The Effect of Flipped Classroom Strategy via Smart Phones in Academic Achievement in the English Language for Blind and Visually Impaired Students

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Abstract

This study aimed to determine the effect of flipped classroom strategy via smart phones in academic achievement in the English language for blind and visually impaired students. To achieve the goal of the study, the researcher used the quasi-experimental approach, and the study sample consisted of (18) blind and visually impaired students at the Senses Center in the city of Irbid, which consisted of (9) students of the experimental group studied using the flipped classroom strategy via smart phones, and (9) (Students for the control group, which studied using the traditional method. The results showed that there were statistically significant differences between the control and experimental groups in favor of the experimental. This study recommended holding training workshops for teachers at the institute in order to familiarize them with the importance of modern teaching methods such as the flipped classroom strategy, and how to adapt it using smart phone applications and modern technology to suit the blind and visually impaired and designing courses with exercises and models inspired by the flipped classroom, and expanding the application of such programs at all educational levels.

Keywords: Flipped Classroom, Academic Achievement, Blind and Visually Impaired Students

Introduction

Sight is one of the human's main senses for receiving signals from the outside world (Hallahan & Kaufmann, 2000). The problem of blindness or loss of vision in any individual is a cut off from the ways of communicating with this environment and learning from it (Hallahan & Kaufmann, 2000). The blind or visually impaired person seeks to compensate for this deprivation through other senses; especially the senses of hearing and touch, even if only partially (Yao & Prosper, 2011). Visual impairment loses the person most of his daily experiences related to image, color and shape and deprives him of forming a mental image of things, storing them and recalling them when needed, which is one of the most important elements of the learning process (Mboshi, 2018). According to what studies have indicated in the cognitive and educational fields, 85% of what a person learns of knowledge comes through the sense of sight (Willings, 2015). Visual disability has varying levels of severity and impact on human development.

The disability may be marked by visual impairment and may mean loss of vision and not just weakness, and in both cases, educational performance is significantly negatively affected, which means that educating students in the ordinary class without special education services and supporting services will be extremely difficult (American Foundation for the Blind, 2014). In general, there are two categories of people with visual disabilities: the blind category and the partially sighted or partially sighted category (Alkhawaldeh & Khasawneh, 2020a). From an educational point of view, students with visual disabilities, whether they are blind or visually impaired, need modifications in teaching methods, curricula and teaching aids that meet their

individual needs in various fields such as reading and writing, identification and mobility, and the development of different senses (Khasawneh, 2016; Amin et al., 2021).

The large numbers of the disabled represent an educational loss that threatens the national economy; Unless they are cared for and given attention to their education like ordinary students, and their neglect increases the problem of exacerbating illiteracy, and therefore caring for them and taking care of them has become special care of the necessary requirements (Al-Ani et al., 2020). Modern technology has been of great help to them in many areas; Rather, it made them more integrated into society, which prompted the educator to reconsider the nature of the educational situation and educational policies; In order to fit in with these rapid transformations and keep pace with the information age and the technical revolution (Hasnah et al., 2010; Manisah & Zaleha, 2012). Information technology has made possible opportunities for the visually impaired. This makes a great deal of their suffering a part of history (Khasawneh, 2021e). Consequently, some institutions working in the field of serving the visually impaired were able to find and employ means to serve the visually impaired, through the assistive technologies unit (Retorta & Cristovão, 2017).

As for the teaching strategies used, they are some of the strategies that depend on thinking, problem solving, investigation, presentation and lecture (Khasawneh, 2021b). As for teaching English, the teaching aids used are the method of dialogue and discussion, and the lecture method, in addition to using the story method and problem-solving (Khasawneh, 2021c). Despite the tremendous development in modern technologies in computers and smartphones, supported by touch, hearing and screen readers, and the ability of many blind people to access and use web networks; however, there is a dearth of studies that dealt with activating modern strategies based on modern technologies through smartphones, and activating it in educating the blind student (Karadeniz, 2018; Wagner, 2018). In light of this, this study seeks to teach a unit of study using the flipped classroom strategy via smartphones through the Internet and the (WhatsApp) program to identify its effectiveness in raising the achievement level of visually impaired students in the English language (Khasawneh, 2020f).

Literature Review

Modern communication technology has revolutionized the lives of the blind and has helped to overcome many difficulties in front of them, and many organizations that advocate the rights of the disabled have demanded the necessity of taking into account their demographic characteristics, and their equality in all educational and professional fields (Clark & Mayer, 2016). The most important of these organizations is the World Wide Web Consortium (WWWC), which has set several guidelines on making web content user-friendly for users with disabilities, in order to facilitate the display of a web browser, including YouTube and links, on all electronic devices, including mobile phones (Jakobsen & Knetemann, 2017).

The Association has developed a set of main principles for web content rules for the blind category, including that the images and multimedia used should be in alternative formats and supported by audio to facilitate description for blind users to identify their content, and that hyperlinks or Internet addresses be short and understandable when read by users with different disabilities, the maps and graphs should be concise and comprehensive so that the user can understand the intended meaning of them (Bishop & Verleger, 2013; Khasawneh, 2021d). Through these principles, the researcher tried to adapt the flipped classroom strategy through the WhatsApp application because it is easy to use and supported by audio through videos and recording (Ogden, Pyzdrowski & Shambaugh, 2014). It has developed many programs that gave the blind the opportunity to interact with the content of texts, pictures, sound, and music, among these speaking programs that made it easier for the blind to understand the contents of the mobile phone, the screen reader program (Görü-Doğan, 2015). Many companies have also provided special operating systems for the disabled, such as Skype and YouTube blind, which

has provided applications for mobile phones with Android and Apple systems (AFB Center on Vision Loss, website, 2016). Research conducted by Denis Odrow in September 2011 proved that YouTube has implemented accessibility rules for people with disabilities, as YouTube has become the most widely used network by blind people due to the simplicity of its interface and ease of use.

In this era, learners can learn regardless of place and time, the flipped classroom strategy is one of the strategies that achieve the modern learning style without there being a centralization of place and time of learning (Richardson et al., 2016; Karadeniz, 2018). The flipped classroom is a strategy for promoting advanced technology outside of class time for students in order to achieve the greatest possible degree of student participation and learning during the flipped classroom to increase efficiency in knowledge acquisition, teamwork, discussion and problem-solving (Brinks, 2014; Mahmoud, 2021). This strategy also employs electronic learning sources available online to inform students of lessons outside the classroom, and the teacher works to provide content in the form of recorded lessons, video clips, or through social networking sites and networks (Bergmann & Sams, 2012; Rahmat, 2019). In addition, this strategy revolves around student-centered learning, which is one of the active learning methods in which the teacher shares with the student, but the teacher may act as a guide and guide for the educational process (Dickenson, 2016; DeLozier & Rhodes, 2017). This strategy has the advantage of combining individual self-learning and group learning, as well as combining face-to-face and web-based learning strategies (Alzain, 2015).

Mahmoud (2021) defines the flipped classroom as a form of blended learning in which traditional classroom learning is integrated with e-learning in a way that allows preparing the lecture via the web for students to view it in their homes before attending the lecture and allocating the lecture time to solve questions and discuss projects related to the course. Bergmann and Sams (2012) also defined it as a strategy that depends on changing the nature of teaching, making the student view lessons outside the classroom via YouTube at any time and any place, and making the classroom for discussion, dialogue and homework solving. Brinks (2014) defines it as an educational model that aims to use modern technologies and the Internet in a way that allows the teacher to prepare lessons through video clips, audio files, or other media, to be viewed by students in their homes or anywhere else using their computers or smartphones before attending the lesson in when the lecture time is devoted to discussions, projects and exercises. It was also defined by Kong (2014) as the use of small and portable wireless devices such as mobile phones, smart phones and small personal tablets to achieve flexibility and interaction in the learning and teaching processes so that they take place at anytime and anywhere.

Advantages of Flipped Class

After a series of experiments and studies that applied the flipped classroom strategy, positives emerged that proved the importance of its application in the field of learning and what it can provide in this field. The positives can be mentioned according to Kong (2014) and DeLozier and Rhodes (2017) including (1) ensure good use of class time; (2) Allows students to repeat the lesson more than once based on their individual differences; (3) The teacher makes more use of the class to guide, motivate, and help; (4) It builds stronger relationships between student and teacher; (5) It encourages the better use of modern technology in the field of education; (6) The student becomes a researcher for his sources of information; (7) Promotes critical thinking, self-learning, building experiences, communication skills and cooperation among students.

Challenges facing teachers in implementing the flipped classroom strategy

Despite the many positives of flipped classroom strategies for the student, teacher, and parent, some studies, such as Zhonggen (2019) and Onodipe and Ayadi (2020), showed some challenges facing teachers and hindering or reducing their enthusiasm for implementing this

strategy. The following is a summary of the most important of these challenges from the teachers' point of view themselves.

Underestimating the importance of the teacher, as this strategy reduced his roles, but the vast majority of teachers see that only the teacher's roles have changed. After his roles were centered around giving lectures, testing students, and correcting answer sheets, he has new roles represented in preparing videos according to high technologies, with effects that help attract the student's attention, in addition to preparing activities that stimulate critical thinking and develop creativity in addition to learning activities. This is in addition to the application of higher-order thinking skills such as critical thinking and creative thinking.

The problem of infrastructure and communications, as most students do not have an Internet connection, as many regions and countries suffer from infrastructure problems, weak communication networks, and even expensive Internet subscription packages, especially in developing countries. One of the proposed solutions on this topic is to prepare the videos in advance and give them to the students in the form of an integrated file, so that he tells them the video they will watch the next day. The teacher can prepare the videos weekly or monthly, or he can prepare them for an entire class and then distribute them to the students on the storage disks for each student, in addition to the possibility of downloading them on the Internet.

Students do not prefer sitting at home in front of computer screens to watch the video prepared by the teacher, but rather they prefer to go out to the club or with their friends. For this challenge, it depends on how much suspense and excitement there is in the video itself. One of the advantages of the flipped classroom strategy is that the student can watch the videos anywhere and at any time.

The teacher does not have enough time to prepare the video, accompanying activities, and prepare for the experiments at the same time. Here we give an example of the experience of the innovators of the flipped classroom strategy, Jonathan Brigman and Sam Warson, as they shared roles, one preparing films and the other preparing activities and preparing for experiments. As the application of this strategy is for all classes they study. There are also a lot of sites that provide ready-made videos.

Previous Studies

Karadeniz (2018) created a flipped classroom-style face-to-face course and explore the impact of that course on learners' academic progress, attitudes toward e-learning, and perceptions of social presence in e-learning environments. There was no control group in this study, which was planned as a pretest/posttest. The findings revealed that the flipped classroom paradigm had a substantial impact on all three dependent variables. As a result, rather than using the conventional face-to-face learning approach, instructors may now adopt the flipped classroom model, in which students are more engaged and receive more help.

Onodipe and Ayadi (2020) described techniques for integrating smartphones into the classroom to improve teaching and learning. Using a classroom response system app, examples of creative teaching approaches to boost student knowledge and performance are presented. It is explained how to maximize the benefits of smartphone use while minimizing distractions. Exit questionnaires were used to measure students' perceptions of the usefulness of mobile technology in the classroom, and the results are presented. The findings indicate that adopting this technology improves student comprehension of course content.

Mahmoud (2021) investigated the adoption of a flipped learning technique to improve the critical reading and writing abilities of English students at the Faculty of Education. The researcher used a quasi-experimental approach to accomplish the study's goal. Sixty students were split into two groups at random: a treatment group and a control group. The treatment group got flipped learning teaching, whereas the control group received traditional education.

A critical reading and writing test were among the study's equipment. In addition, there are two important reading and writing needs assessment surveys. On the dependent variables, equality between the treatment and control groups was confirmed by comparing the means of scores using the t-test. Following the implementation of the study, post-testing was conducted, and the results were examined using both the "t-test" and the "effect size." In the post-performance of the critical reading and writing assessments, the treatment group considerably outperformed the control group. The use of a flipped learning technique was shown to be beneficial in boosting the critical reading and writing abilities of third-year English majors.

Methods

The research relied on the quasi-experimental method. Where this approach was chosen based on the experimental research method, which depends on dividing the research sample into two groups (experimental and control). Where the subjects were taught in two different ways, in the control group they were taught in the usual way with a teacher independent of the teacher who taught the experimental group that was taught using the flipped classroom strategy based on the achievement test (pre and post) for both groups.

Population and Sample research

The study population consisted of blind and visually impaired students registered in special education centers in the Irbid governorate, and their number, according to the statistics available to the Ministry of Education, was (79) students. The process of searching for the center in which the experiment is to be applied was carried out among the special education centers in terms of the availability of technical requirements in terms of equipment and internet service. The students of the Senses Center were chosen as a representative sample after making sure that the students of the center had the necessary components, techniques and devices to achieve the objectives of the study. The sample number reached (18) Students were divided into two groups equally.

Research Instruments

The current research relied on the achievement test that was designed to determine the effectiveness of applying the flipped classroom strategy on the academic achievement of blind and visually impaired students in English language. The achievement test was established after reviewing the previous literature, and it consisted of three dimensions: analysis, synthesis and evaluation. The achievement test consists of (6) questions containing (19) items, in the type of objective test.

The tutorial has been built taking advantage of the standards set by the World Wide Web Consortium (WWWC), on making web content accessible to users with disabilities, and many countries have imposed rules on the provision of web content for people with disabilities (WCAG) in the name of accessibility. Accessing WhatsApp and other programs that support touch and voice in smart phones, through screen readers using advanced technologies (Media Access Australia & Hollier, 2012), with reference to the standards of designing the flipped classroom and what it requires to provide a flexible learning environment, with reference to the chapter on special education in (NGSS), which stipulates the need to avoid the large number of texts, and to simplify the scientific concepts of this category (Lee, 2014), and by referring to books, research and studies specialized in flipped classes in particular, and teaching, educational and training bags. And with reference to books, research and studies Specializing in flipped classes in particular, and teaching, educational and training packages, and with reference to the Aljazaar model of educational design, which aims to help student teachers and researchers to develop lessons and educational units as an effective system to suit e-learning, this program has been formulated.

Research Procedures

The research was carried out by following these steps:

First, the analysis stage:

Under it falls the development of standards for the e-learning environment, and the e-learning environment in this study is the design of the flipped classroom via smart phones, taking into account the design criteria are (1) Standards that relate to the concept, construction standards, writing and editing standards and ethical standards; (2) Analyzing the basic characteristics of the target learners, their previous learning, the required learning, informational and cognitive skills, and their effectiveness; (3) Determining the educational needs and skills required to be conveyed to the learners; (4) Determine the available resources that can be used, represented in smart phones.

Second, The design stage:

(1) Develop educational objectives in the form of ABCD; (2) Determining the content elements for the unit's educational objectives. Where the researcher identified the content elements that achieve the desired educational goals, through which the unit can be taught, and they were represented in audio, videos, audio recordings, and links extracted from search engines; (3) Designing learners' experiences: resources, activities, interaction (individual/group), links and connections; (4) Selection of media elements and educational materials where the researcher downloaded the appropriate information from the Internet, pictures and maps and adapted them to the blind through description and audio explanation. The researcher used the search engines most used by blind students (Google - Yahoo), books, external references and textbooks, and also downloaded ready-made videos suitable for the lessons of the educational unit via YouTube, which achieved the second rate of use by the blind student. The researcher also used the icons in the WhatsApp program to shoot videos of the lessons of the educational unit, send and share them with the experimental group, as well as audio clips prepared by the teacher to explain the lesson and clarify the mysterious points. Emphasizing the important points in the lesson, in order to achieve the educational goals and appropriately for the target group; (4) Script design for the selected media; (5) Identification of simultaneous communication tools inside and outside the environment: communication within the group that created the flipped row via direct messages in the WhatsApp program, and outside by e-mail.

Third: The stage of production and construction:

Production of the e-learning environment: where the researcher used smart phones, and the WhatsApp program was downloaded on all phones of the experimental group, and a group was created on the WhatsApp program in which all the students added the experimental group.

Fourth: Evaluation stage:

Presentation of the flipped class group in the WhatsApp program via smart phones to a group of arbitrators specialized in the field of educational technologies, curricula and teaching methods for the blind and application of the flipped classroom strategy via smart phones on a group of learners.

Fifth: The stage of use:

Field use of the strategy via smart phones at home and the stage of feedback in the school classroom.

Sixth: Implementation Steps:

Training the students on using search engines and YouTube, and interacting in the Flipped Classroom group in the WhatsApp group via smart phones. Clarify to the students that they are learning according to the flipped classroom pattern through smart phones, where the student

learns independently at home and then interacts with peers through the WhatsApp group. Emphasis on students to benefit from the information, links, videos and audio recordings sent via smart phones via WhatsApp, and to participate, interact and discuss with the teacher and with their peers in the group in the scientific material. Clarify to the students that an individual achievement test will be applied to each student after completing the study using the flipped classroom strategy via smart phones. Application of the research tools remotely: After the end of the research experiment, which amounted to (a month and a half), the researcher applied the research tools represented in the achievement test, and the grades were monitored for all students.

Results and Discussion

To answer the question of the study, which states what is the effect of using strategy of the flipped classroom via smart phones in academic achievement in the English language for blind students in Irbid Governorate? The post achievement test was applied to the control and experimental groups after the study completion of the unit from the English curriculum, then the means and standard deviations were calculated for the academic achievement of the two study groups, as well as the t-test for the two independent samples to calculate the significance of the differences between the means of the control and experimental groups in the post-achievement test and to calculate the effect size and level according to Cohen's classification.

Table 1. T-test results

Subject	Groups	N	Mean	St.d	T (value)
English	Control	9	9.89	3.36	18.25
	experimental	9	14.25	3.52	

Table (1) shows that there are statistically significant differences between the control and experimental groups in favor of the experimental, and this result indicates the effect of using the strategy of the flipped classroom via smart phones in academic achievement in the English language. This result is in agreement with the studies of Karadeniz (2018), Onodipe and Ayadi (2020) and Mahmoud (2021). The improvement in the achievement level of students with blind disabilities in the English language is due to the use of the flipped classroom via smart phones. Because most of the blind sample use a smartphone; Because of its advanced operating system and other advantages for browsing the Internet by touch and equipped with a screen reader program, and the ease of synchronization with modern, easy-to-use and most enjoyable applications such as the WhatsApp application. It was successful and was widely accepted by blind students due to the availability of the technology required in the study, the ease of access to the scientific material used in applying this strategy, including videos and audio clips, the ease of using different search engines to obtain information, sending and reading it by the blind student, and the ease of interaction between the teacher and the student, and between the student and his peers through the group created via the WhatsApp program and the ease of sending messages, audio clips and videos. The guardian also benefited from this strategy by having a direct and quick communication method between him and the teacher, and the guardian was activated to participate in the educational process, through Enter it in the educational groups established via WhatsApp and receiving all new explanations of the curriculum lessons and duties activities and the purpose of this is to guide the student at home with the obligation to prepare and follow up via smart phones and under their supervision.

Conclusion

The study revealed the importance of using the Internet for the visually impaired from the teachers' point of view, and the study concluded that teachers see that the use of the Internet is more important for the visually impaired individual, because it allows him to use various means that provide him with flexibility, and help him learn without being restricted by time and place,

and that using the Internet The Internet enables the visually impaired to obtain various sources of knowledge in terms of quantity and quality, and saves effort and money. Flipped classroom is the replacement of traditional learning with educational videos that students learn before entering the classroom, and then ask them to enter the classroom ready to solve activities or practical exercises in the form of projects or solve problems related to the video they have learned to come ready. Flipped classrooms are that students with achievement difficulties receive the most help. Several recommendations are worth considering. This includes holding training workshops for teachers at the institute in order to familiarize them with the importance of modern teaching methods such as the flipped classroom strategy, and how to adapt it using smart phone applications and modern technology to suit the blind and visually impaired. Conducting other research on the effectiveness of a program based on flipped classrooms in developing other skills, such as self-learning, problem solving, inquiry, self-regulated learning, and metacognitive and creative thinking. Designing courses with exercises and models inspired by the flipped classroom, and expanding the application of such programs at all educational levels. Include teacher preparation programs, training on the flipped classroom strategy.

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