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The Impact of Control Pattern Difference in Mobile Applications on Developing Cognitive achievement among Students with Learning Disabilities at the Primary Level

Mazen Mohammed Mutad Alsurayhi

Faculty of Educational Graduate Studies || King Abdulaziz University || KSA

Abstract: This research aimed to identify the impact of control pattern difference in mobile applications on developing cognitive achievement among students with learning disabilities at the primary level. The research problem can be summarized in the following main question: What is the impact of control pattern difference in mobile applications on developing the cognitive achievement among students with learning disabilities at the primary level? The researcher used the quasi-experimental method to answer the main question of the research. The experiment was divided into two experimental groups: the first group was subjected to a study with the program control pattern in Mobile applications, and the second group was subjected to a study with the learner control pattern in Mobile applications. The study tool is the achievement test. The research sample consisted of (8) students with learning disabilities in the alphabets at the primary level. The results of the study found that there were statistically significant differences of 0.05 between the average results of the two experimental groups in the cognitive achievement test due to the impact the control pattern difference in mobile applications (program control pattern, learner control pattern) in favor to the program control pattern group. The researcher recommends using the mobile applications with program control pattern while providing alphabets lessons to students with learning disabilities and directing future researches on mobile applications to study the different control patterns and their relevance to ordinary students and special education students.

Keywords: mobile applications, control pattern, learning disabilities, alphabets, cognitive achievement.

أثر اختلاف نمط التحكم في التطبيقات النقالة على تنمية التحصيل المعرفي لدى طلاب صعوبات التعلم بالمرحلة الابتدائية

مازن محمد معتاد السريحي

كلية الدراسات العليا التربوية || جامعة الملك عبد العزيز || المملكة العربية السعودية

المستخلص: استهدف البحث الحالي التعرف على أثر اختلاف نمط التحكم في التطبيقات النقالة على التحصيل المعرفي لدى الطلاب ذوي صعوبات التعلم بالمرحلة الابتدائية، وتلخصت مشكلة البحث في التساؤل الرئيسي التالي: ما أثر اختلاف نمط التحكم في التطبيقات النقالة على تنمية التحصيل المعرفي لدى طلاب صعوبات التعلم بالمرحلة الابتدائية؟ ولتحقيق أهداف البحث استخدم الباحث المنهج شبه التجريبي والذي يعتمد على اجراء التجربة على مجموعتين تجريبيتين تخضع المجموعة الأولى إلى الدراسة بنمط تحكم البرنامج في التطبيقات النقالة والمجموعة الثانية بنمط تحكم المتعلم. وبعد الاختبار التحصيلي هو أداة الدراسة. وتكونت عينة البحث من (8) طلاب من طلاب صعوبات التعلم في الحروف الهجائية في الصف الثاني الابتدائي. وتوصلت نتائج الدراسة إلى وجود فروق دالة احصائياً عند مستوى (0,05) بين متوسط درجات طلاب المجموعتين التجريبيتين في اختبار التحصيل المعرفي ترجع للتأثير الاساسي لاختلاف نمط

التحكم في التطبيقات النقالة (تحكم البرنامج، تحكم المتعلم) لصالح المجموعة التي درست بنمط تحكم البرنامج. واستنادا للنتائج أوصى الباحث بتفعيل استخدام التطبيقات النقالة ذات نمط تحكم البرنامج عند تقديم الدروس المتعلقة بتعلم الحروف الهجائية لذوي صعوبات التعلم والمعارف ذات الجزيئات الصغيرة المترابطة، وتوجيه الأبحاث العلمية في التطبيقات النقالة لدراسة الأنماط المختلفة داخلها وملائمتها لمختلف الطلاب العاديين والتربية الخاصة بشكل عام.

الكلمات المفتاحية: التطبيقات النقالة، نمط التحكم، صعوبات التعلم، حروف الهجاء، التحصيل المعرفي.

Introduction.

Overview:

With the fast spread of mobile devices worldwide and the huge number of applications with multiple provided services. These applications face a lot of problems by providing solutions that would make individuals more adaptable to the economic and social requirements of the community. Education is one of the most important fields, where the mobile applications can be used in all educational institutions and at all levels. As a result, the concept of mobile learning appeared, which depends on using portable digital devices that are connected with networks wirelessly to practice different educational activities regardless of time and place (Al-Halfawi, 2011). Also, learning using mobile applications achieves interaction and flexibility in the teaching field. (Al-Dahshan & Younis, 2009)

These applications have become widely used in the education field, and it is not limited to ordinary students but extends to other special education students who are part of School students in the Kingdom of Saudi Arabia.

Learning disabilities term is one of the special education categories, it is defined as a wide range of developmental delays (whether in speech, language, or other disabilities) that affect the academic development of students, such as reading, writing, and mathematics (Selenkas et al., 2010). Therefore, students with learning disabilities need special teaching methods that differed from ordinary students which suit their situation. As a result, mobile applications can be used in teaching students with learning disabilities by providing the content in different ways that fit the disability type they suffer.

The mobile applications used in teaching students with learning disabilities include many variables, some depend on the user interface, and others depend on the contained media, including the related control pattern.

The control pattern (learner control pattern, program control pattern) is one of the design variables in mobile applications, the learner control pattern is defined as the pattern that gives learners the right to make educated decisions so that they can change the level of difficulty, request additional help, change the amount of training, and control the sequence of content to meet their needs in the educational programs. (Azmi, 2000)

The program control pattern, defined by Azmi (2000) as "the pattern that gives the learner the right to determine the time that is sufficient for him/her to learn, and to choose the sequence that suits

him/her during his/her study, also to determine the training amount that suits his/her achievement level, and his/her control on the feedback request.

The rest of the studies; Al-Ghamdi (2014), Al-Nashiri (2012), Tabbers and Koeijer (2010), and Al-Zahrani (2014) studies did not agree in determining the most appropriate mobile control pattern, where it was noted that these studies limited to computer applications.

This research is an attempt to identify the impact of control pattern difference in mobile applications (learner control pattern, program control pattern) in developing the cognitive achievement of students with learning disabilities at the primary level.

Research Problem:

Through the researcher's work as a teacher for students with learning disabilities and his use of mobile applications in teaching these students, and regarding previous studies such as Basoglu and Akdemir (2010), Chen and Lever (2004), Motiwalla (2007), and Wentzel (2005) studies that confirmed the effectiveness of mobile applications in the education field. These applications have many control patterns and through the researcher's examination of some applications in IOS and Android platforms, which are (teaching the alphabets with sound, letters, and numbers for children), that provided to students with learning disabilities, as these applications depended on the program control pattern and the learner control pattern.

Depending on the researcher's knowledge no study dealt with the control pattern difference in mobile applications, so this study will search for the most appropriate control pattern in mobile applications to develop the cognitive achievement of students with learning disabilities, that may help in developing their reading skills.

Research Significance:

1. This research integrates with the direction of the Ministry of Education in the Kingdom of Saudi Arabia, to focus on caring for students with learning disabilities by using new technologies.
2. The results of the research can help the teachers of students with learning disabilities in choosing the appropriate mobile applications for teaching different lessons.
3. Directing education officials to the importance of mobile applications in the educational field.
4. This research is a response to the recommendations of previous studies on the program control pattern. Such; Abdel Rahim (2012), Ismail (2014), and Al-Ghamdi (2014) studies.

Research Scope and Limitations

- Human limits: Students of Al-Waleed Bin Qais Primary School in Jeddah, Kingdom of Saudi Arabia.
- Time limits: The second academic year 1440 AH, 2018 AD.
- Spatial limits: Al-Waleed bin Qais Primary School in Jeddah Governorate.

- Subject limits: The current research is based on the alphabet.

Research Hypothesis:

It is hypothesized that there are no statistically significant differences at the level of 05.0 between the average results of the student in the two experimental groups due to the impact of control pattern difference (program control, learner control pattern) in mobile applications.

Research Procedures:

1. Reviewing previous studies and literature related to the research variables.
2. The educational design of the application, which will be according to the model of Al-Jazzar (2013) for its flexibility and relevance to the nature of the research procedures, is in line with the innovations of electronic-learning, and distance education.
3. Preparing the study tools and verifying their validity and reliability.
4. Choosing the study sample, and dividing it into two experimental groups.
5. Applying the research tool to the groups
6. Implementing the experimental treatment material.
7. Post applying of research tool on the groups.
8. Monitor results and give recommendations.

Theoretical Framework.

Mobile Applications:

The term mobile learning refers to the use of mobile applications in mobile devices in the educational field. Mobile learning is one of the modern terms that appeared recently, related to electronic-learning and distance learning. It can be stated that mobile learning is that educational pattern, which depends mainly on using available technologies in wireless devices to carry out the teaching and learning processes outside classrooms, where this method suits the different conditions.

The changing process of education has been affected by the phenomenon of technological development and this is achieved by using portable computer devices and mobile devices such as smartphones and laptops, tablets, and digital assistants (PDAs), which are equipped with modern communication, both wired and wireless, that helps to facilitate the exchange of information between students themselves or between students and the teachers. (Al-Dahshan & Younes, 2008)

What makes using mobile applications important is the increasing number of mobile devices, and the multiplicity of services provided by these devices that can be used to face a lot of problems in the education field, such as the plenty of information, the increase in learners number of, the lack of teachers, distances, and making the education an enjoyable process. Mobile learning has changed the students'

daily routines from carrying books, pens, and papers to carrying digital information and communications technology, to support the spread of learning materials to learners inside and outside classrooms.

Definition of Mobile Learning:

Mobile learning is a modern field, appears in different and multiple definitions, as follows:

- Badr (2012, P.185) defines mobile learning as: "The learning that takes place using the mobile phone with what it provides such SMS, MMS, WAP, Bluetooth, and other services.
- Harriman (2011,P.49) indicated that the term mobile learning is the use of mobile devices, such as mobile phones, PDAs, portable computers, and other portable devices in education and learning.
- Rogers (2011, P.6) defined mobile learning as providing learning anytime and anywhere using wireless devices. using small and hand-held mobile phones, PDAs, and Tablets.

Types of Mobile Applications

The forms of mobile applications vary according to which devices they are used in, (Al-Omari, 2014) identified these devices as follows:

- Mobile Phones: A mobile or cellular is one of the communication averages that rely on a Wireless network. It can be carried and roamed within a specific area covered by the broadcast network.
- Tablet PC: A type of computer, its size approximately equal to the palm-size It is used to store and display texts and multimedia, and it can be used as a computer.
- Laptop: A type of computer, it is slightly larger than the tablet and it has the same features. However, its storage capacity may be more than that of a tablet.
- Personal Digital Assistants (PDAs): Portable computer devices that are used to store and organize data, organize personal appointments, prepare lists of personal tasks, write notes, run text formatting programs, spreadsheets, games, read electronic-books, connect to the Internet, and send and view e-mail messages.

Benefits of Using Mobile Applications in Education:

Al-Senussi (2013, P.158) indicated that mobile applications have many advantages that are useful in the educational field, including:

1. Broadcasting lessons and lectures directly through the Internet, and the interaction between teacher and student through the application.
2. Receiving and delivering, discussing, and editing home works.
3. Help students and teachers to create a small library of contains related materials to the courses.
4. Direct communication between the educational staff and students' parents, so parents can follow up on their children's attendance, results, level of cognitive achievement, and others.

5. Expanding the student's learning circle from limited time and place to every time and everywhere.
6. Mobile applications provide opportunities for traditional learning outside classrooms, that allow learners to continue their education while on their job.
7. Adding a variety of activities to the traditional lessons break the psychological barrier towards the scientific material and make it more attractive. (Ibid)

Mobile Application Control Patterns:

The control pattern in mobile applications is one of the variables affecting the educational design of these applications because this variable largely determines the form and effectiveness of the application in the educational field. Naidu (1995) defines it as the different forms of control levels in the learning environment that suiting the educational needs of learners to be able to interact with knowledge in different ways.

- Program control pattern

Singhanayok and Hooper (1998, P.22) defines the program control pattern as the method used by the application to organize and arrange the information and data presented to the learner so that the application controls the flow and modification of information and data by itself without the learner's intervention.

Azmi (2000, P.21) defines the program control pattern as "the application's control in the learning time, the sequence of content, the amount of training, and providing feedbacks automatically according to specific criteria that are imposed on the learner.

Aly et al. (2005, P.158) defines the program control pattern as a type of control that includes educational elements and events that are presented to learners in a linear and fixed path, where learners cannot interfere in their arrangement or change them.

- Learner control pattern

Azmi (2000, P.23) defines the learner control pattern as "the pattern that gives the learner the right to determine the sufficient time for him/her to learn, choose the sequence that suits him/her during his/her study, and to determine the amount of training that suits his/her level of achievement." Carrier et al. (1985) stated that the term learner control pattern is the pattern that allows the learner to control the application and make his/her own decisions about the exercises that should be reviewed.

Students with Learning Disabilities:

Learning disabilities is a general term that describes a group of students in a classroom. They show lower academic achievement than their normal colleagues, even though they have an average or above-average of intelligence, but they face difficulties in some skills related to learning such as

understanding, thinking, perceiving, paying attention, reading, writing, spelling, pronunciation, or performing some mathematical. (Al-Welily, 2010)

Ibrahim (2007, P.49) defines the students with learning disabilities as a heterogeneous group of individuals with an average or above average of intelligence, they show a clear divergence between their expected performance and their actual performance in one or more academic areas, their disabilities may be due to disturbances in their cognitive skills.

The term learning disability is used to describe a person who has an unexplained disability, a person of average intelligence in receiving basic academic skills. The main learning disability is information processing; (Harish et al., 2013).

The researcher believes that learning disabilities can be defined as a set of clear and tangible symptoms for a specific group of students who do not have sufficient awareness of their surroundings; which shows their suffering of low achievement or cognitive problems.

The Importance of Using Mobile Applications in Teaching Students with Learning Disabilities:

It is common knowledge that students with learning disabilities differ from ordinary students, where they do not benefit from the traditional methods that are used in teaching. Therefore, to teach these students, it is necessary to use special and diverse teaching strategies and methods that take into account their special needs Mekhlif (2010, P.591) explained that modern teaching methods and strategies play important role in developing the educational level of students with learning disabilities. This importance can be concluded in the following points:

- Achieving equal learning.
- Providing an opportunity to engage in public life.
- Achieving good learning opportunities .
- Getting rid of the negative feelings.
- Discovering their abilities and potentials.

Wyatt-Smith (2011) stated that several studies have proven the feasibility of the technology in helping students with learning disabilities in different ways, for example, students with reading disabilities may see them surprisingly read well on the Internet, where, many students with reading disabilities may be able to make important decisions in online reading and accessing useful digital features.

Mobile learning provides several opportunities for students with learning disabilities. It has allowed teachers who are either at home or school to help students with learning disabilities in their learning environment, i.e. through mobile applications, students with learning disabilities can deal with information that allowed them to communicate (Starrick & Niskala, 2010).

It is clear from the above that mobile applications help students with learning disabilities to enhance their memory skills; where it helps them to overcome short-term memory problems, and

facilitate all the processes that occur in memory from encoding, storage, and retrieval. (El-Deeb et al., 2011).

Previous Studies:

Al-Ghamdi (2014) prepared a study entitled: "The impact of the interaction between the educational control pattern in multimedia software and the cognitive pattern to learn programming skills for secondary level students." This study aimed to reveal the impact of the interaction between the educational control patterns (learner control pattern- program control pattern) and the cognitive patterns (dependence - independence) in the programming skills of secondary level students. The researcher chose a sample of 60 students and prepared an achievement test for the cognitive aspect and observation cards to test students' programming skills. The study concluded that there were no statistically significant differences between the average scores of the experimental groups due to the main impact of the educational control pattern. The study recommended that the multimedia courses should include the two controls patterns .

Al-Nashiri (2012) prepared a study entitled: "The impact of different educational control patterns using multimedia programs on the achievement of chemistry for secondary level students." This study aimed to identify the impact of the educational control pattern in multimedia programs in determining the most appropriate educational control methods for secondary level students, the researcher selected a sample of 60 secondary level students and divided them into two groups. The results of the study showed that there were statistically significant differences at the level (05.0) between the groups in favor of the group that studied in the learner's control pattern. The study concluded that the most important pattern to rely on is the learner's control pattern.

Tabbers and Koeijr (2010) prepared a study entitled: "Learner's Control of Motion Graphics." This study aimed to find the effectiveness of learner control in multimedia computer programs, through the comparison between student education in the program control pattern and the learner control pattern, the research sample consisted of 52 university students with an average age of 22 years. The results of this study indicated that the preference was to the learner control pattern, the study showed the importance of introducing a learner control pattern in computer programs based on motion graphics.

Mabrouk (2009) prepared a study entitled: "The Effectiveness of Controlling patterns in presenting the Educational Computer Programs for Developing Scientific Thinking of Secondary Level Students." This study aimed to identify the optimal method for controlling multimedia computer programs (learner control versus program control), the results of this study showed that there were no statistically significant differences at the level (05.0) between the average scores of students who were exposed to multimedia programs. as a result of the control pattern difference.

Research Methodology.

The researcher has chosen the quasi-experimental method, which is based mainly on "studying human phenomena as they are without change" (Al-Assaf, 2011, p. 292) to explore the control pattern in mobile applications for teaching students with learning disabilities. The experiment includes two experimental groups for an independent variable that presented in two types: the program control pattern, and the learner control pattern. The experiment aimed to explore the impact of control pattern difference in mobile applications on the cognitive achievement of students with learning disabilities in the primary level.

Research Variables:

This research included one independent variable, which is the control pattern in mobile applications, and it is presented in two types. The first type is the learner control pattern, where the learner controls the format, method, and duration of his/her learning, also he/she is responsible for all related decisions to the application. The second type is the program control pattern, where the program controls the learning time, the content sequence that developed by the developer, the application is designed according to the desired goals without the intervention of the learner. The research also included a measured dependent variable which is the cognitive achievement, that measures the cognitive achievement of students with learning disabilities in reading the alphabets.

Preparation of Research Tool:

An achievement test was prepared by the researcher in the alphabets unit and it was prepared according to the following steps:

- Determine the test goal

The achievement test was prepared to measure the students' achievement of the two experimental groups to determine the impact of the control pattern difference in developing the students' cognitive achievement using mobile applications.

- Preparation of the test draft

The researcher analyzed the content of the alphabets unit, to find out the cognitive objectives and then formulate the test content in (28) questions that equal the total number of the alphabets.

- Test format

The achievement test was formulated to recognize the letters of the alphabet when indicated.

- Test correction method

To ensure the objectivity of the test correction, the researcher put one point for each correct answer, and zero points for each wrong answer, so that the total score of the test is 28 points. After the test, the students were asked about the test clarity and they agreed that the questions were clear.

- Test validity:

The first draft of the test was presented to a group of specialized arbitrators to ensure the validity of the test content, the authenticity of its content from a scientific and linguistic point of view, its suitability to the student's level, and the extent to which its vocabulary is related to the study content. Therefore, some of the phrases were reformulated depending on the arbitrators' recommendations so that the test became more applicable in its final form.

- Calculation of test stability coefficient

An exploratory test was applied to measure the degree of stability on a sample of students with learning disabilities to calculate the Stability coefficient using Alpha's Cronbach's coefficient (Tavacol, 2011), which reached a correlation degree of (762.0), so, the test has a high degree of stability, with the previous procedures, it became possible to experiment.

- Calculation of test difficulty and ease coefficient:

The ease coefficient was calculated for the test content, the ease coefficients for the test content should range between (2,0) and 8.0 which averages that the questions with an ease coefficient of more than 80% are considered very easy, and the questions that reach an ease coefficient of Less than 20% are considered very difficult (Harriman, 2011). After calculating the ease coefficients of the achievement test, it was found that the coefficients of difficulty ranged between (67%) and (33%) so that all the content of the achievement test falls within the accepted range, so it is not very difficult and not very easy.

Preparation of the Research Sample:

The sample of the research consisted of students with learning disabilities of the second grade of the primary level at Al-Waleed bin Qais Primary School, at the beginning of the second semester of the 1438 AH 1439 AH academic year, and their number was 8 students who suffer learning disabilities in the alphabets. The sample was divided into two groups, each group has a different control pattern. Table (1) describes the research sample.

Table (1): description of research sample in terms of control pattern and students number

Group	Number
Learner Control	4
Program Control	4
Total	8

The Pre-application of Research Tool:

After preparing the research tool and selecting the sample, and before starting the research experiment, the achievement test in the chosen topic (alphabets) was applied to all members of the

research sample in both experimental groups, to determine the degree of the pre-application for each student and thus measuring the homogeneity of the two groups.

Homogeneity of the Experimental Groups

The student's scores were calculated, and the data was unloaded in preparation for its statistical processing using the SPSS program to measure the differences between the scores of the two experimental groups, as well as to use these scores after the post-application of the achievement test. The researcher applied the Man Whitney test for small samples, (Nashar, 2008) on the average students' scores of the two experimental groups in the pre-application, the following table shows the results:

Table (2): Results of the Mann-Whitney (U) for the difference between the average scores of the students of each experimental group in the pre-application of the achievement test

Group	Number	Score Average	Standard Deviation	Function Degree	U Value	Indication level
Program Control	4	4.85	1.972	0.726	7.00	Non function
Learner Control	4	4.25				

From table (2), is clear that the value of (U) which is expressed by the degree of significance is equal to (726.0) between the two groups in the pre-application of the achievement test, which averages that it is greater than the level of (05.0), which confirms that it is not a statistical function and this averages that the two groups are homogeneous, and that confirms that any impact on the difference in the average scores of the post-application will be due to the control pattern difference.

Preparation of the Experiment:

- The first experimental group (Program Control Pattern)

Sample: 4 students

Requirements: Each student studies the alphabets through the mobile application with the program control pattern in the classroom and at home, for 8 days.

Experiment steps:

1. A sample of 4 students with learning disabilities in the second grade of the primary level was selected.
2. A video of how the application works and how to use the program control pattern has been sent to students' parents to use at home.
3. The student was trained on using the pattern in the resource room.
4. The student was divided into two groups, each group consists of two students.
5. The groups were taught the alphabets on mobile devices, a device for each student for two weeks, with one class per day for each group.

6. The student was given a post-test.
7. The results and statistics were sorted and written.

Figure 1: Application interface in program control pattern

- The second experimental group (Learner Control Pattern)

Sample: 4 students

Requirements: Each student studies the alphabets through the mobile application with the learner control pattern in the classroom and at home, for 8 days.

Experiment steps:

1. A sample of 4 students with learning disabilities in the second grade of the primary level was selected.
2. A video of how the application works and how to use the learner control pattern has been sent to student's parents to use at home.
3. The student was trained on using the pattern in the resource room.
4. The students were divided into 2 groups, each group consists of two students.
5. The groups were taught the alphabets on mobile devices, a device for each student for 8 days, with one class per day for each group.
6. The student was given a post-test.
7. The results and statistics were sorted and written.

Figure 2: Application interface in learner control pattern

The Experiment Implementation

The experiment was done through the following stages:

1. Applying the cognitive achievement pre-test on the two experimental groups.
2. Hold an introductory meeting with each student separately to clarify the use of the application according to the chosen control pattern for each group.
3. Send the application to the student's parents and communicate with them to explain its use according to the chosen pattern for each student regarding his group.
4. Teaching the student by the application for 8 days, a class each day for each group.
5. Daily follow-up the implementation of the experiment at home through communication with parents.
6. Encouraging students to use the application according to the pattern of each group, and strengthen students morally and materially through the reinforcement corner in the resource room.
7. The post-application of the cognitive achievement test on the two experimental groups.

Post-application of the Research Tool:

After the completion of teaching the alphabets to all students, the achievement test was applied to the two experimental groups, to determine the post-test score for each student in the two groups, then the student's scores and data were unloaded in preparation for statistical processing.

Used Statistical Methods:

The following methods were used:

- Applying the Mann-Whitney (U) test for independent small groups to measure the average scores of the students of the two experimental groups (Nashar, 2008)
- Calculating the stability coefficient using Alpha s' Cronbach's coefficient. (Tavakol, 2011)
- Calculating the ease and difficulty coefficient for the achievement test.

Research Results.

In this section, the results of the research will be presented, by testing the validity of the research hypothesis, and measuring the impact of control pattern difference in mobile applications in developing the cognitive achievement of students with learning disabilities at the primary level, then interpreting and discussing the results, and providing several recommendations and suggestions in the light of the results.

Equivalence of the Experimental Groups:

The researcher used the nonparametric method through the Mann-Whitney (U) test to indicate the differences between the average of small independent groups.

Table 3: Results of the Mann-Whitney (U) test for the differences between the average scores of the experimental groups in the pre-measurements and their significance in language skills

Group	Number	Score Average	Standard Deviation	Function Degree	U Value	Indication level
Program Control	4	4.75	1.972	0.762	7.00	Non function
Learner Control	4	4.25				

From table (3), it can be noted that there are no statistically significant differences at the level of (0.05) between the average scores of the members of the two experimental groups, where the calculated value of (U) reached (7.00) when applying the achievement pre-test, which averages that the two groups are equivalent and if any differences appear after the experiment will be due to the difference in the independent variable, and not to differences that already existed before experimenting the groups.

Hypothesis Validity Test

The research hypothesis states that there are no statistically significant differences at the level of 0.50 between the average score of the students of the two experimental groups, due to the control pattern difference (program control pattern, learner control pattern) in mobile applications. To test the validity of the hypothesis, the researcher used the Whitney-Mann (U) test to measure the differences between the average scores of the experimental groups, the following table shows the results:

Table 4: Results of the Mann-Whitney (U) test for the differences between the average scores of the experimental groups in testing the validity of the hypothesis

Group	Number	Score Average	Standard Deviation	Function Degree	U Value	Indication level
Program Control	4	6.50	4454	0.021	0.00	Statistical function
Learner Control	4	2.50				

From table (4), it is clear that the value of (U) for the average scores of the achievement test is a function at level (0.01), this averages that there are statistically significant differences between the two groups in the post-test in favor of the first experimental group which was studied the program control pattern.

Therefore, the researcher will reject the hypothesis, which states that there are no statistically significant differences at the level (0.05) between the average scores of the two experimental groups in the cognitive achievement test due to the main impact of control pattern difference (program control pattern, learner control pattern) in mobile applications. Also, the researcher will accept the alternative hypothesis, where the results indicated that there were statistically significant differences at (0.01) level between the average student's scores in the post-measurement of the cognitive achievement of the alphabets, the alternative hypothesis was stated that there are statistically significant differences at the

0.05 level between the average scores of students in the two experimental groups due to the impact of the control pattern difference (program control pattern, learner control pattern) in mobile applications.

Previous studies have proven the effectiveness of using mobile applications in developing the students' cognitive achievement, such as Salama (2014), Rismark and Sølvberg (2012), Basoglu and Akdemir (2010), and Motiwalla (2007) studies. The development of cognitive achievement can be attributed to the fact that mobile learning provides the advantage of learning in any place and at any time, due to the flexibility and dynamism provided by mobile learning which gives the learner more flexibility in learning and makes him/her free to interact inside and outside the classroom. Also the ease of transferring the educational material due to the lightness of mobile devices and student's knowledge of dealing with mobile devices greatly spread.

Interpretation and Discussion of Research Results:

The results of this study showed that the use of mobile applications in the program control pattern is better than using them in the learner control pattern. In developing the cognitive achievement of students with learning disabilities, this result agrees with Al-Ghamdi (2014), Abdo (2005), Hanavin and Sullivan (1996), and Naidu (1995) studies, that showed the effectiveness of the program control pattern in the cognitive achievement.

This result is due to the easier use of the mobile application in the program control pattern, where in this pattern the application acts on behalf of the student in making decisions and leaves the learning tasks.

The efficiency of learning decreases in the learner control pattern due to the increasing number of elements on the screen, which c confuses the learner when he/she will be responsible for making decisions which would distract his/her attention and direct most of his/her focus and energy in making the learning decisions and not to the learning itself, (Zaher, 1997). This result agreed with Ozabl's theory of development as the theory found that the learner in the learning process is the receiver and that the control of the software must be educated through the teacher or application. (Abdo, 2005)

Research Recommendations.

1. Directing future researches in mobile applications to study the different patterns of control and their suitability for different students.
2. Activating the use of mobile applications with a program control pattern when providing lessons related to the alphabets .
3. Conducting studies concerned with developing and designing special educational applications to suit students with learning disabilities.

4. Conducting a study to reach some criteria to effectively employ mobile applications in the educational field for students with learning disabilities.
5. To benefit of previous studies on control patterns in computers to find suitable criteria for designing educational mobile applications for students with learning disabilities.

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