



Research Article

© 2023 Amenah Zakriah Abdellah Al-Sarayrah.
This is an open access article licensed under the Creative Commons
Attribution-NonCommercial 4.0 International License
(<https://creativecommons.org/licenses/by-nc/4.0/>)

Received: 26 November 2022 / Accepted: 15 April 2023 / Published: 5 May 2023

The Effect of Adaptive Learning Program in Developing Communication Skills

Amenah Zakriah Abdellah Al-Sarayrah

Lecturer, Social Studies Curriculum,
Department of Educational and Social Sciences,
Al Balqa Applied University, As-Salt, Jordan

DOI: <https://doi.org/10.36941/jesr-2023-0058>

Abstract

The objective of this study was to evaluate the effectiveness of the adaptive learning program in assisting middle school students to acquire communication skills, including reading, writing, listening, and speaking. Besides evaluating the program's efficiency in terms of enhancing students' communication skills after a month of participation. In the southern Mazar region of Jordan, 50 middle school students were evenly split into two groups: 25 (experimental) and 25 (control). The results of the control and experimental groups' scores on the post-measurement communication skills scale revealed statistically significant differences in favor of the experimental group. The study also showed that there were statistically significant differences in the experimental groups' mean communication skill scores between the pre-and post-program measurements, favoring the post-measurement. Furthermore, there were no statistically significant changes in the experimental group's communication skills between the post-test and follow-up evaluations.

Keywords: adaptive learning program, communication skills, middle school

1. Introduction

The school stage is one of the most critical phases of life since it has a considerable influence on the development of human capacities, the acquisition of diverse behavioral patterns, and the molding of a person's personality to successfully navigate life challenges (Adjeroud & Belouahem, 2020). The middle school acts as the basis for all educational data. The preparation stage involves scientific, cognitive, and social experiences that assist increase students' readiness and capabilities (Alaye & Tegegne, 2019). A trained educator is needed to monitor and lead the educational-learning process at this level (Zanqar, Khatibi, Azam & Tham, 2019).

The teacher is one of the most important active elements in educational work and the surrounding environment because of his role in dealing with students and providing them with different experiences, whether through the methods they follow or the various activities they prepare and implement with students (Bygate, 2016). This necessitates the mastery of several skills, the most significant of which is communication with pupils and others (Van den Branden, 2016). The teacher must be able to communicate the knowledge and experiences the students require. Ineffective communication between teachers and students impedes their learning (Coelho, Andrade & Portugal,

2018).

Communication is a foundation of the educational process, and the effectiveness of this process is contingent on the success of communication between the teacher and the student (Barrett, Davies, Zhang & Barrett, 2017). When they agree and understand each other, it improves teachers' relationships with students and helps students communicate effectively (Gerakopoulou, 2016). The students' acquisition of verbal and nonverbal communication skills, coupled with a weakness in the teachers' skills in creating successful communication behaviors, makes the student face the risk of maladaptation, whether inside or outside the school (Malec, Peterson & Elshereif, 2017). This leads to the need to train teachers to employ appropriate communication skills, a logical and scientific step to confront this diversity (Bustamante, Hindman, Champagne & Wasik, 2018).

One of the most forward-thinking and cutting-edge ways of education and training that is now available is known as adaptive learning (Ennouamani & Mahani, 2017). The fundamental objective is to modify the learning environment so that it better meets the individual needs of each learner (Aldosari, Aljabaa, Al-Sehaibany & Albarakati, 2018). The content that is taught in classroom classes is modified to adapt to the several ways in which pupils take in knowledge when they are in the process of receiving an education (El-Sabagh & Hamed, 2020). As a result, the content was presented in a way that considered the students' various learning styles. Alshammari and Qtaish (2019) verified that students may specify their learning preferences and that students are more satisfied when the learning environment is tailored to their choices. The idea that every person learns differently and at a different pace depending on their capacities and potential is the foundation for the process of education adaptation. Effective teaching necessitates the integration of various teaching techniques and educational experiences to satisfy the requirements of each student in an equal amount of time (Dounas, Salinesi & El Beqqali, 2019). Truong (2016) stressed that understanding instructors' learning patterns helps to establish an appropriate system that allows the construction of professional rehabilitation programs and suitable training techniques that match the learner's preferred independent learning style.

Moreover, several studies pointed to the importance of communication skills, such as Kunitz and Skogmyr Marian (2017), and Alaye and Tegegne (2019), which emphasized the necessity of training in communication skills in the contemporary educational work environment. There are also a lot of studies that rely on the design of training programs in developing communication skills, like Surendran (2018), Alshammari and Qtaish (2019), and Sabra, Abd El Zaher, and Mohamed (2020), which confirmed that the effectiveness of training programs in developing communication skills and emphasized the significance of training as a mediator. An educator has a role in effectively meeting the diverse needs of trainees, developing their professional skills and competencies, and an important role in fostering an environment where trainees feel comfortable asking questions and seeking answers. Numerous investigations have shown a serious shortcoming in the method teachers communicate with their students such as Ravindran and Kamaravel (2016), Pushpa (2016), and Kistiani and Permana (2020), who found that educators used or threatened punishment and spoke in a language that was difficult for students. It's a sign that pupils are losing the basics of their varied skills and are unable to communicate effectively with one another.

In light of the above, it should be stressed that instructors have great trouble conveying their expertise to students, which requires them to possess the knowledge, experience, and skills that the standard in-service teacher training system was unable to provide. The purpose of the current research was to develop an adaptive learning-based training program for middle school teachers to improve their educational communication skills. Because adaptive learning supports the customization of the educational environment to the attitudes of the students.

2. Research Questions

In light of the aforementioned, this study makes attempts to address the following questions:

1. Do the outcomes of the experimental and control groups on a test of communication skills

- change significantly after using the program?
2. Are there significant differences in the communication skills of the experimental group pre and post-implementation of the program?
 3. Are there significant differences in the communication skills of the experimental group post- and follow-up implementation of the program?

3. Literature Review

To accomplish successful communication, teachers must have a variety of communication skills (Gunes, 2014). A successful teacher has the skills to interact with pupils and properly convey his message (Vasquez, 2016). Success in life depends on a person's skills for efficient communication. The skill to communicate effectively with others depends on understanding the fundamentals of communication and developing the key element of successful communication (Kunitz & Skogmyr Marian, 2017). Communication is defined as the art and process of finding and exchanging ideas, and effective communication depends on the richness of these ideas (Anjomshoa & Sadighi, 2015). Communication can be defined as the process by which information is transmitted between individuals through a common system of symbols, signals, and behavior (Ali et al., 2017). The partners in this process are constantly communicating with one another in both directions. It has to be shaped like a circle to move both ways (Adjeroud & Belouahem, 2020). Communication is not a linear, one-way process; it is a dynamic, moving activity. Additionally, communication is a dynamic process that changes quickly with unpredictable outcomes (Alaye & Tegegne, 2019). The goal, the sender, the message, the means, the recipient, the feedback, the response, and the communication environment are some of the components that make up the communication process (Surendran, 2018).

Communication is a crucial and critical procedure for all the processes of agreement and understanding that educators must carry out to attain the educational institution's intended objectives (Setiawan, 2019). Because one acquires information through listening to and reacting to others, learning is highly dependent on communication (Sabra et al., 2020). The information fixation process cannot occur without communication, because there must be a sender who conveys the information or educational materials via a certain channel or technique that enables the content of the message to reach the recipient and has a particular impact on them (Kistiani & Permana, 2020). Consequently, it is inconceivable to think of a productive educational and instructional process devoid of effective communication based on solid methodological foundations that respect the principles of science and the requirements for its success (Seven, 2020). Educational communication may have a range of distinct meanings, depending on who is communicating and why.

Communication in education is described as the process of exchanging experiences between two or more individuals until it becomes widespread and common among them, resulting in the reshaping or modification of each participant's prior beliefs and views (Gràcia et al., 2021). The education process is not a process of conveying or imparting knowledge, but rather a meeting of two experiences on the subject of learning: the teacher's experience, which he gained through multiple situations, and the learner's experience, which is either nonexistent or incomplete but is often not equal to the teacher's experience (Peterson et al., 2016). To accomplish communication, the teacher must give the possibility for the student's area of expertise to become comparable to or near to his expertise. Likitrattanaporn (2017) stressed that to complete the communication process, a set of skills is needed. Without these skills, the communication process loses the most important conditions for its success, these skills including listening skills, speaking skills, reading skills, and writing skills.

Listening skill: An activity of interpersonal interaction in which one person listens to another person's spoken words. The student enters school with acquired patterns of speech based on what he has heard. Listening involves concentrating on a sound's source to gather its subtleties and details. This means that a student's ability to hear from birth is crucial. A child that is born deaf will have trouble learning to speak (Vasquez, 2016; Alaye & Tegegne, 2019).

Reading skill: the second skill of learning about the perspectives of people after hearing them out. The goal is to establish the correlation between verbal and written forms of communication. The learning environment is the student's starting point for teaching reading. That is, about the reading curriculum and how it is implemented in the classroom to aid students in their reading development. Therefore, the teacher must ensure the student's physiological readiness is enough to learn to read before beginning the reading instruction (Vasquez, 2016; Alaye & Tegegne, 2019).

Speaking skill: the successful technique used in the earliest phases of human development. As parents, we take great pride in hearing our children's first words, and we do our part to help them develop a strong command of the language by having frequent, in-depth conversations with them, which helps them develop a steady voice and, ultimately, social skills. In the topic of speech education, Wilson makes a distinction between the following three terms: The capacity to use a language appropriately is called "speech," while the ability to use the right language in its context is called "speaking," and "speaking" here refers to both verbal language and accompanying language (Vasquez, 2016; Alaye & Tegegne, 2019).

Writing skill: Like reading, writing is a part of the set of written productive abilities since it facilitates communication. If reading is the act of deciphering and converting written material into spoken language, then reading is a method through which information is conveyed from written to spoken form. To put it simply, writing is the act of transferring the symbols used in spoken language to those used in written text. As a system of symbols, writing is used to transfer meaning from one person to another. With the proper incentive, both the instructor and the student may improve their writing skills and progress toward their educational objectives. An educational institution's (and particularly a school's) ability to provide a conducive environment for learning is a key factor in inspiring pupils to actively pursue it (Vasquez, 2016; Alaye & Tegegne, 2019).

The effectiveness of the teachers in developing proper communication with the student largely relies on how earnest they are in understanding the importance of these skills in preparing the student for life (Barrett et al., 2017). The teacher's ability to interact with students efficiently and accurately is thus crucial, both within and outside of the classroom, since it is natural that this will have a positive impact on the educational process and its essential components (Bustamante et al., 2018). Therefore, it is important to develop training programs that instruct teachers on how to utilize communication skills with students by putting them through structured and targeted exercises that result in an ongoing, successful dialogue between the teacher and the students (Cai, 2018). It must be noted that this connection is not one-sided and that the teacher alone is its source; the student also contributes positively to this relationship. Because children's communication skills vary based on the patterns of the environments they grow up in and are exposed to, it is essential to use methodical and efficient methods to convey information to them.

To accomplish adaptation in the educational environment and scientific material, as well as how to portray this information, whether it be conventional or electronic, adaptive learning examines these issues (Andrew et al. 2018). Adaptive learning, which is a style of education created to adjust to the skills of an individual student, a particular group of learners, or the method they desire to study, is the subject of current research (Yakubu & Dasuki, 2018). Some kinds of learners benefit more from reading texts and seeing examples, while others like an explanation that is supported by graphics, audio, and an interactive presentation (Normadhi et al., 2019). To make the educational process more successful and efficient, it is required to concentrate on the most crucial problem, namely the adaptability of the learning environment with diverse learners' styles (Gebhardt, 2018). Simply, learning environments will be more adaptable and able to adjust how the information is delivered based on what it determines from the features and characteristics of the learning style (Kakish & Pollacia, 2019).

The idea of learning styles is used by educators and psychologists to describe the different mediating processes that the learner employs during his interaction with learning situations, which ultimately results in the development of new educational experiences that expand the body of cognitive learning (Chun-Hui, Wu, Chen, & Chen 2017). As a result, the person responds to different

environmental stimuli in a way that is compatible with his cognitive, emotional, social, and physical traits (Kolekar, Pai & Manohara Pai, 2017). This suggests that the pattern or style of learning is a description of the proper adaptation processes.

Adaptive learning was motivated in part by the realization that learning design cannot be achieved at scale using traditional, non-adaptive approaches (Lin, Xie, Xiao & Deng, 2019). The adaptive learning system seeks to transform the learner from the passive receiver of information into a collaborator in the educational process (Miranda, Isaias, Costa & Pifano, 2017). The term "adaptive learning" refers to a style of teaching that takes into consideration the specific peculiarities of each student while also tailoring instruction to the patterns, approaches, and features of various learners (White, 2020). The foundation of adaptive learning is the fusion of cognitive psychology ideas. It is based on the principle of learning styles, which is based on the approach that a person prefers to gather, process and retain knowledge (Imhof, Bergamin & McGarrity, 2020). It is within the area of individual differences that verifies that people have varied ways of seeing things, and because of the various learning preferences of people, a suitable learning environment is offered to them (Wang et al., 2019).

According to the "learning styles" theory, people innately favor one learning style over another. These approaches are broken down into seven categories: kinesthetic, logical, visual, self-directed, cooperative, musical, and linguistic (Aydoğdu & Yalçın, 2020). Some students blend between the seven styles, and some of them have strengths in certain styles. Teachers must consider this and work to better understand each student's strengths, which requires that they plan their classes around the interests and activities of their pupils (Battou, Baz & Mammass, 2017).

The primary goal of adaptive learning is to reduce a learner's social comparison with other learners, where the learner should focus on his positives and compare himself to his self-development and individual goals; this is what helps him develop his self-confidence, in addition to creating his own positive educational identity (Soltani & Izquierdo, 2019). Adaptive learning achieves many benefits as a result of the additions it makes to the educational system, where it places the learner at the center of the educational process, achieves the principle of diagnosing education, develops the learners' self-confidence and abilities by presenting the content in a way that suits each learner individually, and makes the process of guidance and counseling by the teacher smarter, as his role will be to provide guidance (Mavroudi, Giannakos & Krogstie 2018; Muñoz et al., 2022).

The primary benefit of adaptable learning is that it caters to each student's unique needs and preferences in terms of how they learn best (Laili et al., 2020). This is accomplished via the adaptation of two fundamental aspects of adaptive learning:

Individual adaptive system: a system in which each student has an individualized educational plan based on his requirements, interests, and credentials. This characteristic, which cannot be realized in a traditional classroom, is seen as an ideal by several educators. They also argue that this involves arduous effort and distinct procedures that cannot be handled simultaneously (Elmabaredyi, 2020).

The rich classroom model Necessitates a classroom environment rich in chances, choices, and the learner's freedom to select among many levels, tasks, settings, and instructional styles. Consequently, the learner is responsible for monitoring his learning process, and the teacher's responsibility is reduced to advising the learner on his choices and creating opportunities and activities for him (Gao & Groves, 2020).

Through these two aspects, the student may be seen as a topic or a goal, allowing him to choose his particular educational plan in conjunction with his instructor, or to pick among options within the classroom (Tomer et al., 2018). This is what is known as "qualitative adaptation", in which the student is the effective and active source in his educational process (Chen et al., 2020). However, if the teacher is the only source of all choices and is exclusively responsible for adjusting levels, material, and strategies, this is referred to as "quantitative adaptation" (Martin, Chen, Moore & Westine, 2020). Due to the difficulties of implementing qualitative adaptation in the area of training and skills development, the research depends on quantitative adaptation as the foundation for

developing the training program (Sayed et al., 2022).

4. Previous Studies

Alfarra (2019) determined how well a program based on adaptive learning helped kindergarten teachers improve their communication skills in the classroom. The study used a semi-experimental design. The population of this study contains All of the city of Hama's (212) kindergarten teachers who are teaching students in the third category between the ages of (5-6) years old. A training program based on adaptive learning and test communicative attitudes assessment for kindergarten teachers was created to gather data. The results demonstrated that there are statistically significant variations in the experimental group's mean scores in the pre and post-measures of the communicative attitudes exam, favoring the post-measurement. Additionally, the post-measurement of the communicative attitudes test according to learning styles revealed no statistically significant differences in the mean scores of the experimental group (visual, auditory, and motor).

Spruel (2020) analyzed the impact of individualized education technologies on academic performance. Academic performance, retention, and success were compared between students taking adaptive learning and traditional instruction in this quantitative study. Participants in the study were undergraduates from HBCUs who were taking a STEM Biology course (HBCU). When compared to the other group, the students who utilized adaptive learning tools performed better. Academic results, including completion and passing rates, were shown to vary significantly between course kinds and delivery formats. While there were no statistically significant differences in attrition rates across courses, there were notable disparities in the methods used to teach them. High levels of satisfaction with adaptive learning technology were expressed by students who took part in adaptive learning programs. Overall, adaptive learning outperformed traditional methods in the classroom.

White (2020) evaluated the efficiency of adaptive learning technology compared to conventional teaching techniques in a management information course for undergraduates. Data was collected from a computer science course at a prestigious institution. Testing results are recorded as part of the data-gathering process. There was no correlation between using an adaptive learning platform and doing better on exams or in the course overall. There were no significant differences in performance on any of the four exams or the overall course grade between the groups who did and did not use adaptive learning technologies.

El-Sabagh (2021) created a personalized online education program that caters to each student's chosen style of learning and studied the impact of this program on student involvement. This research also attempted to define the recommended adaptive e-learning environment and compare it to the more conventional e-learning technique. Various research methodologies were used in this study to examine the following effect: Using a development strategy and a quasi-experimental research method, an adaptive e-learning environment was constructed. The student engagement scale measures abilities, participation/interaction, performance, and emotions to ascertain the amount of classroom involvement. The experimental group had a statistically significant rise compared to the control group. These results indicate that an adaptive online classroom may drive students to learn. The article provides several practical suggestions, such as how to establish a foundation for adaptive e-learning based on learning styles and how to implement it, how to optimize the impact of adaptive e-learning in education, and how to increase the cost-effectiveness of education. The outcomes of the proposed adaptive e-learning technique might assist e-learning institutions in developing more customized and responsive online classrooms.

5. Methodology

The study used a quasi-experimental design, which enables the analysis of the effects of an independent variable (the adaptive learning program) on a dependent variable (communication skills). The researcher used one of the experimental methods, which included creating a control

group and an experimental group based on how the sample students were chosen at random and assessing them pre and post-trial, as follows:

1. The 50 students who were chosen as the sample were split into two groups using a random selection process (control and experimental).
2. Verify that the students in the two groups have equivalent communication skills.
3. Subjecting the experimental group to the independent variable (adaptive learning program) and withholding it from the control group.
4. Post-measurement for the two groups (control and experimental) to determine the impact of applying for the adaptive learning program.
5. The experimental group is retested in approximately a month to evaluate whether the adaptive learning program is maintaining its impact and to make sure that the improvement in the dependent variable (communication skills) is lasting.

6. Study Population and Sample

The sample members of this study were selected from students in the middle stage who registered at the directorate of education, southern Mazar district in Jordan within the period (15/9/2022-15/11/2022). The students included in this research sample were those who met the criteria listed below:

1. The age of the learner should range between 12 and 15 years.
2. The student has no infirmities that may hinder his reaction or comprehension, such as a hearing problem, according to the Ministry of Health's medical reports.
3. Complete agreement and willingness to take part in the research and further lessons to apply for the adaptive learning program.

The criteria were met by 50 students, who were then randomly split into two groups of similar size, each with 25 students. The experimental group, which would get the adaptive learning program created for this research, was randomly selected from the two groups, while the control group, which would not receive the adaptive learning program, was also randomly selected. A total of 32 sessions—16 each month—were given to each student as part of the adaptive learning program, which was implemented in the experimental sample over two months.

7. Study Instrument

To achieve the objectives of the study, two different research instruments were utilized:
Communication skills: The measure was developed by the researcher after looking at students' communication skills in the classroom. The scale comprises 60 items that assess skills of listening, speaking, writing, and reading (15 items each). The scale was applied pre-, post-, and follow-up of applying for the adaptive learning program on the study sample.

The adaptive learning program: The program that was suggested was designed using the following steps:

In developing the program, the researcher relied on the principles and foundations of adaptive learning, which centered on the theory of learning styles and the Neil Fleming model as a trend in education and training. These foundations are represented in the following:

Adaptation of the training environment: for it to be flexible, just as a learner who is handled correctly is flexible and can get around the features of the educational environment. A properly designed training environment is smooth, flexible, and not rigid so that it wraps around the trainees and conforms comfortably to their characteristics.

Adaptation in managing and arranging the training room: No training room arrangement is approved. This depends on the trainees' personalities, connections, and jobs. Because these activities will create the correct arrangement technique and it is possible to organize their sitting according to the trainer's approach throughout the training session and split the trainees into groups depending

on their chosen learning style.

Adaptation of scientific content: This is done by choosing activities that are consistent with the trainees' learning patterns. The trainer may accomplish this by picking the proper tactics for each pattern and giving various resources depending on the trainees' interests or degree of skill.

Adaptation in tasks: Whether during or after the training process, the trainer is not required to provide all learners with the same tasks and responsibilities. Instead, the way of giving them work may be modified to fit their chosen teaching or learning style.

8. Instrument Validity and Reliability

Two methods were used to verify the validity of the scale:

1. The validity of the scale's content is determined by submitting it to ten arbitrators and using 80% as the percentage of their acceptance of the arbitrators' agreement.
2. The discriminating validity of the scale was evaluated by administering it to a group of 14 experimental students. For the (F) values of the discriminatory validity, four statistically significant coefficients were found (2.50, 5.70, 6.63, and 7.50).

According to Cronbach's alpha equation, the scale's internal consistency was calculated, and the reliability coefficient for the scale as a whole was (0.895), with reliability coefficients for the four dimensions ranging between (0.788-0.874).

9. Data Analysis

After data collection, the mean test scores and standard deviations for the pre-and post-tests were calculated. The impact size was calculated using the Eta square, which illustrates how well the adaptive learning program helped students improve their communication skills. To highlight the differences between two similar samples, the Z-value and Wilcoxon's test were also used.

10. Results and Discussion

Before beginning to apply for the adaptive learning program, it was made certain that both the control group and the experimental group had the same level of communication skills, as shown in Table 1.

Table 1: Pre-Measurement of Skills

Skills	Groups	N	Mean Rank	Sum of Ranks	U	Z	P
Listening	Experimental	25	23.80	595.00	171.00	0.728	0.403
	Control	25	27.05	676.25			
Reading	Experimental	25	24.45	611.25	182.00	0.526	0.457
	Control	25	26.50	662.50			
Writing	Experimental	25	26.20	655.00	189.00	0.534	0.786
	Control	25	24.80	620.00			
Speaking	Experimental	25	26.40	660.00	1169.80	0.756	0.523
	Control	25	23.80	595.00			
Total	Experimental	25	25.45	636.25	196.00	0.112	0.840
	Control	25	25.65	641.25			

According to Table 1, there was not a statistically significant difference between the control group and the experimental group in terms of the pre-test means of the students' listening, reading, writing, and speaking skills measurements, nor was there a difference in terms of communication skills as a whole.

To answer the first question which states "Do the outcomes of the experimental and control groups on a test of communication skills change significantly after using the program?". The results are shown in the table below.

Table 2: Post-Measurement to Skills

Skills	Groups	N	Mean Rank	Sum of Ranks	U	Z	P
Listening	Experimental	25	33.50	837.50	50.00	4.882	0.00
	Control	25	23.30	552.50			
Reading	Experimental	25	39.80	995.00	40.00	6.120	0.00
	Control	25	18.30	457.50			
Writing	Experimental	25	40.20	1005.00	12.00	7.255	0.00
	Control	25	22.10	552.50			
Speaking	Experimental	25	46.50	1162.50	7.00	11.235	0.00
	Control	25	20.50	512.50			
Total	Experimental	25	44.90	1122.50	6.00	11.925	0.00
	Control	25	19.30	482.50			

According to Table 2, there are statistically significant differences between the control and experimental groups' mean scores on tests of listening, reading, writing, speaking, and communication skills measurement as a whole following the post-measurement, with the experimental group, generally benefiting. This implies that the experimental group of pupils has highly developed communication skills.

This outcome is attributable to the fact that students are exposed to identical environmental circumstances while in school. However, this is insufficient for the development of their communication skills, since they need a role model to emulate and learn from to interact effectively with one another and with others. After being exposed to the program, students exhibited more positive classroom behavior, which contributed to the development of a good attitude among them. The increased willingness of these pupils to build communicative interactions with others had a good effect on their communication development. In other words, the training program, including its content, procedures, and methodologies, was mirrored in the skill development of the students as a result of its influence on the student's skills and academic performance. This finding is similar to that of Alfara (2019) and El-Sabagh (2021) and differs from that of Spruel (2020) and White (2020).

To answer the second question which states "Are there significant differences in the communication skills of the experimental group pre and post-implementation of the program?". The results are shown in the table below.

Table 3: Pre and Post-Measurement of Experimental Group

Skills	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Listening	negative rank	3			4.774	0.00
	positive rank	22	2.70	8.10		
	ties	0	20.30	446.60		
	total	25				
Reading	negative rank	3			4.856	0.00
	positive rank	22	2.70	8.10		
	ties	0	20.30	446.60		
	total	25				
Writing	negative rank	3			4.635	0.00
	positive rank	22	2.70	8.10		
	ties	0	20.30	446.60		
	total	25				

Skills	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Speaking	negative rank	3		8.10	4.854	0.00
	positive rank	22	2.70	446.60		
	ties	0	20.30			
	total	25				
Total	negative rank	3		8.10	4.877	0.00
	positive rank	22	2.70	446.60		
	ties	0	20.30			
	total	25				

Table 3 shows that there are statistically significant differences in the means of the experimental group's scores on measures of listening, reading, writing, speaking, and overall communication skills. Improvements in all aspects of the communication skills assessment were seen among students in the experimental group.

This result is attributable to the researcher's reliance in designing the program on adaptive learning, which seeks to transform the learner from a passive information receiver into an active participant in the educational process by providing training content commensurate with the preferred learning styles of the learners. This allowed students to practice and think according to their chosen manner, which aided in the development of their communication abilities and facilitated the learning process. In addition to the use of various training strategies suitable for each learning style of the trainees, such as picture shows, discussion and dialogue, brainstorming, puzzles, role-playing, and concept maps, the motivation and vitality of students to participate in the program increased, leading to the development of communication skills. In addition to designing the activities of the program to take into account the adaptation of the scientific content to the different learning styles (audio-visual-kinesthetic), which assisted the students in acquiring the skills included in the program, a variety of educational sources that are in significant accordance with the learning styles were used in the collection of information. This result is similar to studies of Alfarra (2019) and El-Sabagh (2021) but dissimilar to studies of Spruel (2020) and White (2020).

To answer the third question which states "Are there significant differences in the communication skills of the experimental group post- and follow-up implementation of the program?". The results are shown in the table below.

Table 4: Post and Follow-up Measurement of Experimental Group

Skills	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Listening	negative rank	5		15.00	1.587	0.071
	positive rank	0	3.00	0.00		
	ties	20	0.00			
	total	25				
Reading	negative rank	13		84.50	1.807	0.112
	positive rank	9	6.50	45.00		
	ties	3	5.00			
	total	25				
Writing	negative rank	3		6.00	0.618	0.512
	positive rank	9	2.00	45.00		
	ties	16	5.00			
	total	25				
Speaking	negative rank	12		78.00	1.332	0.425
	positive rank	10	6.50	55.00		
	ties	3	5.50			
	total	25				
Total	negative rank	6		21.00	1.511	0.354
	positive rank	5	3.50	15.00		
	ties	14	3.00			
	total	25				

Table 4 demonstrates that there are no statistically significant differences in the mean scores for the experimental group between the post-test and follow-up assessments. This demonstrates the program's persistence in its effectiveness throughout the follow-up period and the absence of relapse after the program. This result might be evaluated in light of the students' increased communication skills and ongoing participation in program activities.

The researcher attributed this result to the implementation of the suggested training program on the requirements of students in the area of communication skills, which assisted in satisfying the students' desire to acquire these abilities, particularly because they had not been exposed to them in the past. The researcher also attributed this result to the fact that the researcher was able to attribute this result to the implementation of the suggested training program. The researcher also attributes the students' access to the level of mastery to the focus of the program's objectives on communication skills, which helped to immerse them in the performance of these skills and then help them reach the level of mastery and mastery of them. This is another reason why the researcher believes the students were able to access the level of mastery. In addition to centering the substance of the program more on the actual application, rather than just concentrating on the presentation of theoretical information.

11. Conclusion

This research provides evidence for the idea that an adaptive learning program may assist middle school pupils in developing their communication skills. In addition, the findings suggest that a program designed particularly for this objective may be more successful than typical programs in boosting these students' proficiency levels of communication skills. To the program's objectives, it is advantageous for teachers to enhance students' communication skills since students need a model to imitate and learn from to connect successfully with each other and others. The outcomes of this research demonstrated how adaptive learning programs foster positive student attitudes. The increased desire of these students to engage in communicative relationships with others had a positive impact on their communication development. In other words, the training program's content, methods, and methodology were reflected in the growth of students' skills due to its influence on students' skills and academic performance. The reason for concluding that the program led to the transformation of the learner from a passive receiver of bad information to an active participant in the educational process may be found in the provision of training material that corresponds to the chosen learning styles of the learners. This enabled students to practice and think in their preferred manner, enhancing their communication skills and facilitating the learning process. In addition to using several training approaches that are tailored to the individual learning styles of the trainees, the teacher employs other training methods.

12. Recommendations

Following are some recommendations made by the researcher in light of the findings of the research:

1. Employing the adaptive learning system in diverse disciplines of education in an optimized with learners' learning patterns, and utilizing it to acquire additional skills and knowledge.
2. Adopting the adaptive learning system has been shown to raise academic achievement and communication skills.
3. Conducting more studies on the effects of adaptive learning in different contexts.

References

Adjeroud, S., & Belouahem, R. (2020). Writing instructions within the competency-based approach in Algerian secondary schools have traditions of reality and viewpoints. *Journal of the Human Sciences*, 31(1), 515-530. <http://dx.doi.org/10.34174/0079-021-001-032>

- Alaye, A., & Tegegne, W. (2019). A critical review of the meaning, purposes, and techniques of the integrative language skills teaching approach. *Critical Review*, 58 <http://dx.doi.org/10.7176/jilll/58-03>
- Aldosari, M., Aljabaa, A., Al-Sahaibany, F., & Albarakati, S. (2018). Learning style preferences of dental students at a single institution in Riyadh Saudi Arabia, evaluated using the VARK questionnaire. *Advances in Medical Education and Practice*. <https://doi.org/10.2147/AMEP>.
- Alfarra, G. (2019). *The Effectiveness of a Proposed Training Program Based On Adaptive Learning in Developing Educational Communication Skills Among Kindergarten Teachers and its impact on improving Child's Communication* (Doctorate Degree in Child Education, AL - Baath University and Faculty of Education).
- Ali, N., Eassa, F., & Hamed, E. (2019). Personalized Learning Style for Adaptive E-Learning System, *International Journal of Advanced Trends in Computer Science and Engineering*. 223-230. Retrieved June 26, 2020, from. <http://www.warse.org/IJATCSE/static/pdf/file/ijatcse418112019.pdf>.
- Alshammari, M., & Qtaish, A. (2019). Effective adaptive e-learning systems according to the learning style and knowledge level. *JITE Research*, 18, 529-547. <https://doi.org/10.28945/4459>.
- Andrew, M., Taylorson, J, Langille, D. J, Grange, A., & Williams, N. (2018). Student attitudes towards technology and their preferences for learning tools/devices at two universities in the UAE. *Journal of Information Technology Education: Research*, 17, 309-344. <https://doi.org/10.28945/4111>.
- Anjomshoa, L., & Sadighi, F. (2015). The importance of motivation in second language acquisition. *International Journal on Studies in English Language and Literature (IJSELL)*, 3(2), 126-137.
- Aydoğdu, Y. Ö., & Yalçın, N. (2020). A Web-Based System Design for Creating Content in Adaptive Educational Hypermedia and Its Usability. *Malaysian Online Journal of Educational Technology*, 8(3), 1-24. <http://dx.doi.org/10.17220/mojet.2020.03.001>
- Barrett, P., Davies, F., Zhang, Y., & Barrett, L. (2017). The holistic impact of classroom spaces on learning in specific subjects. *Environment and Behavior*, 49(4), 425-451. <http://dx.doi.org/10.1177/0013916516648735>
- Barrett, P., Davies, F., Zhang, Y., & Barrett, L. (2017). The holistic impact of classroom spaces on learning in specific subjects. *Environment and Behavior*, 49(4), 425-451. <http://dx.doi.org/10.1177/0013916516648735>
- Battou, A., Baz, O., & Mammass, D. (2017). Toward a framework for designing adaptive educational hypermedia system based on an agile learning design approach. In *Europe and MENA Cooperation Advances in Information and Communication Technologies* (pp. 113-123). Springer, Cham. http://dx.doi.org/10.1007/978-3-319-46568-5_12
- Bustamante, A. S., Hindman, A. H., Champagne, C. R., & Wasik, B. A. (2018). Circle time revisited: How do preschool classrooms use this part of the day? *The elementary school journal*, 118(4), 610-631. <http://dx.doi.org/10.1086/697473>
- Bygate, M. (2016). Sources, developments, and directions of task-based language teaching. *The language learning journal*, 44(4), 381-400. <http://dx.doi.org/10.1080/09571736.2015.1039566>
- Cai, R. (2018). Adaptive learning practice for online learning and assessment. *Proceedings of the 2018 International Conference on Distance Education and Learning* (pp. 103-108). ACM. <https://doi.org/10.1145/3231848.3231868>.
- Chun-Hui, Wu., Chen, Y.-S., & Chen, T. C. (2017). An adaptive e-learning system for enhancing learning performance: based on dynamic scaffolding theory. *Eurasia Journal of Mathematics, Science and Technology Education*. <https://doi.org/10.12973/ejmste/81061>.
- Coelho, D., Andrade, A. I., & Portugal, G. (2018). The 'Awakening to Languages' approach at preschool: developing children's communicative competence. *Language awareness*, 27(3), 197-221. <http://dx.doi.org/10.1080/09658416.2018.1486407>
- Dounas, L., Salinesi, C., & El Beqqali, O. (2019). Requirements monitoring and diagnosis for improving adaptive e-learning systems design. *Journal of Information Technology Education: Research*, 18, 161-184. <https://doi.org/10.28945/4270>.
- Elmabaredy, A., Elkholy, E., & Tolba, A. A. (2020). Web-based adaptive presentation techniques to enhance learning outcomes in higher education. *Research and Practice in Technology Enhanced Learning*, 15(1), 1-18. <http://dx.doi.org/10.1186/s41039-020-00140-w>
- El-Sabagh, H. A., & Hamed, E. (2020). The Relationship between Learning Styles and Learning Motivation of Students at Umm Al-Qura University. *Egyptian Association for Educational Computer Journal*. <https://doi.org/10.21608/EAEC.2020.25868.1015>
- Ennouamani, S., & Mahani, Z. (2017). An overview of adaptive e-learning systems. *Eighth International Conference on Intelligent Computing and Information Systems (ICICIS)*. <https://doi.org/10.1109/INTEL CIS.2017.8260060>.
- Gao, H., & Groves, P. D. (2020). Improving environment detection by behavior association for context-adaptive navigation. *NAVIGATION: Journal of the Institute of Navigation*, 67(1), 43-60. <http://dx.doi.org/10.1002/navi.349>

- Gebhardt, K. (2018). Adaptive learning courseware as a tool to build foundational content mastery: Evidence from principles of microeconomics. *Current Issues in Emerging eLearning*, 5(1), 7-19.
- Gerakopoulou, O. (2016). Scaffolding oral interaction in a CLIL context: A qualitative study. *Selected papers on theoretical and applied linguistics*, 21, 602-613.
- Gràcia, M., Vega, F., Jarque, S., Adam, A. L., & Jarque, M. J. (2021). Teaching practices for developing oral language skills in Catalan schools. *Cogent Education*, 8(1), 1935647. <http://dx.doi.org/10.1080/233186x.2021.1935647>
- Güneş, F. (2014). Eğitimde yöntem ve teknik tartışmaları. *International Journal of Language Academy*, 2(4), 23-35. <http://dx.doi.org/10.18033/ijla.183>
- Imhof, C., Bergamin, P., & McGarrity, S. (2020). Implementation of adaptive learning systems: Current state and potential. *Online teaching and learning in higher education*, 93-115. http://dx.doi.org/10.1007/978-3-030-48190-2_6
- Kakish, K., & Pollacia, L. (2018). Adaptive learning to improve student success and instructor efficiency in introductory computing courses. *Proceedings of the Information Systems Education Conference (ISKCON). San Antonio, Texas. v34, 72-78.*
- Kistiani, D. P., & Permana, J. (2020). The Importance of Application Total Quality Management at Higher Education. In *3rd International Conference on Research of Educational Administration and Management (ICECREAM 2019)* (pp. 177-180). Atlantis Press.
- Kolekar, S. V., Pai, R. M., & Manohara Pai, M. M. (2017). Prediction of learners' profiles based on learning styles in an adaptive e-learning system. *International Journal of Emerging Technologies in Learning*, 12(6), 31-51. <https://doi.org/10.3991/ijet.v12i06.6579>.
- Kunitz, S., & Marian, K. S. (2017). Tracking immanent language learning behavior over time in task-based classroom work. *Tesol Quarterly*, 51(3), 507-535. <http://dx.doi.org/10.1002/tesq.389>
- Laili, N., Vibraena, V. M., Silmi, N., Ummah, U. S., & Efendi, M. (2020, December). Mantuku (Manekin Tubuhku: As an Adaptive Media for Sex Education to Toddlers). In *1st International Conference on Early Childhood Care Education and Parenting (ICECEP 2019)* (pp. 146-151). Atlantis Press. <http://dx.doi.org/10.2991/assehr.k.201205.102>
- Likitrattanaporn, W. (2017). The development of English language teaching skills for graduate students through the process of learning by doing. *English Language Teaching*, 10(7), 96-103. <http://dx.doi.org/10.5539/elt.v10n7p96>
- Lin, H., Xie, S., Xiao, Z., & Deng, X. (2019). Adaptive recommender system for an intelligent classroom teaching model. *International Journal of Emerging Technology in Learning*, 14(5), 51-63. <https://doi.org/10.3991/ijet.v14i05.10251>
- Malec, A., Peterson, S. S., & Elshereif, H. (2017). Assessing young children's oral language: Recommendations for classroom practice and policy. *Canadian Journal of Education/Revue canadienne de l'éducation*, 40(3), 362-392. <http://dx.doi.org/10.4995/eurocall.2018.8599>
- Martin, F., Chen, Y., Moore, R. L., & Westine, C. D. (2020). A systematic review of adaptive learning research designs, context, strategies, and technologies from 2009 to 2018. *Educational Technology Research and Development*, 68(4), 1903-1929. <http://dx.doi.org/10.1007/s11423-020-09793-2>
- Miranda, P., Isaias, P., Costa, C., & Pifano, S. (2017). Validation of an e-learning 3.0 critical success factors framework: A qualitative research. *Journal of Information Technology Education: Research*, 16, 339-363. <https://doi.org/10.28945/3865>
- Muñoz, J. L. R., Ojeda, F. M., Jurado, D. L. A., Peña, P. F. P., Carranza, C. P. M., Berríos, H. Q., ... & Vasquez-Pauca, M. J. (2022). Systematic Review of Adaptive Learning Technology for Learning in Higher Education. *Eurasian Journal of Educational Research*, 98(98), 221-233.
- Normadhi, N. B., Shuib, L., Nasir, H. N. M., Bimba, A., Idris, N., & Balakrishnan, V. (2019). Identification of personal traits in an adaptive learning environment: Systematic literature review. *Computers & Education*, 130, 168-190. <https://doi.org/10.1016/j.compedu.2018.11.005>.
- Peterson, S. S., McIntyre, L. J., & Forsyth, D. (2016). Supporting young children's oral language and writing development: Teachers' and early childhood educators' goals and practices. *Australasian Journal of Early Childhood*, 41(3), 11-19. <http://dx.doi.org/10.1177/183693911604100303>
- Pushpa, L. (2016). Implementation of total quality management in higher education institutions. *International Journal of Scientific Engineering and Research (IJSER)*, 1(5). <http://dx.doi.org/10.3390/proceedings2211342>
- Ravindran, N., & Karpaga Kamaravel, R. (2016). Total quality management in education: Prospects, issues, and challenges. *Shanlax International Journal of Education*, 2(4), 58-65. <http://dx.doi.org/10.20968/rpm/2004/v2/i2/101074>

- Sabra, H. I., & Mohamed, S. S. (2020). Obstacles of Implementing Total Quality Management in Higher Education Institutions: Academic Staff perspective. *Assiut Scientific Nursing Journal*, 8(23), 49-61. <http://dx.doi.org/10.21608/asnj.2020.48634.1067>
- Sayed, W. S., Norman, A. M., Abdellatif, A., Abdelrazek, M., Badawy, M. G., Hamed, A., & El-Tantawy, S. (2022). AI-based adaptive personalized content presentation and exercise navigation for an effective and engaging E-learning platform. *Multimedia Tools and Applications*, 1-31. <http://dx.doi.org/10.1007/s11042-022-13076-8>
- Setiawan, A. (2019). Implementation of Total Quality Management (TQM) in Raising The Quality of Education in Private Madrasah Tsanawiyah. *JKP| Jurnal Kepemimpinan Pendidikan*, 2(2), 269-284. <http://dx.doi.org/10.2236/jkpuhamka.v2i2.4865>
- Seven, M. A. (2020). Motivation in Language Learning and Teaching. *African Educational Research Journal*, 8, 62-71. <http://dx.doi.org/10.31149/ijie.v2i5.167>
- Soltani, A., & Izquierdo, A. (2019). Adaptive learning under expected and unexpected uncertainty. *Nature Reviews Neuroscience*, 20(10), 635-644. <http://dx.doi.org/10.1038/s41583-019-0180-y>
- Spruel, L. (2020). *The Impact of Adaptive Learning Technology on Academic Achievement in a Stem Course at an HBCU Institution* (Doctoral dissertation, Southern University, and Agricultural and Mechanical College).
- Surendran, S. (2018). Application of Total Quality Management in Education-An Analysis. *IOSR Journal of Business and Management*, 20(5), 80-85. <http://dx.doi.org/10.1177/174114329001800212>
- Tomer, S., Kitts, C., Neumann, M., McDonald, R., Bertram, S., Cooper, R., ... & Yeh, T. Y. (2018, March). A low-cost indoor testbed for multi-robot adaptive navigation research. In *2018 IEEE Aerospace Conference* (pp. 1-12). IEEE. <http://dx.doi.org/10.1109/aero.2018.8396787>
- Truong, H. (2016). Integrating learning styles and adaptive e-learning system: current developments, problems, and opportunities. *Computers in Human Behavior*, 55(2016), 1185-1193. <https://doi.org/10.1016/j.chb.2015.02.014>
- Van den Branden, K. (2016). The role of teachers in task-based language education. *Annual Review of Applied Linguistics*, 36, 164-181. <http://dx.doi.org/10.1017/s0267190515000070>
- Wang, T. H., Kao, C. H., & Dai, Y. L. (2019). Developing a web-based multimedia assessment system for facilitating science laboratory instruction. *Journal of Computer Assisted Learning*, 35(4), 529-539. <http://dx.doi.org/10.1111/jcal.12357>
- White, G. (2020). Adaptive Learning Technology Relationship with Student Learning Outcomes. *Journal of Information Technology Education: Research*, 19, 113-130. <https://doi.org/10.28945/4526>
- Yakubu, M. N., & Dasuki, S. (2018). Assessing eLearning systems success in Nigeria: An application of the DeLone and McLean Information Systems Success Model. *Journal of Information Technology Education: Research*, 17, 183-203. <https://doi.org/10.28945/4077>
- Zanqar, F. S. M., Khatibi, A., Azam, S. F., & Tham, J. (2019). The Relationship between Total Quality Management and Service Quality in Higher Education of UAE. *European Journal of Human Resource Management Studies*. <http://dx.doi.org/10.29333/iji.2021.14421a>