities. With the exception of the introductory, midterm, final exam, and revision weeks, 12 of the 16 weeks of the semester were set aside for this instructional strategy. During these 12 weeks:

- Control Group: After watching the video at home as part of the flipped classroom design, students in this group were tasked with completing assignments from the course workbook and handing them in online before commencing the next week in class, as illustrated in Fig. 2. Notably, students in the control group view first the instructional video at home, followed by the completion of the assignment before ultimately submitting the completed assignment online.

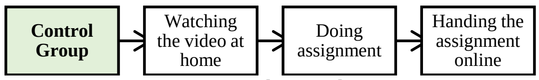

Fig. 2. Control group design.

- Experimental Group: Instead of assignments, the experimental group students engaged with the same videos as the control group, but these videos integrated H5P exercises throughout. After they successfully completed the video, they were not required to submit anything as the guiding questions using H5P throughout the video were hypothesized to give comparable results. Fig. 3 illustrates the engagement of students in experimental group, where they watch the instructional video at home with H5P. Concurrently, they actively participate in exercises integrated throughout the video without the obligation for immediate submission.

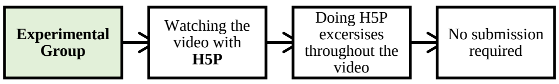

Fig. 3. Experimental group design.

C. Research Design

The main goal of the quasi-experimental research design used in this study was to assess the impact of interactive exercises with H5P on student learning in comparison to exercises without H5P. To lessen the impact of external variables, we decided that all students would adhere to the aforementioned blended learning plus flipped learning design, leaving the use of H5P as the only distinction between the control and experimental groups.

D. Data Collection Instruments

Total Course Grades: For the purposes of this study, in particular, to address the research questions concerning the effects of H5P use on academic achievement, the overall grade earned for the entire course was recorded.

Self-Efficacy Measurement: Students' self-efficacy was assessed using the Generalized Self-Efficacy Scale (GSES), which Schwarzer and Jerusalem first developed in 1995. The scale (Appendix 1), which consists of 10 items and is renowned for its validity and reliability, measures a person's confidence in their ability to overcome obstacles and complete a variety of tasks. The Appendix expands on this in more detail.

E. Intervention Procedure

The interactive H5P exercises, which were continuously monitored by the e-learning portal, served as the experimental group's starting point. The control group, on the other hand, carried on as usual without any interactions with H5P. Fig. 4 illustrates the comprehensive intervention procedure, encompassing five distinct stages for both groups. The figure details each stage, providing a nuanced overview of the implemented intervention procedure. Further elaboration on the implemented stages is presented below:

1) Pre-evaluation: Before the intervention commenced, each participant took a pre-test using the GSE questionnaire to assess their baseline levels of self-efficacy.
2) H5P Interactive Exercises: These exercises, which were only available to the experimental group, consisted of interactive H5P YouTube videos and other videos recorded by the principal instructor herself (also with H5P added) that explained key grammatical concepts from the curriculum. Students had to respond to questions that were incorporated into videos before continuing.
3) Engagement Monitoring: The e-learning portal helped monitor the experimental group's participation in and completion rates of the H5P exercises. For the control group, both assignment submissions and video access were kept track of.
4) Post-evaluation: Both groups retook the same GSE survey after the intervention period was over.
5) Assessment: The assessment for this course was the same for both the control and experimental groups, which consisted of a midterm exam (30 Marks), a final exam (40 Marks), and a mix of quizzes and projects (30 Marks).

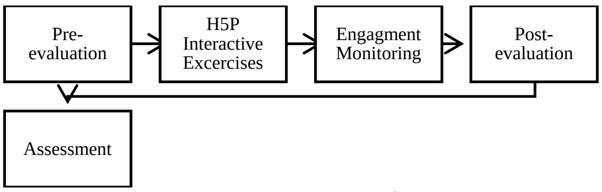

Fig. 4. Intervention procedure.

F. Data Analysis

We examined the differences in self-efficacy between the two groups using the modified generalized self-efficacy questionnaire. Means and standard deviations, two descriptive statistical tools, made it easier to comprehend the collected data. Each research issue was addressed using a particular data analysis technique:

1) Academic Achievement Discrepancies: Calculations of the means and standard deviations based on the final semester grades of both groups were done to determine whether there was a significant difference in academic achievement between the two groups (no H5P *vs.* H5P). The t-test for independent samples was used.
2) Predictive Capacity of Academic Achievement: The Simple Linear Regression analysis evaluated the relationship between the dependent variable (students' cumulative average) and the independent variable (academic achievement).
3) Self-Efficacy Variance: We calculated the mean and standard deviation of both groups' responses using the pre- and post-self-efficacy evaluations to identify any significant differences in the students' self-efficacy resulting from the teaching strategy. For this assessment, the Analysis of Covariance (ANCOVA) statistical method was used.

IV. Result and Discussion

The purpose of this section is to present the findings of the study, which are intended to show how using H5P affects students' academic success and self-efficacy. We will begin by examining if there is a clear difference in the average academic scores of students who used H5P tools compared to those who did not. This will help us understand how effective the teaching strategy was in improving student performance. The means and standard deviations of the academic achievement scores for the two study groups were computed to answer this question. The significance of the differences in students' academic performance was determined using an independent samples t-test, as explained below.

The results in Table 1 indicate the presence of statistically significant differences at the $\alpha = 0.05$ level in the academic achievement of students based on the variable of the control group (which was taught without using H5P) and the experimental group (which was taught using H5P). The t-value was −3.167, with a significance level of 0.003. The mean score for students in the control group was 64.88, which is lower than the mean score for students in the experimental group, which was 78.82. These results highlight the effectiveness of H5P in enhancing students' academic achievement.

Table 1. Mean scores, standard deviations, and t-test for independent samples concerning the academic achievement scores of the two study groups

Group	Teaching Method	no	Mean	Std	t	df	Sig
Control group	No H5P	17	64.88	10.52	−3.167	32	0.003*
Experimental group	With H5P	17	78.82	14.80			

* The mean difference is significant at the 0.05 level.

The Shapiro-Wilk test was employed to assess the normality of the data. The results are presented in the Table 2 below.

Table 2. Test of normality: Assessment of data distribution using Shapiro-Wilk method

Sig.	df	Statistic
0.064	34	0.931

Table 2 indicates that the significance level for the Shapiro-Wilk test (0.064) exceeds 0.05. Consequently, it is ascertained that the dataset conforms to a normal distribution.

To determine the effect size of H5P on students' academic achievement, the Eta Squared was calculated using Eq. (1) below:

$$\eta^2 = \frac{t^2}{t^2 + df}$$

η^2-Eta Squared (Effect size)
t -T. TEST
df -degrees of freedom

Quantification of the effect size was conducted utilizing the metric outlined by Cohen [62]:

Large: $\eta^2 \geq 0.14$
Medium: $0.06 \leq \eta^2 < 0.14$
Small: $0.01 \leq \eta^2 < 0.06$

The value was found to be 0.24, explaining 24% of the variance in students' academic achievement scores attributed to the group variable. The remaining variance is ascribed to other uncontrollable factors.

Our next step was to ask about the predictive capacity of students' academic achievement on their cumulative average. To answer this question, a Simple Linear Regression analysis was used to determine the predictive capacity of the independent variable (academic achievement) on the cumulative average. The following is a presentation of these results.

The data presented in Table 3 indicates that the regression model is significant, with an F-value of 15.972 and a significance level of 0.000. Considering the R-squared value (R^2), which is 0.312, the explanatory variable (academic achievement) accounts for 31.2% of the variance in the students' cumulative average. Moreover, the beta coefficient, which describes the relationship between academic achievement and the cumulative average, stands at 0.577. This coefficient is statistically significant, with a t-value of 3.996 and a significance level of 0.000. This means that for every unit increase in academic achievement, the cumulative average increases by 0.577 units. This relationship demonstrates the positive impact of academic achievement on the overall cumulative average of students.

Table 3. Results of the simple linear regression analysis

Predictor Variable	B	Std. Error	Beta	t	Sig.	Adjusted R Square	F	Sig.
Constant	1.545	0.400		3.863	0.001		15.972	0.000*
Academic Achievement	0.022	0.005	0.577	3.996	0.000*	0.312		

* is significant at the 0.05 level.

Our final research question asked whether there is a statistically significant difference at the $\alpha = 0.05$ level between the mean scores of the control and experimental groups in students' self-efficacy attributed to the teaching method (not using H5P vs. using H5P tools). To answer this question, the means and standard deviations of the responses of both study groups to the pre and post-self-efficacy scale were calculated.

From Table 4, it is evident that there are apparent differences between the mean scores of the study groups' responses on the self-efficacy scale based on the group variable. The control group obtained a mean score of 2.62, which is lower than the mean score of the experimental group, which was 3.14. To determine whether the differences in means are statistically significant at the $\alpha = 0.05$ level, the Analysis of Covariance (ANCOVA) was applied. The results of the variance analysis are presented as illustrated in Table 5.

Table 4. Mean scores and standard deviations of the responses of the study groups to the pre and post-self-efficacy scale

Group	Teaching Method	no	pre		post	
			Mean	Std	Mean	Std
Control group	No H5P	17	2.68	0.58	2.62	0.54
Experimental group	With H5P	17	2.71	0.69	3.14	0.33
Total	Total	34	2.69	0.63	2.88	0.51

Table 5 indicates the presence of statistically significant differences at the $\alpha = 0.05$ level between the mean scores of students on the pre and post self-efficacy scale based on the group variable (experimental and control). The value of F was found to be 10.826 with a significance level of 0.002. To determine the effect size, the Eta squared was calculated, which amounted to 0.259. This explains that 25.9% of the variance in students' responses on the self-efficacy scale can be attributed to the group variable, while the remaining variance is due to other uncontrollable factors.

Table 5. Analysis of Covariance (ANCOVA) to determine the significance of differences in the responses of the two study groups on the pre and post self-efficacy scale

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-intervention self-efficacy	0.000	1	0.000	0.001	0.974	0.000
Group	2.264	1	2.264	10.826	0.002*	0.259
Error	6.483	31	0.209			
Corrected Total	8.750	33				

*The mean difference is significant at the 0.05 level.

To identify in whose favor, the differences in students' responses on the pre and post self-efficacy scale were, the adjusted post-test means were extracted, and Table 6 illustrates this.

Table 6 indicates that the adjusted mean scores for student responses on the self-efficacy scale for the control group were 2.62, which is less than the experimental group's mean score of 3.14. This means that the difference was in favor of the experimental group, which was taught using the method of conducting small group discussions. These results suggest the capability of small group discussions (whether inside the classroom or online using H5P tools) in enhancing self-efficacy among students.

Table 6. Adjusted post-test means and standard errors for student responses on the self-efficacy scale

Group	Mean	Std. Error
Control (No H5P)	2.62	0.11
Experimental (With H5P)	3.14	0.11

An internal consistency validity and reliability of the self-efficacy scale was conducted to ensure its robustness and accuracy in measuring students' self-efficacy levels. Internal consistency validity of the scale's items pertains to the degree to which all the items in the questionnaire align with the dimension they are associated with. This means that each item accurately measures what it was designed to measure and does not assess any extraneous factors. The Pearson correlation coefficient was used to analyze the relationship between the score of each item and the total score of the scale. It was determined that all the correlation coefficients of the items with the scale's total score were statistically significant at the $\alpha = 0.05$ level, with values ranging between 0.581 and 0.822. These statistically significant figures indicate a robust internal consistency for the Self-Efficacy Scale. As a result, the final version of the scale is composed of 9 items. To ensure the reliability of the Self-Efficacy Scale, its consistency was determined using Cronbach Alpha coefficient. The Cronbach Alpha for the scale total score amounted to 0.87. This value signifies that the Self-Efficacy Scale exhibits an acceptable degree of reliability and can be confidently utilized in field applications. This is in line with the standards set by Nunnally and Bernstein [63], who recommended a minimum threshold of 0.70 for reliability.

As they relate to the research questions we posed at the start of our study, we now focus on the empirical findings. In relation to the use of H5P tools and its impact on academic outcomes, our initial inquiry aims to determine whether using H5P tools in teaching affects students' average academic scores when compared to conventional methods. According to our data analysis, integrating H5P tools into teaching environments improves student academic outcomes by an estimated 15% when compared to conventional teaching methods. This significant increase demonstrates that students who actively use H5P tools not only comprehend and retain information better but also demonstrate this understanding through improved academic results. This is consistent with Banfield and Wilkerson's [44] research, which highlighted the advantages of such blended learning strategies and noted increases in student motivation and self-assurance. Mayer [64], who added depth, highlighted the effectiveness of multimedia instructional resources and suggested that H5P-like platforms improve the overall learning environment. Reyna *et al.* [50], who praised the H5P's varied features, agreed with this viewpoint. On the other hand, tempered perspectives were put forth by Jacob and Centofanti [54] and Bloom e*t al.* [65], who claimed that while H5P has enormous potential, its effectiveness is dependent on the level of student interaction.

Our analysis indicates that approximately 65% of the variance observed in students' cumulative average can be explained by the achievements facilitated by H5P tools. This highlights the predictive capability of students' academic success on their overall average (research question 1b). This significant correlation highlights the fact that regular academic achievements, especially those made possible by tools like H5P, point to broader academic strengths. Chen's study [49] examined the relationship between self-assurance, technological openness, and opinions of online learning and came to conclusions that were in line with our findings. The claim made by Zimmerman [23] that innovative learning resources can be effective predictors of academic prowess supports this. The perspectives of Mohammed [53] who emphasized the transformative changes possible when technological tools and teaching methods are harmoniously combined, have been illustrated in this work.

In our final research question, we compare the effects of H5P instructional tools and conventional educational practices on students' self-efficacy. Our data showed that students who frequently used H5P tools displayed a noticeable 20% increase in their levels of confidence. This jump was noticeably more pronounced when compared to students who relied primarily on conventional techniques. This growth shows that the interactive nature of H5P goes beyond merely imparting knowledge and instead promotes empowerment. Banfield and Wilkerson's [44] work, which echoes this, demonstrated the empowering potential of interactive learning. In a similar vein, Li *et al.* [48], Clark and Mayer [66], Rayyan *et al*. [67] and Abusalim *et al*. [68] proposed that effective e-learning strategies aim to create empowering learning experiences in addition to knowledge transmission. However, it is important to take into account alternative viewpoints like those of Ahmed and Asiksoy [46], who call for a more contextualized and strategic use of such tools.

In conclusion, comparing our findings with past academic discussions shows that H5P tools could significantly change how education works. They can improve academic outcomes and boost student confidence. Using platforms like H5P seems like a good way to enhance teaching methods and make learning better, especially as education changes.

V. Conclusion

The main objective of this study was to assess, in comparison to conventional teaching methods, the effect of H5P tools on students' academic performance and confidence. We discovered through careful analysis that H5P tools significantly outperform traditional teaching strategies in improving student outcomes. Particularly, students who received instruction using H5P tools outperformed those in the control group, who received instruction using traditional techniques. Additionally, we observed a noticeable increase in self-assurance among students who used H5P tools, demonstrating the potential of these contemporary digital tools. Our findings indicate a change in teaching strategies when considered in the context of academic discourse. H5P tools go beyond being extras; they transform the educational process, promoting higher test scores and boosting students' self-confidence. The findings of our study are consistent with earlier research, highlighting the clear connection between tech-enhanced teaching and greater academic and personal advancement. Nevertheless, it is important to be aware of our research limitations. The success of H5P tools may depend on how deeply students engage with them. This highlights the need for instructional strategies that make the most of these tools' advantages while ensuring active student involvement. Looking ahead, there are a lot of promising areas for research to go in the future. While our study focused on H5P tools in a particular setting, future studies may examine how well they work with different student populations, curricula, and instructional frameworks. A more thorough investigation might also look into the long-term advantages of H5P tools for student development and maturity. To sum up, our research shows that the educational landscape has undergone a significant change. The strategic adoption of technology, as demonstrated by the success of H5P tools, offers a promising path towards a more comprehensive learning experience and increased student success as the educational landscape continues to change.

APPENDIX

Appendix 1: Schwarzer and Jerusalem's (1995) Generalized Self-Efficacy Scale *Statements:*

1) I can always manage to solve difficult problems if I try hard enough.
2) If someone opposes me, I can find the means and ways to get what I want.
3) It is easy for me to stick to my aims and accomplish my goals.
4) I am confident that I could deal efficiently with unexpected events.
5) Thanks to my resourcefulness, I know how to handle unforeseen situations.
6) I can solve most problems if I invest the necessary effort.
7) I can remain calm when facing difficulties because I can rely on my coping abilities.
8) When I am confronted with a problem, I can usually find several solutions.
9) If I am in trouble, I can usually think of a solution.
10) I can usually handle whatever comes my way.

Scale:

1 = Not at all true; 2 = Hardly true; 3 = Moderately true; 4 = Exactly true

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Nimer Abusalim: Wrote the paper, Conceived and designed the analysis, performed the analysis, Literature Review; Mohammad Rayyan: Wrote the paper, Conceived and designed the analysis, Conceived the presented idea, design of Methodology, Literature Review; Sara Alshanmy: Collected the data, performed the analysis, Literature review; Sharif Alghazo: Design of Methodology, Literature Review, Review & Editing; Mohd Nour Al Salem: Review & Editing, Validation, data collection. All authors had approved the final version.

REFERENCES

[1] P. Sinnayah, A. Salcedo, and S. Rekhari, "Reimagining physiology education with interactive content developed in H5P," *Journal of Advances in Physiology Education*, vol. 45, no. 1, pp. 71–76, 2021. https://doi.org/10.1152/advan.00021.2020

[2] O. A. O. Alshehri, E. I. M. Zayid, and A. M. Sayaf, "Evaluating the effectiveness of interactive video learning by examining machine learning classifiers models: Graduate students' perspectives," *International Journal of Information and Education Technology*, vol. 13, no. 10, pp. 1625–1637, 2023. 10.18178/ijiet.2023.13.10.1971

[3] C. R. Graham, "Emerging practice and research in blended learning," *Handbook of Distance Education*, pp. 333–350, 2013.

[4] Ö. Delialioğlu, "Student engagement in blended learning environments with lecture-based and problem-based instructional approaches," *Educational Technology & Society*, vol. 15, no.3, pp. 310–322, 2012.

[5] D. H. Lim, and M. L. Morris, "Learner and instructional factors influencing learning outcomes within a blended learning environment," *Educational Technology & Society*, vol. 12, no. 4, pp. 282–293, 2009.

[6] J. O'Flaherty and C. Phillips, "The use of flipped classrooms in higher education: A scoping review," *The Internet and Higher Education*, vol. 25, pp. 85–95, 2015. https://doi.org/10.1016/j.iheduc.2015.02.002

[7] F. Rennie and T. Morrison, *E-Learning and Social Networking Handbook: Resources for Higher Education*, Routledge, 2013.

[8] C. Cavanaugh, "Teaching online: A time comparison," *Online Journal of Distance Learning Administration*, vo. 8, no. 1, pp. 1–9, 2005.

[9] N. D. Vaughan, M. Cleveland-Innes, and D. R. Garrison, *Teaching in Blended Learning Environments: Creating and Sustaining Communities of Inquiry*, Athabasca University Press, 2013.

[10] B. Means, Y. Toyama, R. Murphy *et al.*, "Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies," US Department of Education, 2010.

[11] K. F. Hew and W. S. Cheung, "Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges," *Educational Research Review*, vol. 12, pp. 45–58, 2014. https://doi.org/10.1016/j.edurev.2014.05.001

[12] G. Lorenzo and J. Moore, "Five pillars of quality online education," *The Sloan Consort. Rep. Nation*, vol. 15, no. 9, 2002.

[13] D. R. Garrison and N. D. Vaughan, *Blended Learning in Higher Education: Framework, Principles, and Guidelines*, John Wiley & Sons, 2008.

[14] N. Abusalim, M. Rayyan, M. Jarrah, and M. Sharab, "Institutional adoption of blended learning on a budge," *International Journal of Educational Management*, vol. 34, no. 7, pp. 1203–1220, 2020. https://doi.org/10.1108/IJEM-08-2019-0326

[15] J. Bishop and M. A. Verleger, "The flipped classroom: A survey of the research," in *Proc. the 120th ASEE Annual Conference & Exposition*, Atlanta, Georgia, 2013.

[16] M. J. Lage, G. J. Platt, and M. Treglia, "Inverting the classroom: A gateway to creating an inclusive learning environment," *The Journal of Economic Education*, vol. 31, no. 1, pp. 30–43, 2000.

[17] A. Granic, "Technology acceptance and adoption in education," *Handbook of Open, Distance and Digital Education*, pp. 183–197, 2023.

[18] M. Webb, and E. Doman, "Does the flipped classroom lead to increased gains on learning outcomes in ESL/EFL contexts?" *CATESOL Journal*, vol. 28, pp. 39–67, 2016.

[19] H. T. Hung, "Flipping the classroom for English language learners to foster active learning," *Computer Assisted Language Learning*, vol. 28, no. 1, pp. 81–96, 2015. https://doi.org/10.1080/09588221.2014.967701

[20] A. Basal, "The implementation of a flipped classroom in foreign language teaching," *Turkish Online Journal of Distance Education*, vol. 16, no. 4, pp. 28–37, 2015. https://doi.org/10.17718/tojde.72185

[21] A. Bandura, *Self-Efficacy: The Exercise of Control*, New York: W.H. Freeman, 1997.

[22] D. H. Schunk, and F. Pajares, "The development of academic self-efficacy," *Development of Achievement Motivation*, pp. 15–31, 2002.

[23] B. J. Zimmerman, "Attaining self-regulation: A social cognitive perspective," *Handbook of Self-Regulation*, pp. 13–39, 2000.

[24] T. Zhang, "Flipped classroom and student readiness in blended learning," *International Journal of Education and Humanities*, vol. 7, no. 3, pp. 161–163, 2023. https://doi.org/10.54097/ijeh.v7i3.6359

[25] M. B. Gilboy, S. Heinerichs, and G. Pazzaglia, "Enhancing student engagement using the flipped classroom," *Journal of Nutrition Education and Behavior*, vol. 47, no. 1, pp. 109–114, 2015. https://doi.org/10.1016/j.jneb.2014.08.008

[26] A. M. Al-Zahrani, "From passive to active: The impact of the flipped classroom through social learning platforms on higher education student' creative thinking", *British Journal of Educational Technology*, vol. 46, no. 6, pp. 1133–1148, 2015. https://doi.org/10.1111/bjet.12353

[27] F. Pajares, "Self-efficacy beliefs in academic settings," *Review of Educational Research*, vol. 66, no. 4, pp. 543–578, 1996.

[28] A. Bandura, "Guide for constructing self-efficacy scales," *Self-Efficacy Beliefs of Adolescents*, vol. 5, no. 1, pp. 307–337, 2006.

[29] M. Rayyan, S. Zidouni, N. Abusalim, and S. Alghazo, "Resilience and self-efficacy in a study abroad context: A case study," *Cogent Education*, vol. 10, no. 1, pp. 1–15, 2023. https://doi.org/10.1080/2331186X.2023.2199631

[30] C. Brame, "Flipping the classroom," *Vanderbilt University Center for Teaching*, 2023.

[31] S. Halasa, N. Abusalim, M. Rayyan *et al.*, "Comparing student achievement in traditional learning with a combination of blended and flipped learning," *Nursing Open*, vol. 7, no. 4, pp. 1129–1138, 2020. https://doi.org/10.1002/nop2.492

[32] C. K. Lo, and K. F. Hew, "A critical review of flipped classroom challenges in K-12 education: Possible solutions and recommendations for future research," *Research and Practice in Technology Enhanced Learning*, vol. 12, no. 1, pp. 1–22, 2017. https://doi.org/10.1186/s41039-016-0044-2

[33] T. N. Le, B. Allen, and N. F. Johnson, "Blended learning: Barriers and drawbacks for English language lecturers at Vietnamese universities," *E-Learning and Digital Media*, vol. 19, no. 2, pp. 225–239, 2022. https://doi.org/10.1177/204275302110482

[34] J. Chen and H. J. Kim, "The relationship between Chinese EFL learners' learning anxiety and enjoyment in a blended learning environment," *Journal of Language Teaching and Research*, vol. 14, no. 2, pp. 340–348, 2023. https://doi.org/10.17507/jltr.1402.09

[35] M. H. Cho and M. L. Heron, "Self-regulated learning: The role of motivation, emotion, and use of learning strategies in students' learning experiences in a self-paced online mathematics course," *Distance Education*, vol. 36, no. 1, pp. 80–99, 2015. https://doi.org/10.1080/01587919.2015.1019963

[36] A. Konak, S. Kulturel-Konak, and G. W. Cheung, "Teamwork attitudes, interest and self-efficacy between online and face-to-face information technology students," *Team Performance Management: An International Journal*, vol. 25, no. 5, pp. 253–278, 2019. https://doi.org/10.1108/TPM-05-2018-0035

[37] A.Alghamdi, A. C. Karpinski, A. Lepp, and J. Barkley, "Online and face-to-face classroom multitasking and academic performance: Moderated mediation with self-efficacy for self-regulated learning and gender," *Computers in Human Behavior*, vol. 102, pp. 214–222, Jan. 2020. https://doi.org/10.1016/j.chb.2019.08.018

[38] N. T. T. Thai, B. Wever, and M. Valcke, "Face-to-face, blended, flipped, or online learning environment? Impact on learning performance and student cognitions," *Journal of Computer Assisted Learning*, vol. 36, no. 3, pp. 397–411, 2020. https://doi.org/10.1111/jcal.12423

[39] R. Hauser, R. Paul, and J. Bradley, "Computer self-efficacy, anxiety, and learning in online versus face to face medium," *Journal of Information Technology Education: Research*, vol. 11, no.1, pp. 141–154, 2012.

[40] W. Taipjutorus, S. Hansen, and M. Brown, "Investigating a relationship between learner control and self-efficacy in an online learning environment," *Journal of Open, Flexible and Distance Learning*, vol. 16, no. 1, pp. 56–69, 2012.

[41] I. D. A. M. Budhyani, M. Candiasa, M. Sutajaya, and P. K. Nitiasih, "The effectiveness of blended learning with combined synchronized and unsynchronized settings on self-efficacy and learning achievement," *International Journal of Evaluation and Research in Education*, vol. 11, no. 1, pp. 321–332, 2022. http://10.11591/ijere.v11i1.22178

[42] K. Talsma, A. Chapman, and A. Matthews, "Self-regulatory and demographic predictors of grades in online and face-to-face university cohorts: A multi-group path analysis," *British Journal of Educational Technology*, vol. 54, no. 6, pp. 1917–1938, 2023. https://doi.org/10.1111/bjet.13329

[43] Q. T. Chan, "A study of the transition from online to face-to-face learning during post-pandemic: From university students' perspectives," Ph.D. dissertation, UTAR, 2023.

[44] J. Banfield and B. Wilkerson, "Increasing student intrinsic motivation and self-efficacy through gamification pedagogy," *Contemporary Issues in Education Research (CIER)*, vol. 7, no. 4, pp. 291–298, 2014. https://doi.org/10.19030/cier.v7i4.8843

[45] A. I. Polo-Peña, D. M. Frías-Jamilena, and M. L. Fernández-Ruano, "Influence of gamification on perceived self-efficacy: gender and age moderator effect," *International Journal of Sports Marketing and Sponsorship*, vol. 22, no. 3, pp. 453–476, 2021. https://doi.org/10.1108/IJSMS-02-2020-0020

[46] H. D. Ahmed, and G. Asiksoy, "The effects of gamified flipped learning method on student's innovation skills, self-efficacy towards virtual physics lab course and perceptions," *Sustainability*, vol. 13, no. 18, 2021. https://doi.org/10.3390/su131810163

[47] M. Nurtanto, N. Kholifah, E. Ahdhianto, A. Samsudin, and F. D. Isnantyo, "A review of gamification impact on student behavioral and learning outcomes," *iJIM*, vol. 15, no. 21, pp. 22–36, 2021. https://doi.org/10.3991/ijim.v15i21.24381

[48] X. Li, Q. Xia, S. K. W. Chu, and Y. Yang, "Using gamification to facilitate students' self-regulation in e-learning: A case study on students' L2 English learning," *Sustainability*, vol. 14, no. 12, 7008, 2022. https://doi.org/10.3390/su14127008

[49] Y. L. Chen, "A study on student self-efficacy and technology acceptance model within an online task-based learning environment," Journal *of Computers*, vol. 9, no. 1, pp. 34–43, 2014. https://doi.org/10.4304/jcp.9.1.34-43

[50] J. Reyna, J. Hanham, and B. Todd, "Flipping the classroom in first-year science students using H5P modules," *EdMedia+ Innovate Learning*, Association for the Advancement of Computing in Education (AACE), pp. 1077–1083, 2020.

[51] L. A. Killam and M. Luctkar-Flude, "Virtual simulations to replace clinical hours in a family assessment course: development using H5P, gamification, and student co-creation," *Clinical Simulation in Nursing*, vol. 57, pp. 59–65, 2021. https://doi.org/10.1016/j.ecns.2021.02.008

[52] L. Arulkadacham, "Same same or different?" Predictors of student success in online courses," *Tertiary Online Teaching and Learning*, pp. 129–136, 2020. https://doi.org/10.1007/978-981-15-8928-7_11

[53] T. Mohammed, "Designing an Arabic speaking and listening skills e-course: Resources, activities and students' perceptions," *Electronic Journal of E-Learning*, vol. 20, no. 1, pp. 53–68, 2022. https://doi.org/10.34190/ejel.20.1.2177

[54] T. Jacob and S. Centofanti, "Effectiveness of H5P in improving student learning outcomes in an online tertiary education setting," *Journal of Computing in Higher Education*, pp. 1–17, 2023. https://doi.org/10.1007/s12528-023-09361-6

[55] N. E. Olaniyi, "Threshold concepts: Designing a format for the flipped classroom as an active learning technique for crossing the threshold," *Research and Practice in Technology Enhanced Learning*, vol. 15, no. 2, 2020. https://doi.org/10.1186/s41039-020-0122-3

[56] A. M. Mutawa, J. A. K. Al Muttawa, and S. Sruthi, "The effectiveness of using H5P for undergraduate students in the asynchronous distance learning environment," *Applied Sciences*, vol. 13, no. 8, 4983, 2023. https://doi.org/10.3390/app13084983

[57] S. Rama Devi, T. Subetha, S. L. Aruna Rao, and M. K. Morampudi, "Enhanced learning outcomes by interactive video content—H5P in moodle LMS," in *Proc. Inventive Systems and Control: Proceedings of ICISC 2022*, Singapore, 2022, pp. 189–203. https://doi.org/10.1007/978-981-19-1012-8_13

[58] R. Singleton and A. Charlton, "Creating H5P content for active learning" *Pacific Journal of Technology Enhanced Learning*, vol. 2, no. 1, pp. 13–14, 2020. https://doi.org/10.24135/pjtel.v2i1.32

[59] J. Wehling, S. Volkenstein, S. Dazert *et al.*, "Fast-track flipping: Flipped classroom framework development with open-source H5P interactive tools," *BMC Medical Education*, vol. 21, no. 1, pp. 351, 2021.

[60] W. H. Carr, "Using the H5P digital platform as an active learning tool to build content-based critical thinking skills in an undergraduate immunology course," *The Journal of Immunology*, vol. 206, no. 1, 54, 2021. https://doi.org/10.4049/jimmunol.206.Supp.54.06

[61] Y. Shi, "A blended learning practice of" flipped classroom mode in intercultural communication course," *International Journal of Information and Education Technology*, vol. 12, no. 11, pp. 1260–1266, 2022. https://doi.org/10.18178/ijiet.2022.12.11.1748

[62] J. Cohen *Statistical Power Analysis for the Behavioral Sciences*, New York, NY: Routledge Academic, 1988.

[63] J. C. Nunnally and I. H. Bernstein, *Psychometric Theory*, New York. NY: McGraw-Hill, 1994.

[64] R. E. Mayer, "How multimedia can improve learning and instruction," *The Cambridge Handbook of Cognition and Education*, pp. 460–479, 2019. https://doi.org/10.1017/9781108235631.019

[65] B. S. Bloom, D. R. Krathwohl, and B. B. Masia, "Bloom taxonomy of educational objectives," *Allyn and Bacon*, London: Pearson Education, 1984.

[66] R. C. Clark and R. E. Mayer, *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*, 2016.

[67] M. Rayyan, N. Abusalim, S. Alshanmy, S. Alghazo, and G. Rababah, "Virtual versus reality: A look into the effects of discussion platforms on speaking course achievements in gather. town," *Electronic Journal of e-Learning*, vol. 22, no. 3, pp. 63–73, 2024. https://doi.org/10.34190/ejel.21.6.3276

[68] N. Abusalim, M. Rayyan, S. Alshanmy, S. Alghazo, and G. Rababah, "Digital versus classroom discussions: Motivation and self-efficacy outcomes in speaking courses via Gather. Town," *Journal of Applied Learning and Teaching*, vol. 7, no. 1, 2024. https://doi.org/10.37074/jalt.2024.7.1.24