

The Effectiveness of Adaptive Media Techniques in Enhancing Academic Performance of Secondary School Students

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Abstract

The objective of this study is to determine the effect adoption of adaptive media techniques to enhance the academic performance of secondary school pupils. The participants were separated into two groups: the experimental group, consisting of 22 students learning the content using adaptive media approaches, whilst the control group, consisting of 23 students learning the content using a conventional strategy. The results revealed that the implementation of adaptive media techniques may lead to enhanced academic performance among students. In addition, when the academic performance of the two groups was compared, there was a noticeable difference in their respective mean scores. In addition, when the academic performance was evaluated, it was determined that there was no significant difference between the post and follow-up mean scores. These findings support the case for expanding the use of adaptive media approaches in secondary schools as a means of improving students' academic performance.

Keywords: *Adaptive Media Techniques, Academic Performance, Secondary School.*

Introduction

Adaptive Media Technology (AMT) is material that includes general objectives that are in line with scientific requirements, as well as cutting-edge technology and other learning techniques for each beneficiary according to his or her individual capabilities. It makes a distinction between two terms—adaptable content and adaptive content—that are equivalent but are sometimes used interchangeably (Drissi & Amirat, 2016). According to Aldosari et al. (2018), adaptive content is that which may automatically adjust to any scenario based on the circumstances, being intrinsically rather than externally adaptive such as context (time, location, speed, nature, weather, and temperature), tool (operating system, mobile device, tablet), and person (age - gender - school stage - language - relationships). According to Alshammari and Qtaish (2019), adaptive electronic content is a term used to describe a personal e-learning system that supports adaptive interaction and presents educational content in accordance with the principles of adaptive hypermedia systems. In this system, the user provides data that the system uses to create a model, and the system then adapts the system's actions to fit the model.

The requirement to create a model for the learner is stressed in order for the e-content to be appropriately produced; it must be founded on instructional guidelines (Ennouamani & Mahani, 2017). Building the learner model, which holds the student's personal and content-related knowledge pages, is the foundation of adaptive learning systems (Normadhi et al., 2019). There are many different learner models, but the most popular class model is the one that describes the learner's knowledge as a partial set of the field expert's knowledge (Andrew et al., 2018). The learner is required to attain the knowledge

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level necessary for each component of the educational content because the class model encompasses the entire expert's body of knowledge and separates the content into its component parts (Aydođdu & Yalçın, 2020). A learning environment tailored to the student's performance and reactions is made possible by adaptive learning before the learning process even begins (Tomer et al., 2018). In order to arrange the educational experience, customize the material, assignments, and activities, and place the student at the right level for him, it depends on technology to download data (Imhof et al., 2020). This helps to accomplish and guide the student's learning objectives. The production of several tasks and activities that are suited to students' needs and skills is required for adaptive learning, which calls for instructors to prepare their material well in order to support the various learning routes recognized by the learner (Costa & Pifano, 2017).

Given that people's learning styles vary based on the elements influencing their knowledge acquisition, retention, and transfer, adaptive learning systems have a favorable impact on educational results (Alkhaldeh & Khasawneh, 2021). These systems' function is to provide material that corresponds to the learning preferences and styles of the students (Gabriel & Osuafor, 2021). Artificial intelligence and specialized algorithms are used by adaptive learning systems to change the material according to the inputs received (White, 2020).

Utilizing AMT, students are able to actively participate in their own education (El-Sabagh & Hamed, 2020). By analyzing a student's quiz responses, AMT, a piece of online educational software, modifies its instruction to better suit that person's preferred learning style (Ennouamani & Mahani, 2017). Interest-based AMT could be a useful tool for facilitating students' rapid mastery and retention of abstract concepts (Al-Chalabi & Hussein, 2020). This approach, which is an example of requirements engineering with a focus on learning outcomes, customizes instruction for each student. An AMT's responsibility is to customize the learning materials presented to each student (Aldosari et al., 2018). There is evidence that AMT systems that accommodate students' cognitive preferences result in higher achievement levels (Ali et al., 2019).

Each student can set his or her own pace in AMT. Thus, classrooms can be "customized" to meet the needs of each student (Normadhi et al., 2019). This investigation examines the use of an AMT in personalized online learning environments (Costa & Pifano, 2017). Individualized instruction can be made more effective by taking into account the students' skills and knowledge. The AMT system for individualization of instruction can modify the level of difficulty or the manner in which a given activity is presented in a given course sequence (Alshammari & Qtaish, 2019). Universities can now cultivate an environment centered on the needs of individual students (Dounas et al., 2019). In higher education, adaptive learning is being implemented to replace the outdated, cookie-cutter method of instruction (Cai, 2018).

Attitudes toward and confidence in employing an e-learning system are predictive of future use of that system (Yakubu & Dasuki, 2018). Overall, the findings indicate that students will utilize e-learning tools if they find them beneficial, user-friendly, and conducive to their education (Normadhi et al., 2019). Using AMT, various learner requirements can be met. Consequently, students are in a better position to demonstrate their mastery of course material (Gebhardt, 2018). Students and teachers viewed adaptive learning as beneficial due to its ability to zero in on difficult concepts and its capacity to inspire and engage students (Kakish & Pollacia, 2019). Consider the findings of the 2017 Digital Study Trends Survey conducted by McGraw-Hill Publishers, which polled over a thousand college students (Chun-Hui et al., 2017). The two most important findings regarding human emotion were: Sixty percent of students "feel" that digital learning technology has improved their grades, with one-fifth indicating that it has "significantly" enhanced their grades and Sixty-one percent or more of students "agreed" that using digital learning technology to prepare for exams is either extremely or very useful.

According to the findings of Andrew et al. (2018), students believe that AMT increases learning and prepares them for the future. Can we anticipate a similar relationship between these assessments and final grades? With the aid of an AMT, more feedback was provided to students. Student responsiveness to feedback is one of the most crucial components in successful education (Kolekar, Pai & Manohara Pai, 2017). But can we be certain that AMT facilitates student learning? Lin et al. (2019) indicates that adopting adaptive learning aids may help students learn more effectively. Miranda et al. (2017) analyzed the features of e-learning. The participation of stakeholders and students was a contributing factor. As a criterion for success in e-learning, however, the success of students in terms of knowledge and comprehension acquired was absent. This should be the outcome of education. Rather than the students' actual performance, it is their perceptions of these strategies that have shown to be the most useful (Lin et al., 2019).

Research Question

Based on the foregoing; the questions of the current study were determined as follows:

1. Are there any statistically significant differences between the mean scores of the students' control and experimental groups on the academic performance after applying the adaptive media technology in favor of the experimental group?
2. Are there statistically significant differences between the mean scores of the post and follow-up measurements in the academic performance of the experimental group after a month of applying the adaptive media technology?

Literature Review

Adaptive Learning

Adaptation is the process through which the shape, function, or behavior of an entity adapts to the needs of a particular environment or feature (White, 2020). One of the most important characteristics of e-learning systems is their ability to adapt to each individual student by identifying his or her own behavioral pattern and customizing the information delivered to that learner appropriately (Imhof et al., 2020). While the term "adaptive learning" may refer to a number of different things; Wang et al. (2019) defined it as a tool that monitors a student's most prominent characteristics in order to personalize his or her learning experience and provide constructive feedback and direction. It's characterized as a novel method of instruction that tailors lessons to each student by changing the level of difficulty in real time in response to their progress (Wang et al., 2019). According to Aydođdu and Yalçın (2020), this is offering a tailored educational resource for students, particularly learning content, since it helps people locate relevant educational materials by recommending specific learning pathways.

Battou, Baz and Mammass (2017) discussed the advantages of adaptive learning, including its efficiency and efficacy. Adaptive learning may now be used to a wider range of scientific fields than ever before because to improvements in both program hardware and software. Unlike conventional classrooms, adaptive learning environments enable instructors to provide students with individualized experiences depending on their needs, characteristics, and interests. Learners are able to choose adaptive material based on their own knowledge level or current knowledge state, and systems are able to track the progress of several students and provide them instant feedback based on their own performance. The interactive teacher of the system is responsible for encouraging students' progress toward skill mastery by delivering short knowledge exams, safeguarding the confidentiality of test results, and making supplemental resources and teaching accessible as required.

Teaching Using Adaptive Learning

Adaptive learning in the classroom requires a number of fundamental steps, including determining what will be taught, establishing learning objectives, determining how much time will be spent on each topic, selecting an acceptable set of teaching methods, and developing a system for assessing student progress (Soltani & Izquierdo, 2019). Teachers play a crucial role in the implementation of adaptive learning because they are in the best position to comprehend their students' learning styles, determine which teaching methods would be most effective for their subjects, and monitor their progress while providing additional assistance as needed (Muñoz et al., 2022). Mavroudi et al. (2018) argue that a teacher who is well-versed in instructional design is more equipped to provide engaging material and help students learn. Muñoz et al. (2022) designed an adaptive learning framework that involves selecting information representation strategies that are suitable with learners' cognitive demands (such as employing speech, sound, or drawing tools). Similarly, the development of multimedia clips, which have been shown to be particularly helpful in improving students' ability to retain information is essential. The creation of instructional and adaptive learning techniques while choosing the ideal writing tool for the system and content, elucidation of interactions, instructional techniques, tools, and material, identification of the different phases using a diagram, utilizing the writing tool to start putting the content design into practice, and then having an experimental group test the material to see what works and what doesn't.

Adaptive Media Technology

The term "adaptive media technology" is used to describe systems that combine hypermedia with the user model to tailor the information provided to each user as they navigate web-based "super spaces," taking into account the latter's prior knowledge, goals, and preferences (Laili et al., 2020). Adaptive presentation and adaptive navigation are the two primary forms of adaptation utilized in A.M.S.s; these two types of adaptation employ unique sets of tools (Elmabaredeyi, 2020).

Adaptive Navigation

The goal of adaptive navigation technology in the classroom is to help students succeed by making use of their own prior knowledge and desired outcomes (Gao & Groves, 2020). Each of the following must be present for adaptive navigation to be possible:

- **Annotation:** Enhancements are made to links by including comments or images that inform the learner of the material to be accessed before clicking on the link; those comments might be expressed orally, visually, or in a variety of typefaces and sizes (Tomer et al., 2018). According to study conducted by Dziuban et al. (2016), we may divide comments into three separate categories; By using a feature called "History-Based Annotation," you may note whether or not a certain link has been seen before; Annotating a student's level of knowledge on a certain subject in relation to a node; also known as "Knowledge-Based Annotation" and required-Based Annotation: a tool for defining the educational prerequisite ideas for each page based on the individual student's current level of understanding. This sort of comment is incorporated as a "help" button the student may click to get some background information on the current subject.
- **Sorting:** Using the pupil's model and a selection of their defining characteristics, the links are reorganized on the pages to prioritize the most significant one.
- **Hiding:** The links hiding approach assists in restricting and regulating the quantity of information inside the navigation area, hence reducing cognitive overload among students (Gao & Groves, 2020).
- **Direct guidance:** provides the learner with adaptive navigation in the simplest form possible by telling him or her which node is preferable to visit next. This strategy is

often used in instructional models that utilize curricular sequencing (Dziuban et al., 2016).

- Mapping: The learner is presented with a map that demonstrates the overall structure of the educational program's connected space and locates it there. Utilizing hiding, direct directing, and annotating technologies, it supports the curricular map viewpoint (Chen et al., 2020).

Adaptive Presentation

The objective of adaptive presentation technology is to customize the information given to each individual learner by hiding extraneous text or video (Martin et al., 2020). Khamees (2016) and Sayed et al. (2022) mentioned enumerated many technologies that may be used to achieve this objective as follow:

- The phrase "conditional text" refers to a method of dividing the idea of a course into sections, with each section being linked to a condition that specifies the kind of learner and the proficiency level of that student (Novice, Advanced, and Pro).
- Using stretch text, students may learn more about a topic by exploring it via a series of hot phrases and connections.
- Sections of the website are organized into several categories to cater to various types of students with varying degrees of background knowledge and preferred instructional methods. It has been established that each cluster of pages is related to a certain theme in the curriculum.
- Each page is broken up into many fragment variations, and several versions of the material for each fragment are stored and ready to be selected based on the needs of the individual learner.
- Each opening in the frame represented a different topic or subtopic within the same overarching notion, and the frames could be combined to reveal the most relevant one for each given pupil.

According to Elmabaredy (2020), there are significant educational benefits and values to be gained by using adaptive presentation based on adaptive media technology helping the student by providing information in response to his inquiries, bringing together many forms of information that are crucial to the adaptive process, and making an effort to modify instructional content and delivery to better suit the individual student's learning style and aptitude.

Academic Performance

The term "performance" is used to describe a person's actions in a controlled environment, such as an experiment (Carey et al., 2017). To put it another way, performance is a gauge of the observable aspects of behavior over a certain time frame (Pascoe et al., 2020). There is a performance test done to see how well something works. According to Wei (2017), a performance exam is a sort of mental test in which the participant is required to demonstrate their knowledge via action rather than verbalization. The capacity to interact with actual objects rather than abstract concepts may be shown via performance-based tests (Double et al., 2020).

In the context of educational research, a student's academic performance may be thought of as the student's observable and quantifiable behavior in a certain setting. Students' academic success in social studies, for instance, may be gauged by looking at their actions at any given moment in class (Gibbs et al., 2019). Students' academic progress in social studies is measured by their exam results at any given point in time. Thus, in the context of education, academic success may be defined as the demonstrated behavior or anticipated achievement of a stated goal (Kweon et al., 2017). Students' academic achievement is measured by their grades on various exams given by their teachers, such

as those given at the beginning and middle of the semester. When the result of interest is not clearly defined, measuring the psychological and psychosocial processes of learning and development is already a challenging task (Lee et al., 2018).

In general, one may guess that academic success, or more correctly, academic performance today works as an amorphous concept that substantially includes a broad variety of educational outcomes from degree achievement to moral growth (Ojukwu, 2017). Academic achievement has a moral dimension that should not be ignored at the expense of society's welfare.

The GPA is the standard for evaluating student success in school (GPA). Exams and ongoing assessments are standard methods for measuring student progress, but there is no consensus over what should be prioritized in terms of testing: procedural knowledge (such as skills) or declarative knowledge (such as facts) (Kabirikopaei et al., 2021). The marks students get from their professors at the end of an assessment system, most notably the oral, written, or practical tests they take during the school year, serve as the de facto measurement of academic success at the institutional level. How successfully pupils have accomplished their educational objectives may be gauged by measuring their performance. Educators create schools because they believe doing so would improve their students' chances of succeeding academically (Kabirikopaei et al., 2021).

Previous Studies

In light of the significance of adaptive media technology and the educational qualities it has, a number of earlier research have addressed the topic and concentrated on the use of technology in the growth performance of students.

Elmabaredy et al. (2020) made an effort to create and contrast two alternative ways for adaptive display (adaptive multimedia/ frames). This study aimed to find out how both approaches may help students' academic performance. The results showed that using flexible methods of presentation had a positive impact on the quality of students' understanding. Furthermore, there was a statistically significant difference in the mean scores of the two student groups as determined by comparing the two methods. The study concluded that the adaptive multimedia-based strategy was more effective than the frame-based technique.

Spruel (2020) assessed the effect of adaptive learning technology on student achievement. This quantitative research compared the academic accomplishments, dropout, completion, and passing rates of students enrolled in adaptive learning and conventional learning courses. The research population consisted of HBCU students enrolled in a Biology STEM course (HBCU). One set of students used adaptive learning technologies, whereas the other did not. The findings revealed a statistically significant difference between course types and course delivery modes in terms of academic outcomes, including completion and passing rates. There were no statistically significant differences between courses types in terms of dropout rates, however there were statistically significant variations between course types in terms of course delivery techniques. Students enrolled in adaptive learning classes reported the highest levels of satisfaction with adaptive learning technologies. Overall, adaptive learning demonstrated greater academic success than standard learning.

White (2020) compared the efficacy of adaptive learning technology to standard teaching techniques in a management information course for undergraduates. The sample was taken from a course in Information Technology at a prominent institution in USA. Recording test results is a component of the data gathering procedures. No correlation was found between adaptive learning technology use and performance on evaluative tasks or final grades. There were no significant differences in performance on any of the four exams or the overall course grade between the adaptive learning technology participants and non-participants.

Alkhalwaldeh and Khasawneh (2021) investigated the effect of adaptive media technologies on the English language success of students with learning difficulties. Therefore, adaptively planned and produced Internet-based educational material was created in accordance with adaptive media technology. The findings demonstrated a clear influence of adaptive media technology on the accomplishment or performance of (38) elementary-level children with learning difficulties in Abha schools.

Gabriel and Osuafor (2021) the influence of the Awka Education Zone's adaptive learning technique on the chemistry grades of pupils was evaluated. The study used a quasi-experimental methodology. There were 1,942 students enrolled in third-year chemistry courses in the Awka Education Zone, and 109 of them served as the sample for this research. The Chemistry Achievement Test was used to collect data for the study. The findings demonstrated that the average achievement scores of students who were taught chemistry using the adaptive learning approach were much higher than those of students who were taught using the conventional instructional method.

Research Method

The purpose of this research is to determine the effect of adaptive media technologies on student performance. Consequently, reliance on the quasi-experimental approach is warranted (Scher et al., 2015). This research adopted a quasi-experimental methodology by pre-testing students' performance, implementing adaptive media technology, and post-testing students' performance. In order to determine the size of the influence of the participants' replies, the research required comparing the pre- and post-test outcomes. Additionally, the follow up measurement was conducted three weeks following the conclusion of the implementation of adaptive media technology. Consequently, the tools included a test to evaluate student performance as well as the creation of an adaptive learning program using adaptive media technology.

Population and Sample

The population of interest from which each research participant is recruited for evaluation is known as the target population (Cooper, 1998). The entire population was from the four public comprehensive secondary schools in the Bani Obaid area of the Irbid governorate, which was the focus of this research (103). The sample size of (80) students was determined using Morgan's table. The study's sample was selected at random to ensure that different segments of the population were adequately represented. 69 pupils from public comprehensive secondary schools in the Bani Obaid region of the Irbid governorate took part in the study. At the completion of the data collection phase, 55 students from the educational institutions under scrutiny had responded. The number of usable questionnaires was cut down to 45, representing a response rate of 56.3% among all research participants, distributed into two groups (control and experimental).

Instruments Study

Adaptive media technology environments have been designed and developed using the ADDIE general concept for planning for learning and development. Analysis, design, development, implementation, and evaluation are the five cornerstones of the overarching model; it is a universally accepted template for curriculum development, and it is notable for its lucidity and breadth throughout the process.

- **Analysis:** The objectives of the study were an examination of student demographics, the formulation of a research problem, and the identification and evaluation of the needs of secondary school students who want to enhance their academic performance.
- **Design:** This phase involves the creation of the scenario, the formulation of the procedural goals, the selection of the sources (represented by texts and online

connections), and the defining of the learning strategies and assessment methods to be used.

- **Development:** At this point, the scenario was put into action, and authoring tools were utilized to create instructional materials and media, as well as to shape the physical space. The main and secondary pages of the adaptive content were created in Articulate Storyline, and from there a link was established between each page and a test that would evaluate the students' prior knowledge and store the results in an individual form; finally, a comprehensive list of cultural resources and hypermedia was compiled.
- **Implementation:** At this point, the information was packed in accordance with to Shared Object Reference Model (SCORM) specifications, and then published online through the Moodle LMS.
- **Evaluation:** A group of educational technology professionals were then presented with the adaptive media approach, they looked over the layout of the material and provided critique and recommendations for improvement. In order to catch any unforeseen problems, the method was further piloted on an additional exploratory sample of 13 pupils.
- **Making an Achievement Exam:** The purpose of this test was to evaluate the academic progress of secondary school pupils. The test was constructed using a table of specifications; the test itself consisted of 12 questions, each with sub-questions; it was created digitally with the aid of the tools provided by the Moodle learning management system; and it was presented to a panel of arbitrators, who confirmed the test's reliability and validity and suggested a few tweaks. The Alpha Cronbach coefficient was then used to determine the test's level of reliability, and a value of (0, 84).

After logging into the learning management system, students should immediately access the pre-test and complete it in its entirety. The preliminary research project was initiated in the first semester of the 2022–2023 school year. The information was made accessible to students using adaptive media techniques, and thereafter, they participated in exercises while their progress was tracked and they were given the opportunity to ask questions and provide feedback through electronic means. The accomplishment exam was administered to the experimental research group again after they had completed the experimental program to assess any performance gains or losses.

Data Analysis

The data collection process culminated in the calculation of pre- and post-test mean scores and standard deviations. The effectiveness of the adaptive media technology program in boosting pupils' academic performance was measured using the effect size (Eta square). Two comparable samples were compared using the Wilcoxon test and Z-value.

Results and Discussions

Before implementing the adaptive media technology, we made sure that the control and experimental groups were on the same academic performance level, as can be seen in Table 1.

Table 1: Pre-Measurement of Academic performance

Variable	Group	N	Mean Rank	Sum of Ranks	U	Z	P
Academic Performance	Experimental	22	20.39	448.58	82.25	0.067	0.856
	Control	23	21.62	497.26			

Table 1 shows that there are no statistically significant differences between the experimental and control groups in terms of pre-test mean scores of academic performance.

In order to answer the first question which states "Are there any statistically significant differences between the mean scores of the control and experimental groups on the academic performance after applying the adaptive media technology in favor of the experimental group?". The following table displays the findings.

Table 2: Post-Measurement to Academic Performance

Variable	Group	N	Mean Rank	Sum of Ranks	U	Z	P
Academic Performance	Experimental	22	25.23	555.06	4.00	4.604	0.001
	Control	23	18.75	431.25			

According to the results presented in Table 2, there is a statistically significant gap between the mean ranks of the scores obtained by the control group and those obtained by the experimental group on the academic performance scale in the post-measurement, with the favor of the experimental group. This indicates that the students who were chosen to participate in the experiment had a high level of academic achievement.

Based on these findings, it is evident that adaptive media technology does have an impact on the academic success of secondary school pupils. This is because of the nature of adaptive media systems, which allow them to assess a student's level of knowledge and experience before tailoring the content to his specific set of skills and expertise. Because adaptive media technology tailors instruction to each student's unique strengths and weaknesses, it has proven effective in fostering students' ability to track course material, hone their abilities, and successfully complete assignments.

Because to adaptive media technology, every student now has the option to practice skills several times, rematch demonstrations of them, and follow up on their progress. In addition, they needed to be able to stand for long periods of time and maintain their concentration throughout crucial performances in order to acquire the necessary abilities. Additionally, the core abilities were broken down into sub-skills and then presented in a series of sequential and logically ordered performances as part of the adaptive presentation of the subject. This enabled the students to better comprehend the relationships between the performances, the main skills, and the sub-skills, which facilitated easier application, training, and practice up until mastery.

Students are motivated to continue their education and continue to study via the use of preferred resources and media thanks to the thoughtful design of adaptive media and the adjustment of its capabilities to take into account the students' choices regarding media and numerous sources. In addition to engaging their various senses in an appropriate manner during skill training and offering external linkages and resources that promote skill learning, making the learning environment richer contributes to the development of students' cognitive and skill-based features.

The results of the current research are in agreement with results of Elmabaredy et al. (2020), Spruel (2020), Alkhaldeh and Khasawneh (2021) and Gabriel and Osuafor (2021), that asserted pupils' average success scores increased significantly while utilizing the adaptive learning strategy, compared to when using the traditional teaching method. Additionally, adaptive media technology gives each student the chance to repeat, re-present, and follow up on abilities. They were able to master the necessary talents thanks to their standing and concentration skills as well as other factors. Additionally, the adaptive presentation of the curriculum involved breaking down the primary abilities into secondary skills and then presenting them in sequential and logically ordered performances to assist students to grasp the connections between the primary and secondary skills and performances. Applying, training, and practicing till mastery are thus simple.

But disagree with the findings of White (2020), who asserted that the use of adaptive learning technologies did not affect students' performance. As figuring out each learner's learning type individually would be an extremely difficult and time-consuming procedure in a conventional setting. Additionally, instructors must be quickly trained in their methods before trying to use them. Additionally, the instructor has little faith in adaptive environments programs' capacity to identify the learner's style and the appropriate learning style.

In order to answer the second question which states "Are there statistically significant differences between the mean scores of the post and follow-up measurements in the academic performance of the experimental group after a month of applying the adaptive media technology?". The following table displays the outcomes.

Table 3: Post and Follow-up Measurement

Variable	Pre/ Follow	N	Mean Rank	Sum of Ranks	Z	P
Total	Negative	20	19.50	390.00	2.304	0.203
	rank	2	5.32	10.64		
	Positive	0				
	rank	22				
	Ties					
	Total					

There were no significant differences in the means of the post-test and follow-up evaluations between the experimental group and the control group, as shown in Table 3. Because of this, we may infer that the benefits of the adaptive media technology have endured throughout the monitoring period, and that there has been no regression after the completion of the program. This result makes sense considering the students' increased proficiency and the fact that they kept engaging in the adaptive media technology tasks that had previously given them the confidence to handle challenging situations.

The usage of adaptive media technology produced after-application impacts that were sustained in part due to continual evaluation during the implementation process and homework assignments. This indicates how much children like learning with adaptable forms of media, as well as how much they take pleasure in cooperating with one another. The foundations used in the application of adaptive techniques and software adopted in its design to offer the most possible help in luring students, keeping them from becoming distracted by teaching aids and other posters, and keeping their attention improved the academic performance of the students in the experimental group. Because adaptive media technology offers such a wide variety of educational means and tools, it has made it possible to successfully achieve the goals that have been established, such as the provision of audio-visual aids that bring the students' activity and thought into direct contact with one another and that afford them opportunities for first-hand experience and attentive listening.

Conclusion

The purpose of this research is to evaluate how the use of adaptive media technology affects the overall academic performance of high school pupils. It has been shown via the findings of this research that the use of adaptive media technology has an effect on academic achievement. Therefore, in order to increase students' academic performance it is vital to promote adaptive media technology. The findings also reveal that there are no variations in students' academic achievement in the tracer measuring of adaptive media technology. As a result, giving secondary schools' adaptive media technologies a higher priority is essential if one want to see improved academic achievement.

Recommendations

The researcher offers the following suggestions based on the results of the current study, the aforementioned theoretical framework, and previous research:

1. Making use of the adaptive media technology environment in programs that prepare students for high school.
2. A growing interest in the process of creating and showing material that is based on adaptive media technology.
3. The design of an online classroom that takes into account the students' previous experiences, interests, and preferred modes of education.

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