King Abdulaziz University
Faculty of Computing and Information Technology
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iEN Bag

CPCS 381 – Human Computer Interaction

Course Project – **Phase I**

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PHASE I

1. Introduction

The importance of e-learning and distance education has increased, especially considering the crises that the world is experiencing, including the Corona virus pandemic today, which has forced millions of students to drop out of schools, and online education has become the most appropriate and safest solution. One of the modern e-learning methods launched by the Ministry of Education in the Kingdom of Saudi Arabia is the (iEN Education Portal), which includes its own iEN Bag app.

1.1 Background

"iEN Bag": is an application for smart devices that contains all Saudi k12 textbooks in a digital form supported by supplementary and supportive educational materials. This Application includes the following features:

- Download and brows all k12 textbooks and teachers' guides.
- Content tailored to students' interest and their educational level.
- Attractive design for students.
- Browsing all related educational digital content to support learning progress and interactivity.
- Self-assessment tools by using Questions-Pool from iEN platform.
- Provision of instant and prompt educational support for students by qualified teachers.
- Interaction features with the digital textbooks.

1.2. Target Users

The target users are students and teachers in Saudi Arabia in all education systems primary, middle, and secondary public education, early childhood, special education centers, Saudi schools abroad, also international schools and secondary industrial institutes, that locates in Saudi Arabia, and their families who might teach them.

1.3 Usability Requirements

This application is used by users with different background, so it has to be easy to learn. Also, it must be memorable as it could be an everyday use application or on separate periods of time such as after a long vacation. In addition, it is an application that provides information to

students, then it must be efficient and effective regarding its functionality. Moreover, application that provides services like this must has a good utility to provide the user a better experience.

1.4 User Experience Goals

Satisfying users is the most important user experience goals in the iEN Bag application by design it understandably and flexibly so that it resembles the usual traditional teaching process, such as adding lessons and evaluation by adding questions at the end of lessons, also the presence of textbooks and the ability to interact with and browsing them as well as to be helpful in reducing the effort on the user to be able to move around without having to carry books wherever they goes.

1.5 Interaction and Interface Type

- Interaction Type:

There are three interaction types, the table will show these types and the use of each one.

Interaction Type	Utilization
Instructing	Share or save textbooks, selecting options from the menu, and pressing buttons to display courses and other lists as well to solve questions.
Conversing	Asked questions and answer them through the teachers or by searching the application.
Manipulating	Selecting stop and start the lessons, zooming in and out the textbooks, or any actions such as opening, closing on virtual objects.

- Interface Type:

The type of interface used in the iEN Bag application is Mobile.

1.6 Context of Use

iEN Bag application is used by teachers and students at anytime and anywhere they need to return to lessons, textbooks, and when they need to review lessons or evaluate themselves if they have the app on their smart device.

1.7 Interface Problems

1. In figure1 this is an icon for register new user, but this is not visible as it's having the same color of background and we can register new user by clicking on Log in, then click on new user in figure2.

Figure 1

Figure 2

Figure 3

2. When clicking on new user in figure 2, The screen will appear like figure 3, but there is no information to register new user. Also, there is another problem, search icon is locating above the Facebook account then when trying to click on it to search there is confusion.
3. In Figure 4, the app lacks some features that we would also like to add it such as sounds for instructions that appear on the screen for those who cannot see and voice recording, as well as sign language for those who cannot hear and novice users.

Figure 4

4. When the user wants to go to homepage like in figure 5, an error message is appearing and there is no need for this!

Figure 5

2. Proposed Solution

In this section, we will show our proposed solution.

2.1. Aim

Due to the increasing importance of e-learning under the current circumstances, the applications that are used for the purpose of education must be carefully designed to meet the needs of students and be attractive, clear, and easy to learn. In this project, we will work to improving the application of the iEN Bag in terms of the interface to be attractive, easy to learn, clear and serve user's need. In addition to add some functions to achieve the benefit of the application for all types of user.

2.2. Objectives

- Providing an interactive learning environment to make education more flexible in difficult circumstances, and to use it to support the educational process in natural conditions.
- Meet user expectations and satisfaction in addition to usability goals.
- Make the app interface more attractive, clear, and serve the user's need.
- Make the app effective to use by all types of users such as novice, deaf, blind users.

2.3. Suggested Improvements

- New user registration icon: the icon is at the top of the page for registering a new user while logging in is at the bottom, while the icons that has similar functionality should be next to each other in a visible position.

  Registering new user step bottom: when pressing on new user, it directs you to a new page that does not help you in registering. To solve it we will display the required information to create account.

- Search icon: this icon is difficult to click due to its location on the Facebook icon. It needs to be placed on a better position.
- Unnecessary error window: when pressing on main icon to navigate to the home page, it displays an alert window of error without a sense reason so, it will be removed.

- Deaf and dumb: There is nothing to help them hear the explanations on the platform, so adding an explanation in sign language will help them.
- Novice users guide: These users are not very familiar with the technology, so adding a voice instruction will help them.

2.4 Conceptual Model

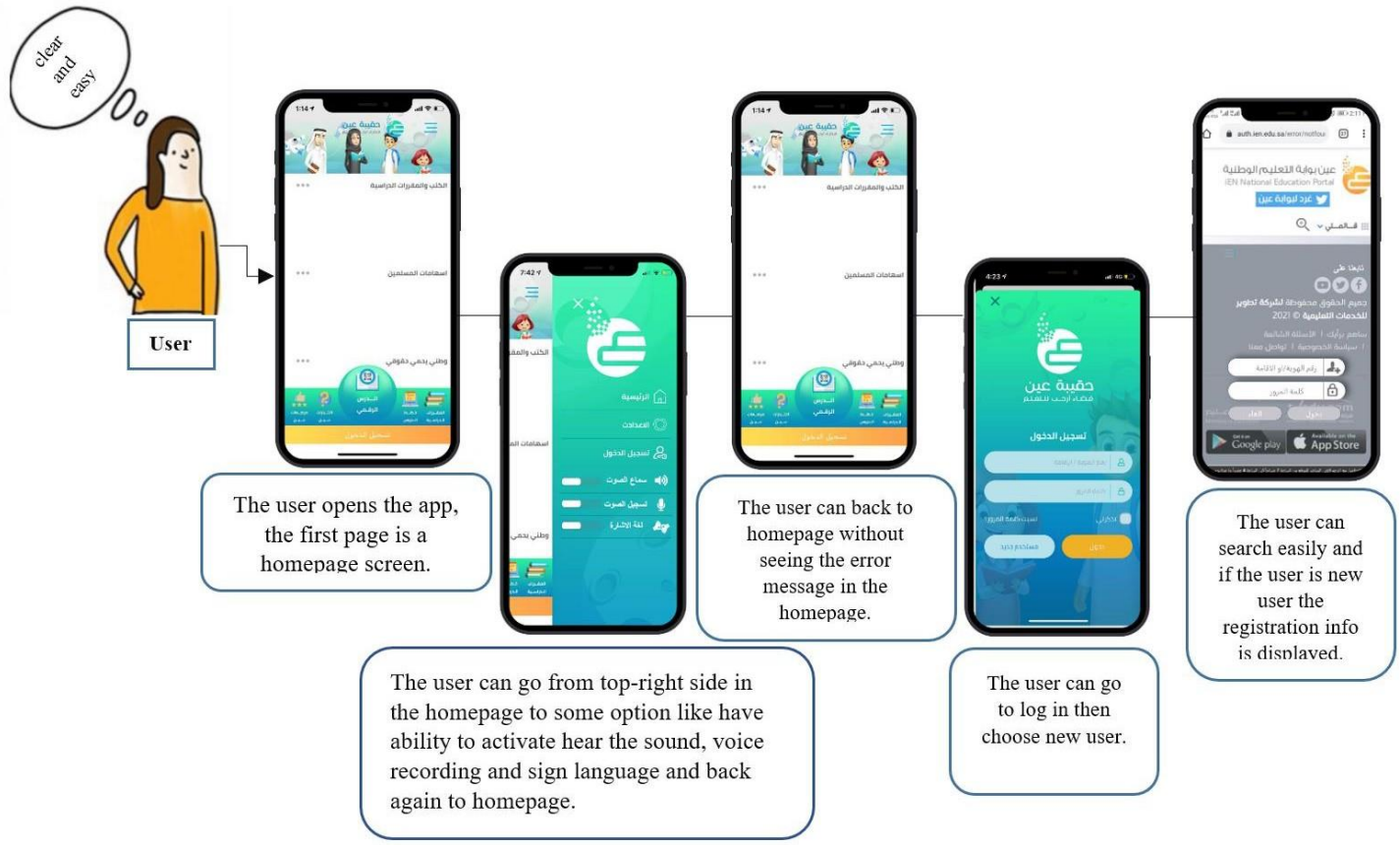

Figure 6

3. Data Gathering

In this section we will design a questionnaire and conduct an online data gathering from the target users' group.

3.1. Questionnaire or interview draft

The table shows the first version of questionnaire.

هل تستخدم تطبيق حقيبة عين؟ / Do you use IEN Application?

- نعم – Yes
- لا - No

بأي لغة تود متابعة الاستبيان؟ / In what language would you like to continue the questionnaire?

- العربية
- English

العمر:	Age:
أقل من ٢١	Less than 12
٣١-٨١	13-18
٩١-٠٤	19-40
١٤-٠٦	41-60
أكبر من ٠٦	Bigger than 60

المستوى التعليمي:	Education Level:
ابتدائي	Primary school
متوسط	Middle school

o High school o University stage o Other	o ثانوي o جامعي o أخرى
How do you rate your abilities in using technology? 5 4 3 2 1 (Professional) 5 ○ ○ ○ ○ ○ (Beginner) 1	كيف تقيم قدراتك في استخدام التقنية؟ 5 4 3 2 1 (خبير 5 ○ ○ ○ ○ ○ مبتدئ) 1
Are you? o student o teacher o one of the parents of the student o other	هل انت؟ o طالب o مدرس o أحد الوالدين للطالب o اخرى
If your choice is one of the parents of the student or other, in which sector do you work? o Military sector o Educational sector o Health sector o Retired o Student o Other….	إذا كان خيارك أحد الوالدين للطالب او آخري، في أي قطاع تعمل؟ o القطاع العسكري o القطاع التعليمي o القطاع الصحي o متقاعد o طالب o غير ذلك....
What is your goal in using the IEN bag app? o Watch digital lessons. o Course review o Do IEN tests o Watch IEN reviews o Review lesson plans	هدفك من استخدام تطبيق حقيبة عين؟ o مشاهدة الدروس الرقمية o استعراض المقررات الدراسية o استعراض خطط الدروس o القيام باختبارات عين o مشاهدة مراجعات عين
At what time do you prefer to use IEN app? ▪ Morning time ▪ Evening period ☽	ما هي الفترة الزمنية التي تفضل استخدام التطبيق فيها؟ ▪ الفترة الصباحية ▪ الفترة المسائية

What type of device is used usually when using the application? ○ Phone ○ iPad/Tablet ○ Laptop/Desktop	ما هو نوع الجهاز المستخدم عادةً عند استخدام التطبيق؟ ○ جوال ○ ايباد / تابلت ○ البتوب / جهاز كمبيوتر مكتبي
Usually where do you use IEN application? ○ At home ○ At work ○ Public places	عادةً تستخدم التطبيق في ... ○ المنزل ○ العمل ○ الأماكن العامة
How easy is the application to use? 5 4 3 2 1 (Easy) 5 (Hard) 1	ما مدى سهولة استخدام التطبيق؟ 5 4 3 2 1 (سهل) 5 (صعب)1
Is the interface of the app clear? ○ Yes ○ No	هل واجهة التطبيق واضحة؟ ○ نعم ○ ال

Is the new user registration process clear? ○ Yes ○ No	هل عملية تسجيل جديد واضحة؟ ○ نعم ○ ال
Did you notice good things in the application? ○ Yes ○ No	هل لاحظت أشياء جيدة في التطبيق؟ ○ نعم ○ ال
If your previous answer was yes, please telling us what is it? _____	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الجيدة في التطبيق. _____
Did you notice bad things in the application? ○ Yes ○ No	هل لاحظت أشياء غير جيدة عند استخدامك للتطبيق؟ ○ نعم ○ ال
If your previous answer was yes, please telling us what is it? _____	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الغير جيده في التطبيق.. _____
Have you noticed that the application serves the deaf and dumb, or novice in using electronic devices? ○ Yes ○ No	هل لاحظت أن التطبيق يخدم فئة الصم والبكم، أو قليلي الخبرة في استخدام الأجهزة الالكترونية؟ ○ نعم ○ ال

Do you agree that improving the application interface will make it easier for you to use the application? ○ Yes ○ No	هل تؤيد أن تحسين واجهة التطبيق سيسهل عليك استخدام التطبيق؟ ○ نعم ○ ال
What would you suggest to improve the interface to make it easier for you to use? _____	ما الذي تقترحه لتحسين واجهة التطبيق ليسهل عليك استخدامه؟ _____

3.2. Piloting of the draft questionnaire

First improvement

Are you? ○ student ○ teacher ○ one of the parents of the student ○ other	هل انت؟ ○ طالب ○ مدرس ○ أحد الوالدين للطالب ○ اخرى
If your choice is one of the parents of the student or other, in which sector do you work? ○ Military sector ○ Educational sector ○ Health sector ○ Retired ○ Student ○ Other…. _____	إذا كان خيارك أحد الوالدين للطالب او آخري، في أي قطاع تعمل؟ ○ القطاع العسكري ○ القطاع التعليمي ○ القطاع الصحي ○ متقاعد ○ طالب ○ غير ذلك.... _____

Change these two questions into one lead to the same meaning.

in which sector do you work? ○ Military sector ○ Educational sector ○ Health sector ○ Retired ○ Student ○ Other…. _____	في اي قطاع تعمل؟ ○ القطاع العسكري ○ القطاع التعليمي ○ القطاع الصحي ○ متقاعد ○ طالب ○ غير ذلك.... _____

Second improvement

What is your goal in using the IEN bag app? ○ Watch digital lessons. ○ Course review ○ Do IEN tests ○ Watch IEN reviews ○ Review lesson plans	ما هو هدفك من استخدام تطبيق حقيبة عين؟ ○ مشاهدة الدروس الرقمية ○ استعراض المقررات الدراسية ○ استعراض خطط الدروس ○ الق ام باختبارات عين ○ مشاهدة مراجعات عين

Change this question so that instead of choosing one option, now the user can choose more than one choice.

What is your goal in using the IEN bag app? ▪ Watch digital lessons. ▪ Course review ▪ Do IEN tests ▪ Watch IEN reviews ▪ Review lesson plans	ما هو هدفك من استخدام تطبيق حقيبة عين؟ ▪ مشاهدة الدروس الرقمية ▪ استعراض المقررات الدراسية ▪ استعراض خطط الدروس ▪ الق ام باختبارات عين ▪ مشاهدة مراجعات عين

3.3. Preparation of a final questionnaire/ interview after the pilot test (version II)

The table shows the final questionnaire. The square option means allow select multiple choices and the circle allows select only one choice.

هل تستخدم تطبيق حزمة عين؟ / Do you use IEN Application? ○ نعم – Yes ○ لا – No	
بأي لغة تود متابعة الاستبيان؟ / In what language would you like to continue the questionnaire? ○ العربية ○ English	
Age: ○ Less than 12 ○ 13-18 ○ 19-40 ○ 41-60 ○ Bigger than 60	العمر: ○ أقل من ٢١ ○ ٣١-٨١ ○ ٩١-٠٤ ○ ١٤-٠٦ أكبر من ٠٦
Education Level: ○ Primary school ○ Middle school ○ High school ○ University stage ○ Other	المستوى التعليمي: ○ ابتدائي ○ متوسط ○ ثانوي ○ جامعي ○ أخرى
How do you rate your abilities in using technology? 5 4 3 2 1 (Professional) 5 ○ ○ ○ ○ ○ (Beginner) 1	كيف تقيم قدراتك في استخدام التقنية؟ 5 4 3 2 1 1)مبتدئ(○ ○ ○ ○ ○ 5)خبير(
in which sector do you work? ○ Military sector ○ Educational sector ○ Health sector ○ Retired ○ Student ○ Other…. _____	في اي قطاع تعمل؟ ○ القطاع العسكري ○ القطاع التعليمي ○ القطاع الصحي ○ متقاعد ○ طالب ○ غير ذلك.... _____

What is your goal in using the IEN bag app? ▪ Watch digital lessons. ▪ Course review ▪ Do IEN tests ▪ Watch IEN reviews ▪ Review lesson plans	ما هو هدفك من استخدام تطبيق حقيبة عين؟ ▪ مشاهدة الدروس الرقمية ▪ استعراض المقررات الدراسية ▪ استعراض خطط الدروس ▪ القيام باختبارات عين ▪ مشاهدة مراجعات عين
At what time do you prefer to use IEN app? ▪ Morning time ▪ Evening period ☽	ما هي الفترة الزمنية التي تفضل استخدام التطبيق فيها؟ ▪ الفترة الصباحية ▪ الفترة المسائية
What type of device is used usually when using the application? o Phone o iPad/Tablet o Laptop/Desktop	ما هو نوع الجهاز المستخدم عادةً عند استخدام التطبيق؟ o جوال o ايباد / تابلت o البتوب / جهاز كمبيوتر مكتبي
Usually where do you use IEN application? o At home o At work o Public places	عادةً تستخدم التطبيق في ... o المنزل o العمل o الأماكن العامة
How easy is the application to use? 5 4 3 2 1 (Easy) 5 ○ ○ ○ ○ ○ (Hard) 1	ما مدى سهولة استخدام التطبيق؟ 5 4 3 2 1 1)صعب(○ ○ ○ ○ ○ 5)سهل(

Is the interface of the app clear? ○ Yes ○ No	هل واجهة التطبيق واضحة؟ ○ نعم ○ ال
Is the new user registration process clear? ○ Yes ○ No	هل عملية تسجيل جديد واضحة؟ ○ نعم ○ ال

Did you notice good things in the application? o Yes o No	هل الحظت أشياء جيدة في التطبيق؟ o نعم o ال
If your previous answer was yes, please telling us what is it? _____	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الجيدة في التطبيق. _____
Did you notice bad things in the application? o Yes o No	هل الحظت أشياء غير جيدة عند استخدامك للتطبيق؟ o نعم o ال
If your previous answer was yes, please telling us what is it? _____	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الغير جيده في التطبيق.. _____
Have you noticed that the application serves the deaf and dumb, or novice in using electronic devices? o Yes o No	هل الحظت أن التطبيق يخدم فئة الصم والبكم، أو قليلي الخبرة في استخدام االجهزة االلكترونية؟ o نعم o ال
Do you agree that improving the application interface will make it easier for you to use the application? o Yes o No	هل تؤيد أن تحسين واجهة التطبيق سيسهل عليك استخدام التطبيق؟ o نعم o ال
What would you suggest to improve the interface to make it easier for you to use? _____	ما الذي تقترحه لتحسين واجهة التطبيق ليسهل عليك استخدامه؟ _____

3.4. Collected data

The following table presents the results of the questionnaire of **20** people of different ages and areas. In the table, we will show the number of chosen answers per question either in Arabic or English.

هل تستخدم تطبيق حزمة عين؟ / Do you use IEN Application?

نعم– Yes	20 Person
لا - No	0 Person

بأي لغة تود متابعة الاستبيان؟ / In what language would you like to continue the questionnaire?

العربية	11 Person
English	9 Person

Age:		العمر:	
Less than 12	2 Person	أقل من ٢١	0 Person
13-18	2 Person	٣١-٨١	6 Person
19-40	2 Person	٩١-١٤	0 Person
41-60	2 Person	٠٤-٠٦	3 Person
Bigger than 60	1 Person	أكبر من ٠٦	2 Person

Education Level:		المستوى التعليمي:	
Primary school	2 Person	ابتدائي	1 Person
Middle school	0 Person	متوسط	3 Person
High school	3 Person	ثانوي	3 Person
University stage	3 Person	جامعي	3 Person
Other	1 Person	أخرى	1 Person

How do you rate your abilities in using technology?

	5	4	3	2	1	
(Professional) 5	2	3	3	1	0	(Beginner) 1

كيف تقيم قدراتك في استخدام التقنية؟

	5	4	3	2	1	
(خبير) 5	1	3	6	1	0	(مبتدئ)1

In which sector do you work?		في اي قطاع تعمل؟	
Military sector	0 Person		0 Person
Educational s ctor	3 Person	القطاع العسكري، القطاع التعليمي	3 Person
Health sector	1 Person	القطاع الصحي	0 Person
Retired	1 Person	متقاعد	1 Person
Student	4 Person	طالب	6 Person
Other….		غير ذلك..	تجارة

What is your goal in using the IEN bag app?	ما هو هدفك من استخدام تطبيق حقيبة عين؟
Watch digital lessons — 7 Person	مشاهدة الدروس الرقمية — 8 Person
Course review — 5 Person	استعراض المقررات الدراسية — 7 Person
Do IEN tests — 9 Person	استعراض خطط الدروس — 5 Person
Watch IEN reviews — 7 Person	القيام باختبارات عين — 5 Person
Review lesson plans — 5 Person	مشاهدة مراجعات عين — 4 Person
At what time do you prefer to use IEN app?	ما هي الفترة الزمنية التي تفضل استخدام التطبيق فيها؟
Morning time — 0 Person	الفترة الصباحية — 7 Person
Evening period — 9 Person	الفترة المسائية — 9 Person
What type of device is used usually when using the application?	ما هو نوع الجهاز المستخدم عادةً عند استخدام التطبيق؟
Phone — 4 Person	جوال — 5 Person
iPad/Tablet — 2 Person	ايباد / تابلت — 3 Person
Laptop/Desktop — 3 Person	البتوب / جهاز كمبيوتر مكتبي — 3 Person
Usually where do you use IEN application?	عادةً تستخدم التطبيق في ...
At home — 9 Person	المنزل — 10 Person
At work — 0 Person	العمل — 1 Person
Public places — 0 Person	الأماكن العامة — 0 Person
How easy is the application to use?	ما مدى سهولة استخدام التطبيق؟
(Easy) 5 — 5: 0, 4: 2, 3: 5, 2: 2, 1: 0 — (Hard) 1	(سهل) 5 — 5: 0, 4: 2, 3: 8, 2: 1, 1: 0 — (صعب) 1

Is the interface of the app clear?	هل واجهة التطبيق واضحة؟
Yes **5 Person**	نعم **9 Person**
No **4 Person**	ال **2 Person**
Is the new user registration process clear?	هل عملية تسجيل جديد واضحة؟
Yes **2 Person**	نعم **1 Person**
No **7 Person**	ال **10 Person**
Did you notice good things in the application?	هل الحظت أشياء جيدة في التطبيق؟
Yes **8 Person**	نعم **11 Person**
No **1 Person**	ال **0 Person**

If your previous answer was yes, please telling us what is it? 1. الدروس مرره مفيدة 2. الدروس حلوه 3. الدروس حلوه4. الدروس والشرح جميل جدا 5. االختبارات حلوه 6. المراجعات حلوه مفيده 7. مخطط المقرر يفيدني مره بقيمي دروسي 8. طريقه عرض الكتاب وشرحه حلو	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الجيدة في التطبيق. 1. االختبارات اللي موجودة حلوه مرره ومفيدة 2. االختبارات 3. التطبيق جميل والمراجعات واالختبارات اللي فيه حلوه 4. البرنامج حلو 5. االختبارات فيه حلوه وفيها نشابهه من اللي درجي 6. حلو ان الكتب فيه وشرح واختبارت وطرق كتيره 7. الدروس واالختبارات والمراجعات مرره مفيدة 8. خطط الدروس مرره تفيدني بشغلي 9. الشرح والفيوهات 10. الدروس واالختبارات 11. ممتع التطبيق في اشياء حلوه عشان اثبت فهمي
Did you notice bad things in the application? Yes **9 Person** No **0 Person**	هل الحظت أشياء غير جيدة عزد استخدامك للتطبيق؟ نعم **11 Person** ال **0 Person**
If your previous answer was yes, please telling us what is it? 1. تسجيل جديد فيه مرره صعب واتصلت اتصال على الدعم عشان اعرف كيف الن هانة تسجيل جديد تزول لصفحة هو مفيده 2. دائما االختبارات يجي خطأ وطلع ان في خيارات تحت وانا مااعرف في رسالة خطأ كل شوية وفي عالمة سرش فوق الفيسبوك والتويتر مااقدر اتحط حسابهم 4. االختبارات دائما يجي حلي خطأ والكتشفت ان قي خيارات تحت هو بايه 5. االختبارات فيه كلشي خيارات هو واضحه ازو لها تكمله6. في خيارات تحت هو بايه الزم تحط لو تحط بشاشه وحده افضل7. تسجيل جديد صعب فيه هو واضح 8. تسجيل جديد صعب 9. تسجيل جديد هو واضح كيف	إذا كانت اجابتك السابقة نعم، من فضلك اذكر الجوانب الغير جيده في التطبيق.. 1. رسالة خطأ تطلع بالشاشة الرئيسيه دائما كل مااتفتح التطبيق 2. في تحت لما اجي بفتح حسابهم بفيسبوك تجي السرش عليها ومااقدر 3. التسجيل الجديد فيه مرره صعب وهو واضح 4. رسالة خطأ تجي كل مااتفتح التطبيق 5. االختبارات في خيارات تحت هو واضح انها موجوده 6. في اشارة السرش مكانها خطأ 7. في رسالة خطأ تطلع لما اتفتح الشاشه الرئيسية 8. عملية التسجيل الول مره هو واضح 9. تجي رسالة خطأ دائما 10. في اشارة السرش تجي فوق االشياء وكمان في خيارات بالختبار زاقصه 11. رسالة خطأ تجي دائما

Have you noticed that the application serves the deaf and dumb, or novice in using electronic devices? Yes 0 Person No 9 Person	هل الحظت أن التطبيق يخدم فئة الصم والبكم، أو قليلي الخبرة في استخدام االجهزة االلكترونية؟ نعم 0 Person ال 11 Person
Do you agree that improving the application interface will make it easier for you to use the application? Yes 9 Person No 0 Person	هل تؤيد أن تحسين واجهة التطبيق سيسهل عليك استخدام التطبيق؟ نعم 11 Person ال 0 Person
What would you suggest to improve the interface to make it easier for you to use? 1. يكون في مكان مخصص لتسجيل جديد 2. يكون في شي يوضح ان في خيارات تحت 3. شيلو السرش لمكان ثاني 4. يكون في شي يوضح باقي خيارات الكويز 5. شي يوضح عدد الخيارات او ازو يسحب لتحت6. خيارات االختبار تنحط بشاشه جديد وحده 7. تتعدل تسجيل 8. تنحل مشكله تسجيل جديد 9. خطوات واضحه لتسجيل جديد	ما الذي تقترحه لتحسين واجهة التطبيق ليسهل عليك استخدامه؟ 1. مكن رسالة الخطأ دي اللي تظهر 2. تشال افضل تشال حركة البحث وتنحط بمكان ثاني3. اضافه واجهه جديد لتسجيل جديد يسهل الموضوع4. شيلو رسالة الخطأ 5. يكون في مؤشر ويوضح في اشياء تحت 6. شيلو السرش لمكان ثاني 7. تشال رسالة الخطأ 8. يكون في مكان اوضح ووشاشه اوضح لتسجيل جديد 9. الزم حل لرسالة الخطأ مابتظهر 10. تسال السرش او تنحط بمكان ثابت 11. حل لمشكله الخطأ اللي يطلع

3.5. Data Analysis

After collecting the data, in this section, we will analyse the results using charts and identifying recurring patterns in open questions.

At the beginning of our questionnaire, we ask if they are using the app noticing figure 7 that the answers are yes which mean that the application is important and used, also that the questionnaire was directed to the appropriate category that serves what we are working on. We also asked about the appropriate language in figure 8 to complete the rest of the questionnaire for the user. We found 11 out of 20 prefer the Arabic language and the rest 9 of 20 prefer English.

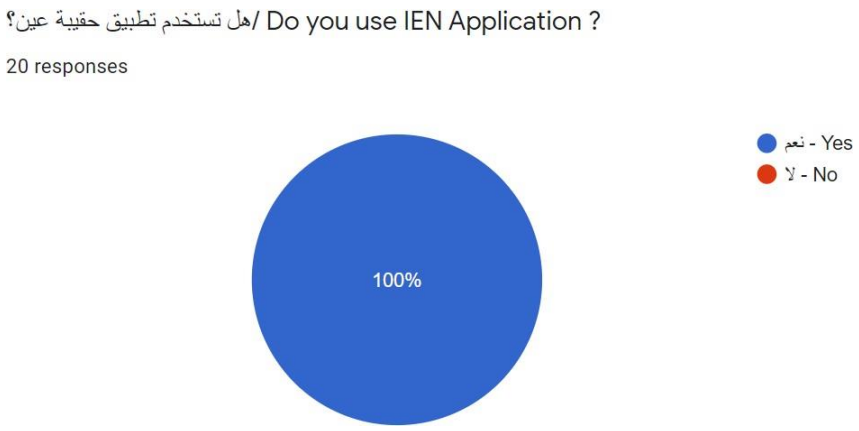

Figure7

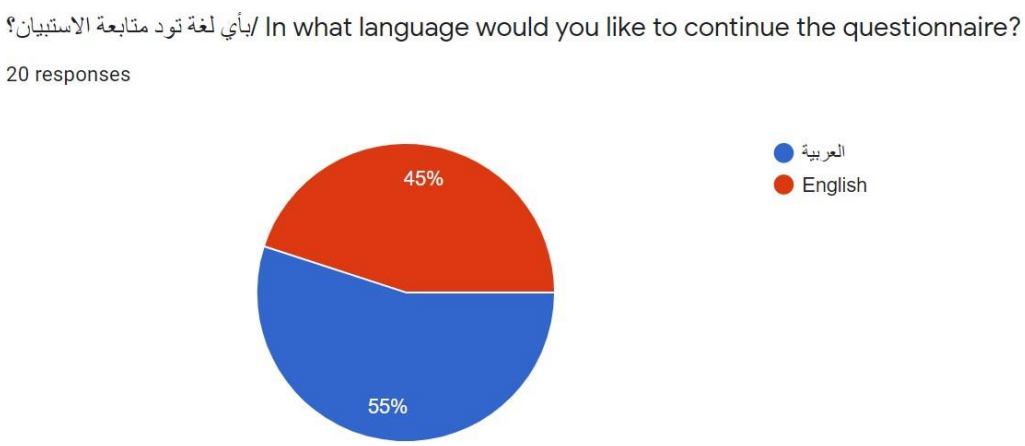

Figure 8

Then we asked some questions to find out the user's characteristics, we asked about their ages as shows in figure 9-a,9-b. we saw differences in ages of users, there are 2 out of 20 less than 12, and 8out of 20 and they represent almost half of responses are from 13-18, 2 out of 20 are from 19-41,5 out of 20 are between 41-60 and 3 out of 20 are bigger than 60. This indicates that the design of the application must consider the different ages.

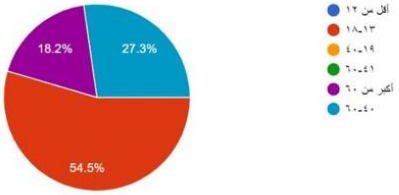

Figure 9-a

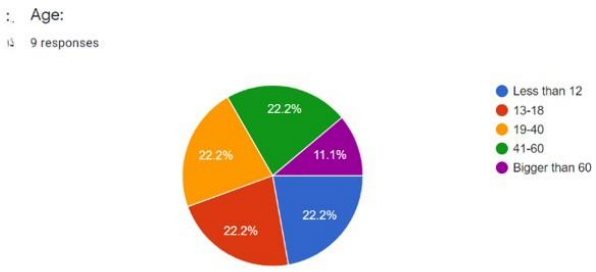

Figure 9-b

We also found that it is used in various education levels. Figures 10-a and 10-b shown that 12 out of20 are the students that the app serves (Primary, Middle and High school) and 6 out of 20 in university stage ,and the rest (2 out 20) are from the other levels.

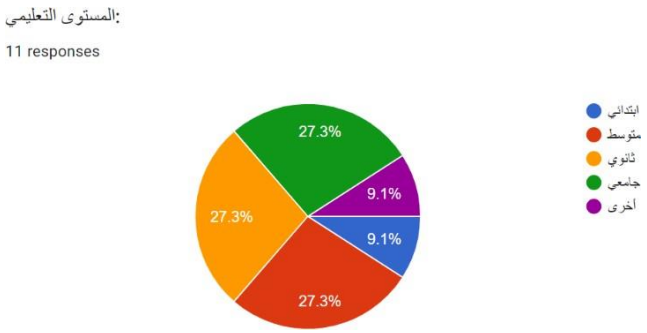

Figure 10-a

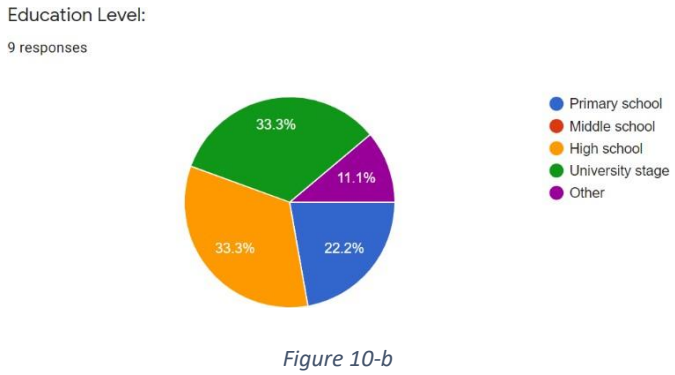

Figure 10-b

As well we inquired about the extent of their abilities to use the technology. The result was satisfactory, as more than half of them as shown in Figures 11-a,11-b are closer to professional.

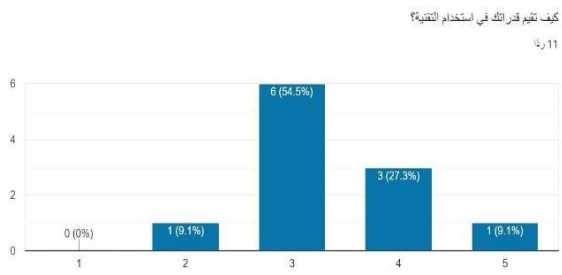

Figure 11-a

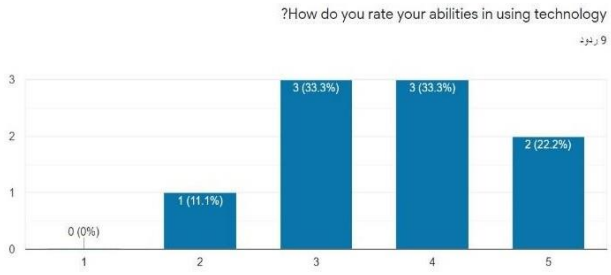

Figure 11-b

Also, as shown in figures 12-a, 12-b we found that most of the application users are from the educational sector or students by asking them about their work sectors and we found a few of them work in other sectors or are retired.

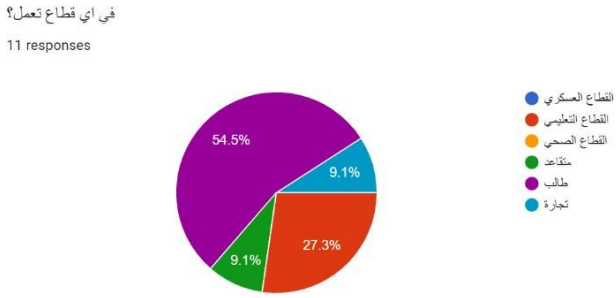

Figure 12-a

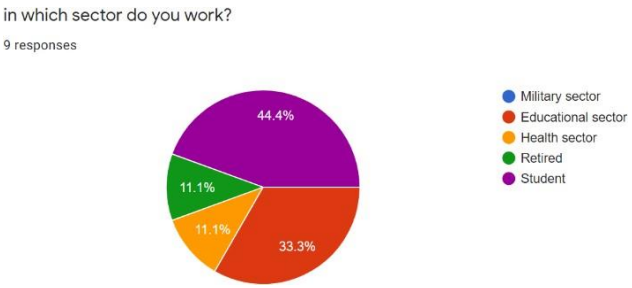

Figure 12-b

Then we moved on to investigate their use of the application, in figures 13-a ,b we asked about their goal of using the application we put in the answers to the most important services provided in the application and allowed multiple select options. We noticed that all services are of interest to the user, which indicates the importance of keenness to display them in the best way as 15 out of 20 chose to Watch digital lessons, 12 out of 20 chose Course review, 14 out of 20 chose Do IEN tests, 11 out of 20 chose Watch IEN reviews and half of them chose Review lesson plans.

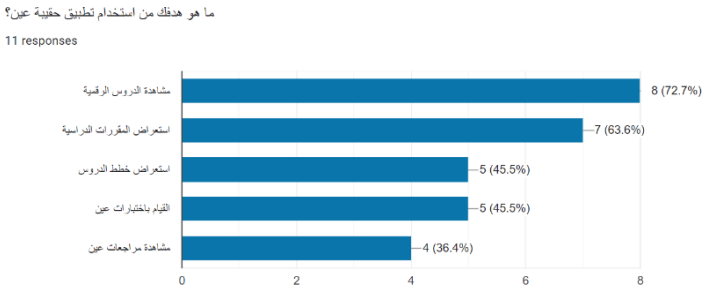

Figure 13-a

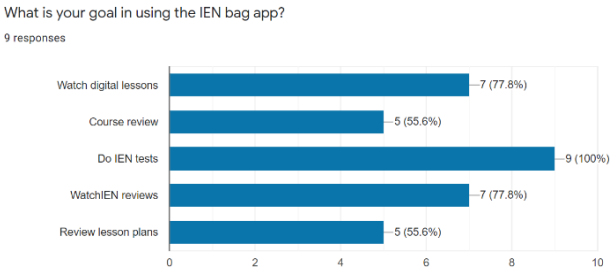

Figure 13-b

After that we survey about the status of their use of the application, we concluded through the Figures 14-a to 16-b that most of them use it in the evening period and they represent 18 out of 20, and 7 of them also prefer it in the morning, which allows designers to add more features such as Dark Mode. We also found that nearly half choose the iPhone when we asked them about the type of device used when using the application and the other half is separated between iPad/Tablet and Laptop/Desktop. Also, we see that the number of the answers about where to use the app was at home, at a large rate, which is 19 out of 20.

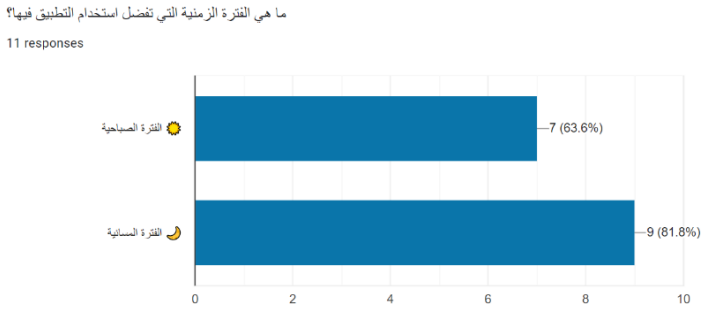

Figure 14-a

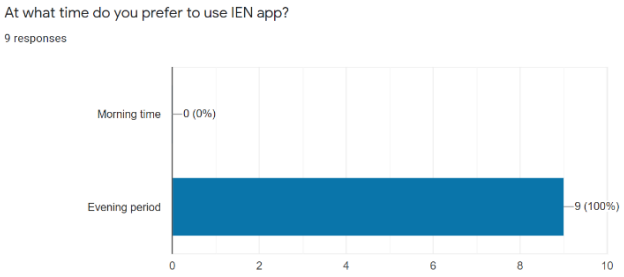

Figure 14-b

Figure 15-a

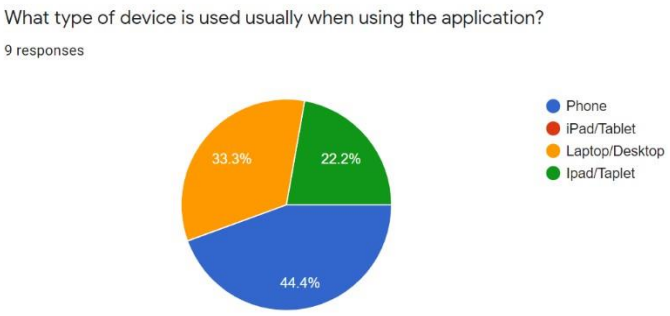

Figure 15-b

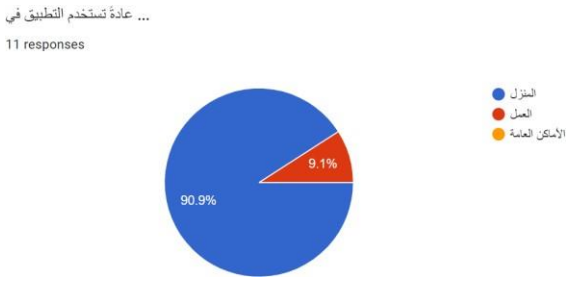

Figure 16-a

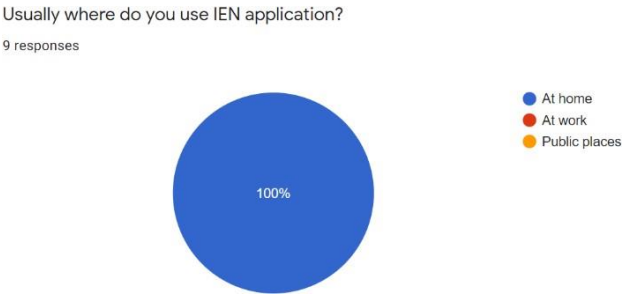

Figure 16-b

After that, we surveyed how easy the application is for users, which is a question through which we conclude how effective it is for users. We asked users to rate from one (hard) to five (easy) and the result is as shown in the Figures 17-a,17-b, we found that more than half of the users rated three, which indicates that there are difficulties that the user faces.

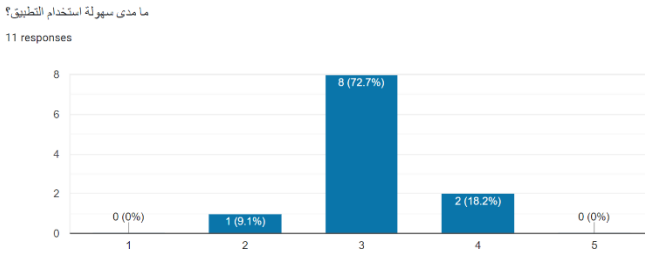

Figure 17-a

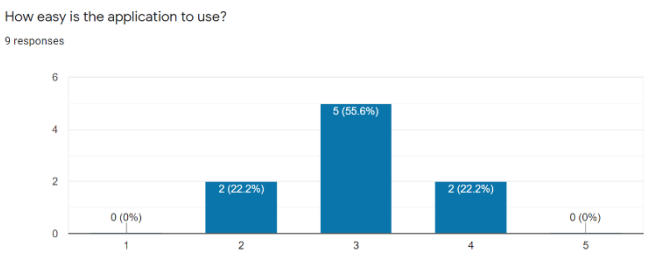

Figure 17-b

We dealt more deeply with the details of the user interface. First, we asked the user in general about the clarity of the application interface. We found that many of them answered yes, and they represented 14 out of 20, while 6 out of 20 saws that the interface is not clear. As for the other question, the answers were the focus of our attention, where we asked the user about the clarity of the new user registration process, and here the problem appeared, which is that 17 out of 20 they answer is not clear which helped us identify the first problem faced by the user. Figures from 18-a to 19-b show the result discussed.

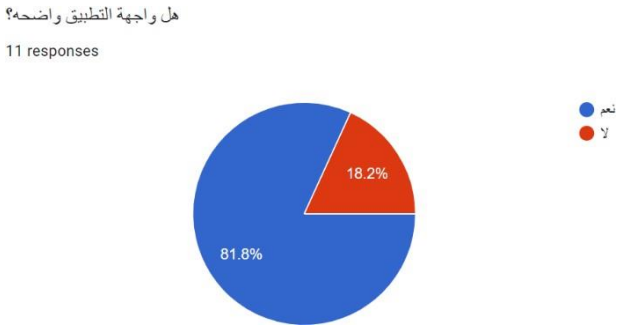

Figure 18-a

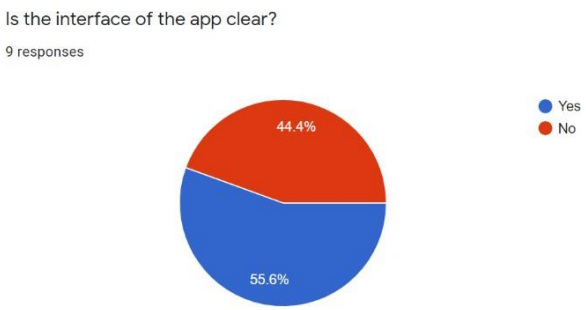

Figure 18-b

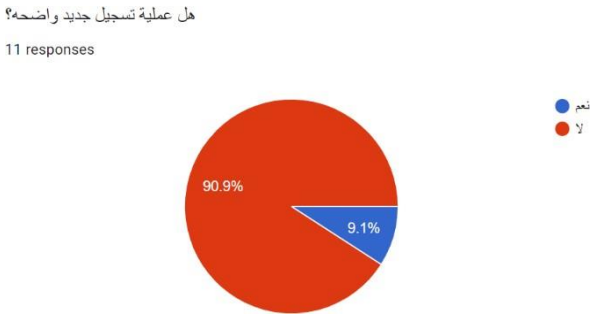

Figure 19-a

Figure 19-b

Then we asked some questions to list features, requirements, and improvements for each of our users.

First as shown in figures 20-a and 20-b, we asked if there were good things in the application and most of them answered yes, then we asked them to mention the good things, and the answers were revolved around five services that will be mentioned using identifying recurring patternsanalysis.

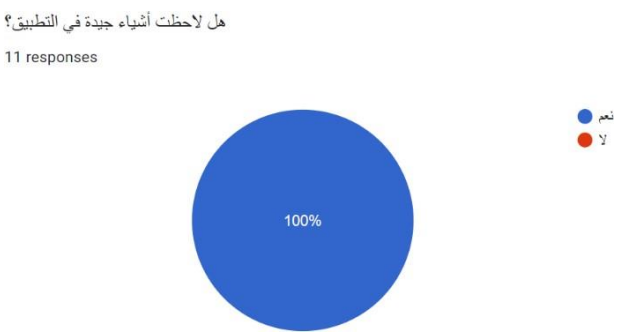

Figure 20-a

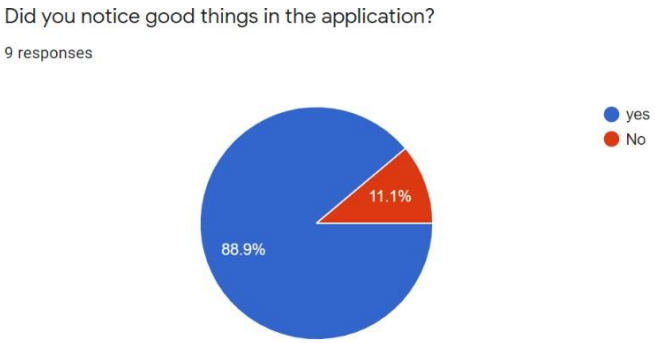

Figure 20-b

The table shows the analysis of answers in open question about the good things. The result are the Exams, Lessons, Explanation, Reviews and Outline are the good things depends on the users answer.

Review/مراجعات	Exams/اختبارات	Lessons/دروس	Explanation/شروح	Outline/مخطط
التطبيق جميل و**المراجعات** والاختبارات اللي فيه حلوه	**الاختبارات** اللي موجوده حلوه مرره ومفيدة	**الدروس** والاختبارات	حلو ان الكتب فيه و**شرح** واختبارت وطرق كتيره	**خطط** الدروس مرره تفيدني بشغلي
الدروس والاختبارات و**المراجعات** مرره مفيدة	**الاختبارات**	**الدروس** والاختبارات والمراجعات مرره مفيدة	**الشرح** والفيوهات	**مخطط** المقرر يفيدني مره بتقسيم دروسي
المراجعات حلوه مفيدة	**الاختبارات** فيه حلوه وفيها تشابهه من اللي تجي	**الدروس** مرره مفيدة	الدروس و**الشرح** جميل جدا	
	حلو ان الكتب فيه وشرح و**اختبارت** وطرق كتيره	**الدروس** حلوه	طريقه عرض الكتاب و**شرحه** حلوه	
	الاختبارات حلوه			

Second, we asked if there were bad things, and as shown in the Figures 21-a and 21-b, the results showed that all of them answered yes, which indicates that the application needs to fix many problems, then we asked them to write the bad things and by using identifying recurring patternsanalysis we found that the answers were revolved around four problems as shown in following the table.

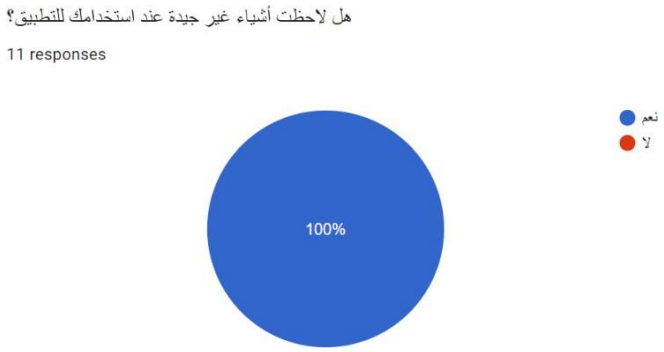

Figure 21-a

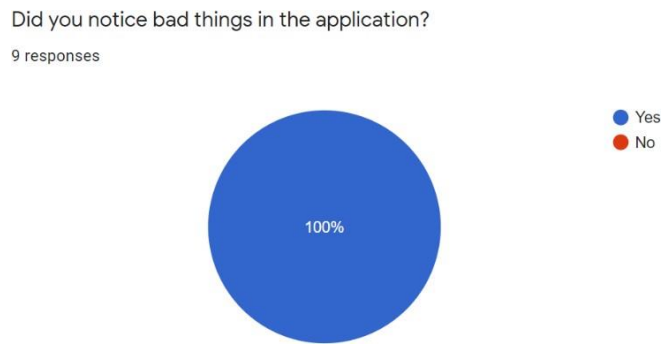

Figure 21-b

The table shows the analysis of answers in open question about the bad things. The results are depending on the user's answer. The problem is the error message always appear in the application, New registration problem, the problem of the choice’s exam and the research icon.

Error message/ رسالة خطأ	New registration/تسجيل جديد	Exam/اختبار	Research/بحث
رسالة خطأ تطلع بالشاشة الرئيسيه دائما كل ماانتح التطبيق	**التسجيل الجديد** نيه مرره صعب ومو واضح	**االختبارات** في خيارات تحت مو واضح انها موجوده	في تحت لما اجي بنتح حسابهم بنيسبوك تحي **السيرش** عليها وماقدر
رسالة خطأ تجي كل ماانتح التطبيق	عملية **التسجيل** الول مره مو واضحة	وكمان في خيارات ب**االختبار** ناقصه	في اشارة **السرش** مكانها خطأ
في **رسالة خطأ** تطلع لما انتح الشاشه الرئيسية	**تسجيل جديد** نيه مرره صعب وانصلت انصال على الدعم عشان اعرف كيف الن هانة **تسجيل جديد** تنزل لصفحة مو مفيده	لما ال**اختبارات** يجي خطأ وطلع ان في خيارات تحت وانا ما اعرف	في اشارة **السرش** تجي فوق االشياء
تجي **رسالة خطأ** دائما	**تسجيل جديد** صعب نيه مو واضح	**االختبارات** دائما يجي حلي خطأ واكتشفت ان قي خيارات تحت مو بايزه	وفي عالمة **سيرش** فوق النيسبوك والتويتر ماقدر انتح حسابهم
رسالة خطأ تجي دائما	**تسجيل جديد** صعب	**االختبارات** نيه مشكله خيارات مو واضحه انو لها تكمله	
نجي **رسالة خطأ** كل شوية	**تسجيل جديد** مو واضح كيف		

Third, as in the figures 22-a and 22-b, we surveyed them observe if they noticed that the applicationserves people who suffer from hearing or speech difficulties or have little experience in using electronic devices and the result is united as all responses see that the application does not consider people who suffer from difficulties.

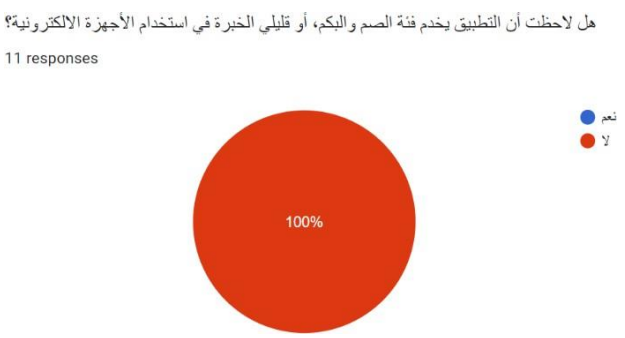

Figure 22-a

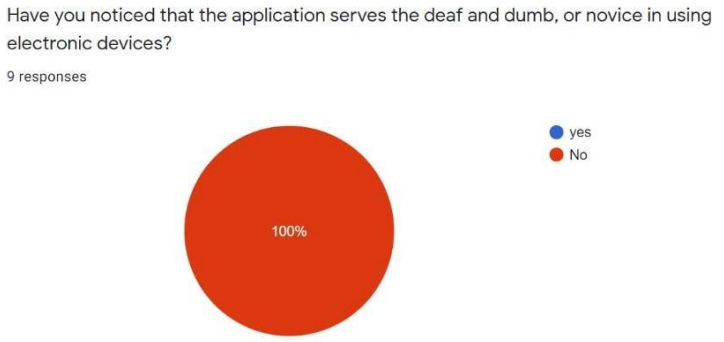

Figure 22-b

Finally, we asked if they agree that improving the interfaces will make the application easier. The results showed in the figures 23-a and 23-b that all of them support the improvements. Then we asked them to suggest improvements. The results by using identifying recurring patterns analysisshow four improvements that the user needs.

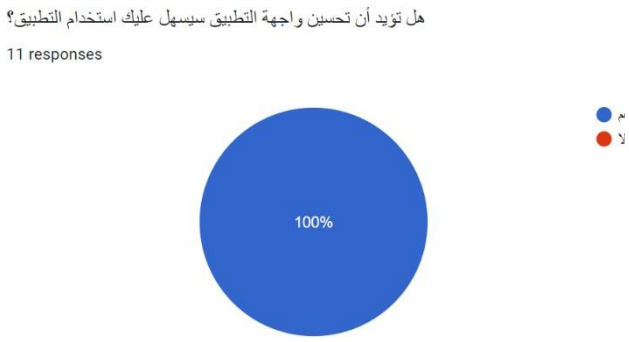

Figure 23-a

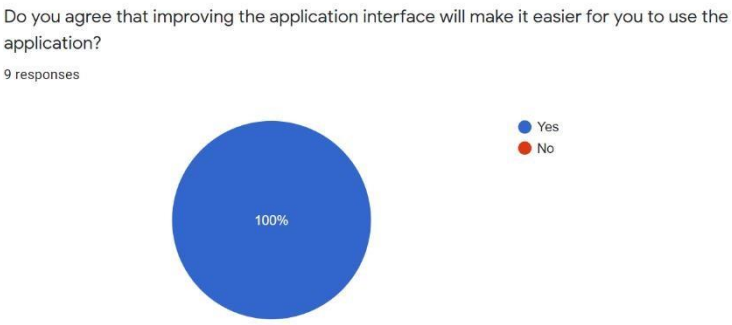

Figure 23-b

This table shows the analysis of the results for the improvement open question. The results showed that the suggested improvements revolve around deleting the error message as it is useless, the search icon must be moved in a suitable place, clarifying options in tests in some way, and adding an interface for new registration in a place designated for it.

Error message/ رسالة خطأ	New registration/تسجيل جديد	Exam choices/خيارات االختبار	Research/بحث
ممكن **رسالة الخطأ** دي اللي تظهر تشال	يكون في مكان مخصص لـ**تسجيل جديد**	يكون في شي يوضح ان في **خيارات** تحت	شيلو **السرش** لمكان تاني
شيلو **رسالة الخطأ**	تعدل **تسجيل جديد**	يكون في شي يوضح باقي **خيارات** الكويز	افضل تشال حركة **البحث** وتحط بمكان تاني
تشال **رسالة الخطأ**	تحل مشاكله **تسجيل جديد**	شي يوضح عدد **الخيارات** او ازو يبسحب تحت	شيلو **السرش** لمكان تاني
الزم حل **لرسالة الخطأ** مايظهر	خطوات واضحه **لتسجيل جديد**	**خيارات االختبار** تحط بشاشه وحده	تسال **السرش** او تحط بمكان ثابت
حل **لمشكله الخطأ** اللي يطلع	اضافه واجهه جديد **لتسجيل جديد** يسهل الموضوع		
	يكون في مكان اوضح وشاشه اوضح **لتسجيل جديد**		

3.6. Results summary

IEN is one of the most important applications offered to the student due to the importance of e-learning under the current circumstances. It is used by different ages and backgrounds, so it should focus on how to design it to suit everyone. The questionnaire was sufficient to show the most important information required for the next step, as we found out who its users are, what their needs and what they want, and we will work on the improvements that we reached through the answers in the questionnaire such as research process, exam choices, new registration, error massage and add function support people who suffer from hearing or speech difficulties or have little experience in using electronic devices. This problem will be considered to show the program better and without problems so that the users can enjoy a wonderful technical educational experience.

4. References

- Preece, J., Sharp, H., & Rogers, Y. (2015). Interaction Design: Beyond Human-Computer Interaction (4th ed.). Wiley
- *iEN Bag Application*. (2020, February 13). GooglePlay. https://play.google.com/store/apps/details?id=com.newline.IEN&hl=ar&gl=US
- عين بيئية. (2017, September 23). Youtube. https://youtu.be/GURg9dpMkZ0