

**MOBILE APPLICATION: TUTORIAL ON HARDWARE AND
PROGRAMMING LANGUAGES FOR INFORMATION TECHNOLOGY
STUDENTS OF LEYTE NORMAL UNIVERSITY**

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INTRODUCTION

In the advent of technology, it has been observed that students nowadays are into gadgets, personal computers and laptops. The students use to study using their personal computers, laptops but they usually use their smartphone because of the portability. The students nowadays prefer electronic books rather than going to libraries.

In the study of Moll (2013), mobile learning is considered to be the ability to use mobile devices to support teaching and learning. It is the 'mobile' aspect of mobile learning that makes it stand apart from other types of learning, specifically designing learning experiences that exploit the opportunities that 'mobility' can offer us. This is because mobile devices have features and functionality for supporting learners. Example is, pod-casts of lectures can be made available for downloading. Learners are expected to engage with these learning resources while away from the traditional learning spaces. Although some will say that physical books count as mobile devices too, in this advice document we are concerned with electronic mobile devices.

There is a wide range of mobile devices on the market including laptops, PDAs, and eBook readers. However, the most popular is the mobile device - the mobile phone. Mass proliferation of mobile phones and the features and functionality they offer makes the device stand out as an area ripe for exploration. Mobile phones are multi-function devices and more interesting due to their very nature of offering 'mobility', but also for their ability to create and consume digital media. Furthermore, its convergence with the Internet offers further potential opportunities to support teaching and learning.

What makes mobile learning exciting is that despite of many of individual features being around for years, it is the bringing together of the features, functionality and ability to connect to the Internet that means we have now passed the tipping point regarding learner adoption: thus creating and using digital media can be seriously looked at with these devices.

This research describes a mobile learning tutorial project, where mobile devices are used for educational activities, users/learners and educators/instructors could discuss and share their ideas about computer courses that offer this application through the mobile device. The main focus of this research is to promote learning on topics that will focus on computer and how it works; the hardware specifically networking, and PC troubleshooting, and the software specifically on computer programming like C++, Java, JavaScript, PHP, Python, and SQL, also is to create flexible and easy learning solutions which will enable access to information using different devices, and support learning in a variety of situations.

The researcher decided to develop a Tutorial for Programming Languages, PC Troubleshooting and Networking Computer Courses using Android Application to design and develop a mobile based software using android platform that is easier and contains more lessons, video tutorials and each lesson will have an activities or exercises to be executed and provides knowledge per lessons even without internet connection.

OBJECTIVES

This study aimed to develop a mobile application that will run on a Smartphone with android platform in order to support the learning experience of the Students in software and hardware programming at Leyte Normal University.

Specific objectives:

Specifically, this study seeks the following:

1. Mobile-based basic tutorial on hardware specifically networking, PC troubleshooting and software languages specifically on computer programming languages like C++, Java, JavaScript, PHP, Python, and SQL;
2. Learning activities and exercises in each topic/chapter and stores users scores which is pass or failed;
3. Internet offline setting access to tutorials and alternative online access to the tutorial;
4. User friendly mobile based application; and
5. A mobile based application accessible anytime, and anywhere.

METHODOLOGY

In figure 1, the input indicates the information needed in the study. The process is the use of the mobile-based tutorial on hardware and programming languages to achieve an effective tutorial for hardware and programming languages lessons using android application.

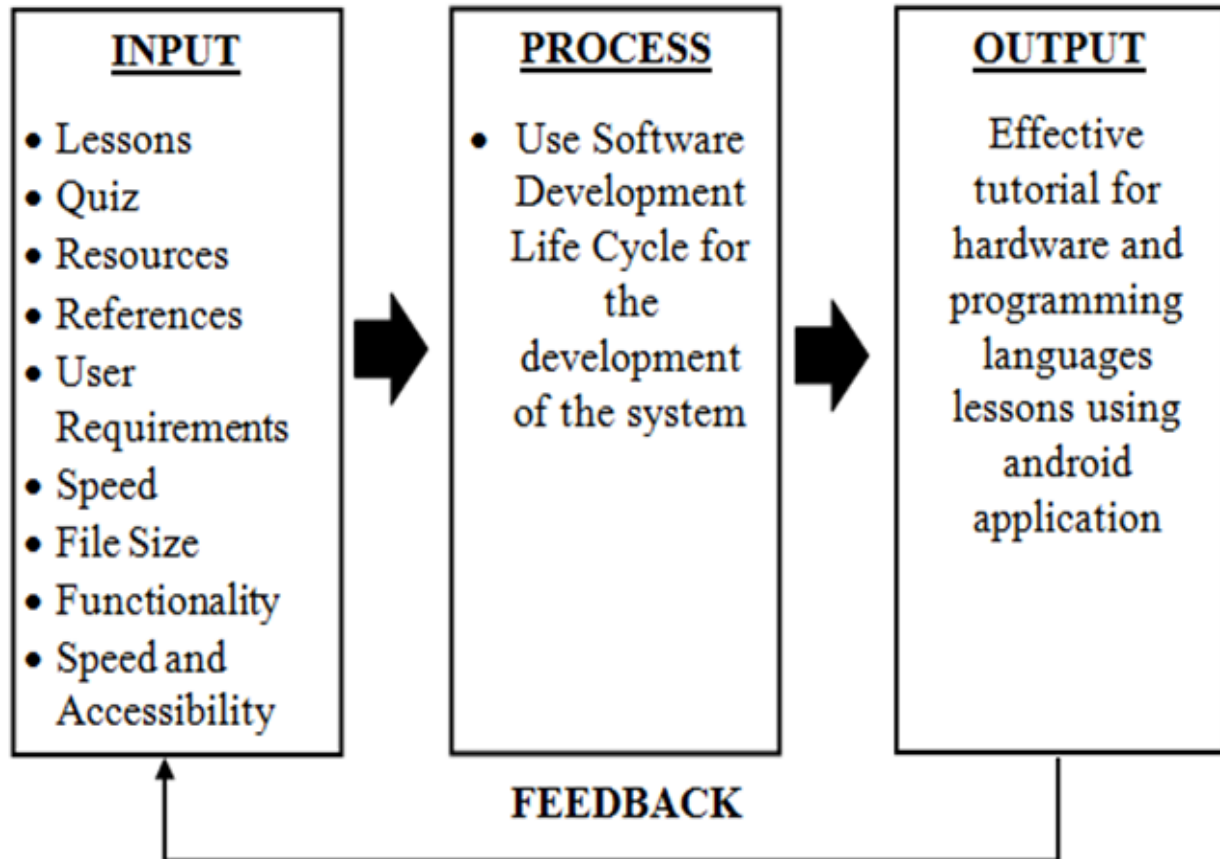


Figure 1: Research Process

The respondents of this study are the information technology students of Leyte Normal University Information Technology Department. The research design used in this study is developmental method. The researcher used waterfall model of the Software Development Life Cycle in the entire development of the system as shown in figure 2.

Waterfall Model Diagram (SDLC)

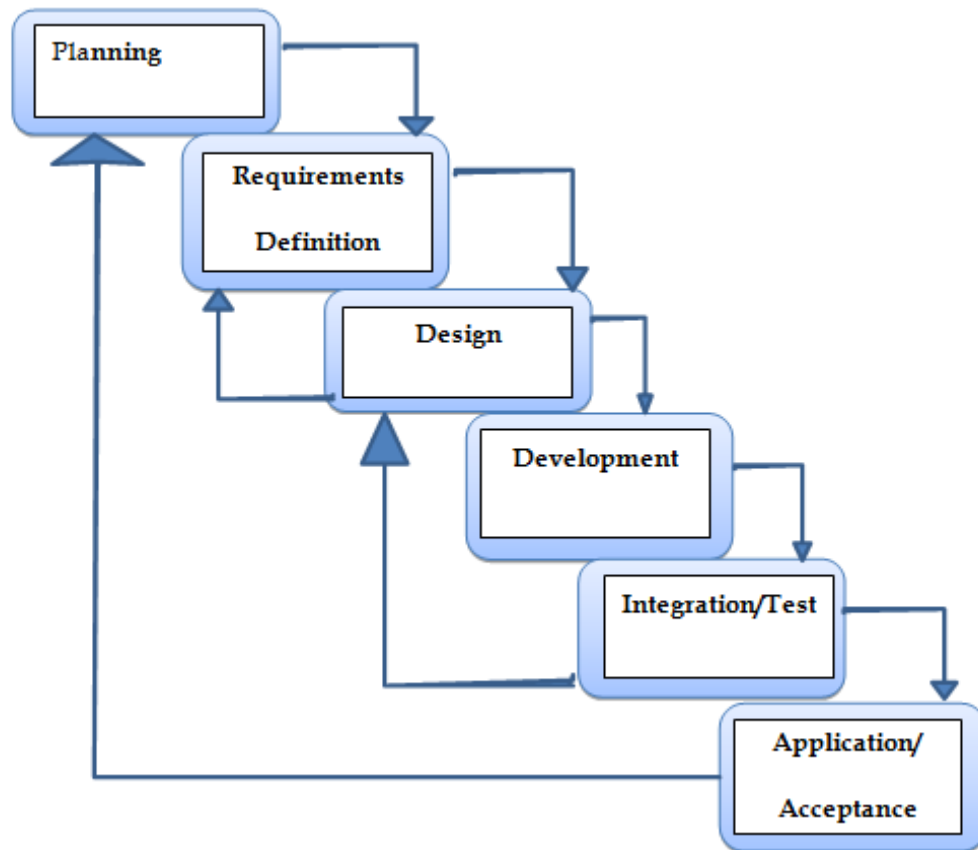


Figure 2: Waterfall Model Diagram (SDLC)

In the planning stage, necessary data and information was gathered. The researcher had come up with the idea of developing a tutorial in computer hardware and some programming languages in a form of a mobile application for the information technology students.

During the Analysis stage, the researcher reviewed the data and information gathered and started analyzing the data. In design stage, inputs and expected output were prepared, forms, layouts and file specifications were written. The researcher decided what programming language and application will be used. The researcher designed a software that will help the students in their computer hardware, networking and programming languages the easy way. After the coming up with the design, the development of the system has been started until the expected output was derived. Moreover, integration and testing occurred when the development of the system was done to check if there are bugs and errors present so that the system will be error free and 100%

operational to meet customer satisfaction and expectations. Finally, the last step is the creation of the APK (Android Package Kit) file for the installation on the android mobile phones. Once the APK is installed, the users can now use the application. Feedbacks of the users are very important for the developer to enhance the system to release new update of the system or application.

RESULTS AND DISCUSSION

Evaluation of the Effectiveness on the Functionality, Speed, Accessibility, and Reliability of the system.

Table 1: Functionality

Indicator A. Functionality	Responses					Total	Weighted Mean	Interpretation
	5	4	3	2	1			
	E	VS	S	F	P			
1. The system provides all lessons on hardware specifically Networking and PC Troubleshooting and software programming specifically, C++, Java, Javascript, PHP, Python, and SQL that functions Accordingly	(500) 100	(296) 74	(138) 46	-	-	(934) 191	4.89	E
2. The Quizzes and video in the system/software functions accordingly.	(470) 94	(324) 81	(60) 20	-	-	(854) 191	4.47	VS
SUBTOTAL							9.36	
SUBMEAN							4.68	

One hundred ninety-one of the information technology students has a sub mean of 4.68. It shows that majority of the respondents agreed that the developed system of the researcher is excellent in terms of functionality.

Table 2: Speed

Indicator B. Speed	Responses					Total	Weighted Mean	Interpretation
	5	4	3	2	1			
	E	VS	S	F	P			
1. The system provides fast access to the application without internet connection	(490) 98	(276) 69	(84) 28	-	(1) 1	(851) 191	4.46	VS
2. The System provides fast access to the lessons given	(490) 98	(328) 82	(36) 12	-	-	(854) 191	4.47	VS
3. The system provides fast processing in calculating and saving the score of the user.	(495) 99	(268) 67	(78) 26	-	-	(841) 191	4.40	VS
4. The system provides hassle free installation of application.	(410) 82	(316) 79	(87) 29	-	-	(854) 191	4.47	VS
SUBTOTAL							17.6	
SUBMEAN							4.4	

One hundred ninety-one of the information technology students has a sub mean of 4.4. It shows that majority of the respondents agreed that the developed system of the researcher is very satisfactory in terms of functionality.

Table 3: Accessibility

Indicator C. Accessibility	Responses					Total	Weighted Mean	Interpretation
	5	4	3	2	1			
	E	VS	S	F	P			
1. The system is accessible anytime and anywhere with or without internet connection.	(430) 86	(292) 73	(93) 31	-	(1)	(815) 191	4.27	VS
2. The android application system gives user friendly interface.	(520) 104	(264) 66	(42) 14	-	-	(826) 191	4.32	VS
3. The system gives internet offline setting access to tutorials and alternative online access to tutorial.	(465) 93	(332) 83	(48) 16	-	-	(845) 191	4.42	VS
SUBTOTAL							13.01	
SUBMEAN							4.34	

One hundred ninety-one of the information technology students has a sub mean of 4.34. It shows that majority of the respondents agreed that the developed system of the researcher is very satisfactory in terms of Accessibility.

Table 4: Reliability

Indicator D. Reliability	Responses					Total	Weighted Mean	Interpretation
	5	4	3	2	1			
	E	VS	S	F	P			
1. The system is reliable and runs smoothly without errors.	(400) 80	(340) 85	(84) 28	(2) 1	-	(826) 191	4.32	VS
2. The information given by the system is reliable.	(445) 89	(312) 78	(66) 22	(2) 1	-	(850) 191	4.45	VS
SUBTOTAL							8.77	
SUBMEAN							4.39	

One hundred ninety-one of the information technology students has a sub mean of 4.39. It shows that majority of the respondents agreed that the developed system of the researcher is very satisfactory in terms of reliability.

GRANDMEAN 4.45 Very Satisfactory

Legend:	4.51 – 5.00	Excellent	(E)
	3.51 – 4.50	Very Satisfactory	(VS)
	2.51 – 3.00	Satisfactory	(S)
	1.51 – 2.50	Fair	(F)
	1.00 – 1.50	Poor	(P)

For the summary of table 1 to 4, shows that majority of the respondent agree that the proposed system of the researcher is very satisfactory in terms of Functionality, Speed, Accessibility and Reliability for the total grand mean.

SUMMARY

This study aimed to use a mobile application to have an effective tutorial for hardware and programming languages lessons using android app. Through this project, it is believed that the information technology students of Leyte Normal University will enhance their knowledge more in the course and thus will have a worthy learning experience.

FINDINGS

For the data gathered, following findings were acquired:

It shows that majority of the respondent agreed that the proposed system of the researcher is very satisfactory in terms of Functionality, Speed, Accessibility and Reliability.

The following results were drawn after a careful analysis of the questionnaires:

1. In Table 1, one hundred ninety-one respondents of information technology students had a total grand mean of 4.45 which is Very Satisfactory (VS).
2. The system assures easy learning/understanding and saves time and money.
3. Almost all of the respondents agreed to the system.
4. The system can help both learners and educators.
5. The respondents will benefit the developed system.

CONCLUSIONS

The mobile application that was developed provides every lesson on computer hardware and programming languages needed by the users. The functionality of the mobile application meets the expectation of the user. The mobile application in terms of speed is fast regardless of what android operating system you use. The mobile application is accessible and reliable because it can be accessed online and offline. The mobile application is easy to use.

RECOMMENDATIONS

After a careful review of analyzing the data, the researcher recommends the following:

1. Leyte Normal University needs this kind of system to give advance understanding and new knowledge about computer hardware/software especially for the IT student.
2. This system is highly modernized needed by any learners/user and educators.
3. It is highly recommended that the proposed system must be implemented in order to improve the skills and learning of the IT students of the said school.
4. Further development of the system is strongly encouraged.

System Output

A. Offline Lessons

1. The Main Menu with the Options.



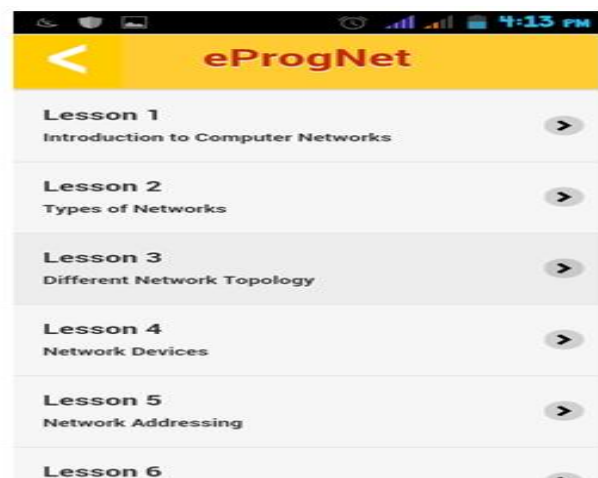
2. Category under the "Start Lesson" option.



3. "Hardware" sub category.

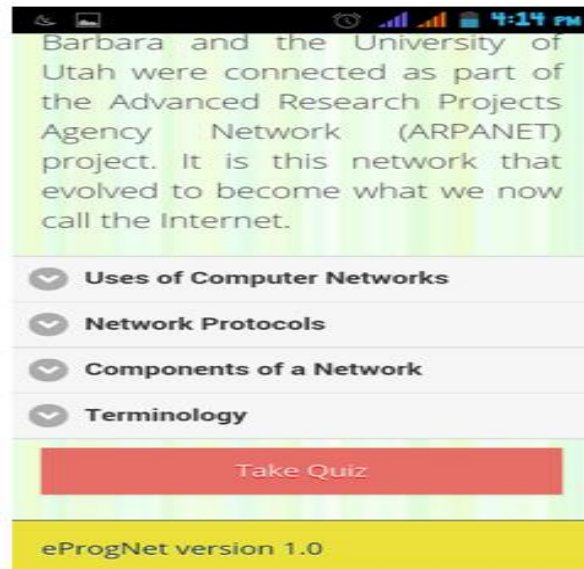


4. List of lessons under "Networking"

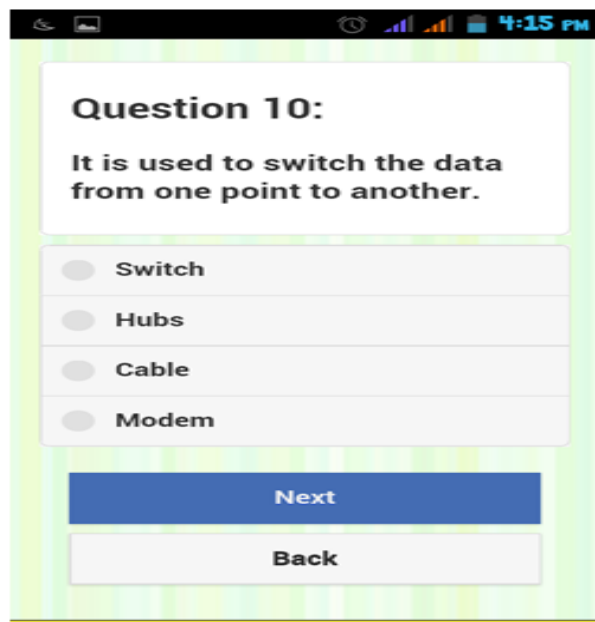
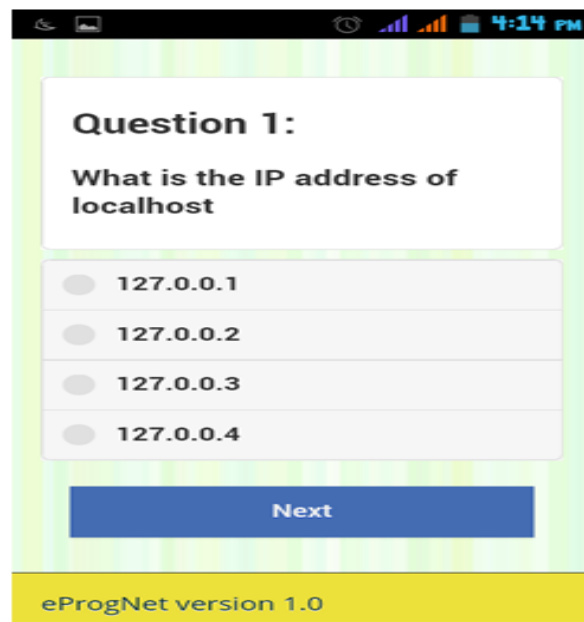


5. Lesson content of "Networking" category.

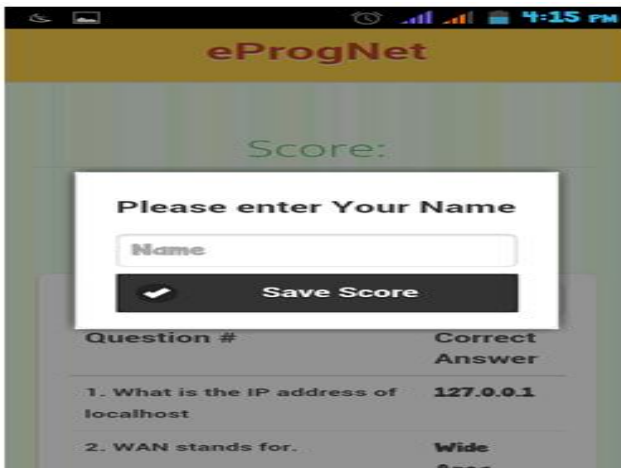
6. A quiz is provided every end of the lesson.



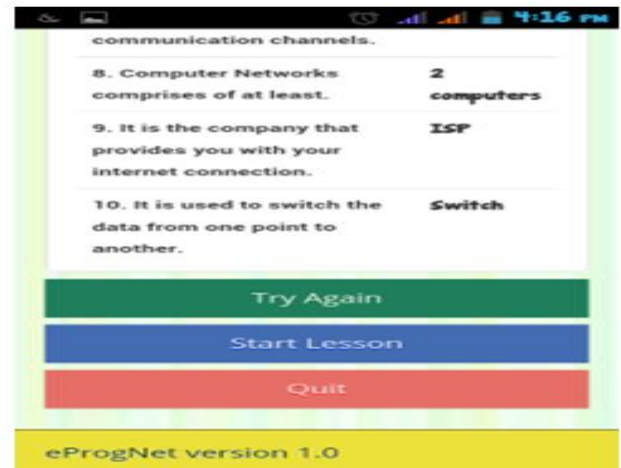
7. Random questions from 1 to 10 and the choices.



8. Saving the score.



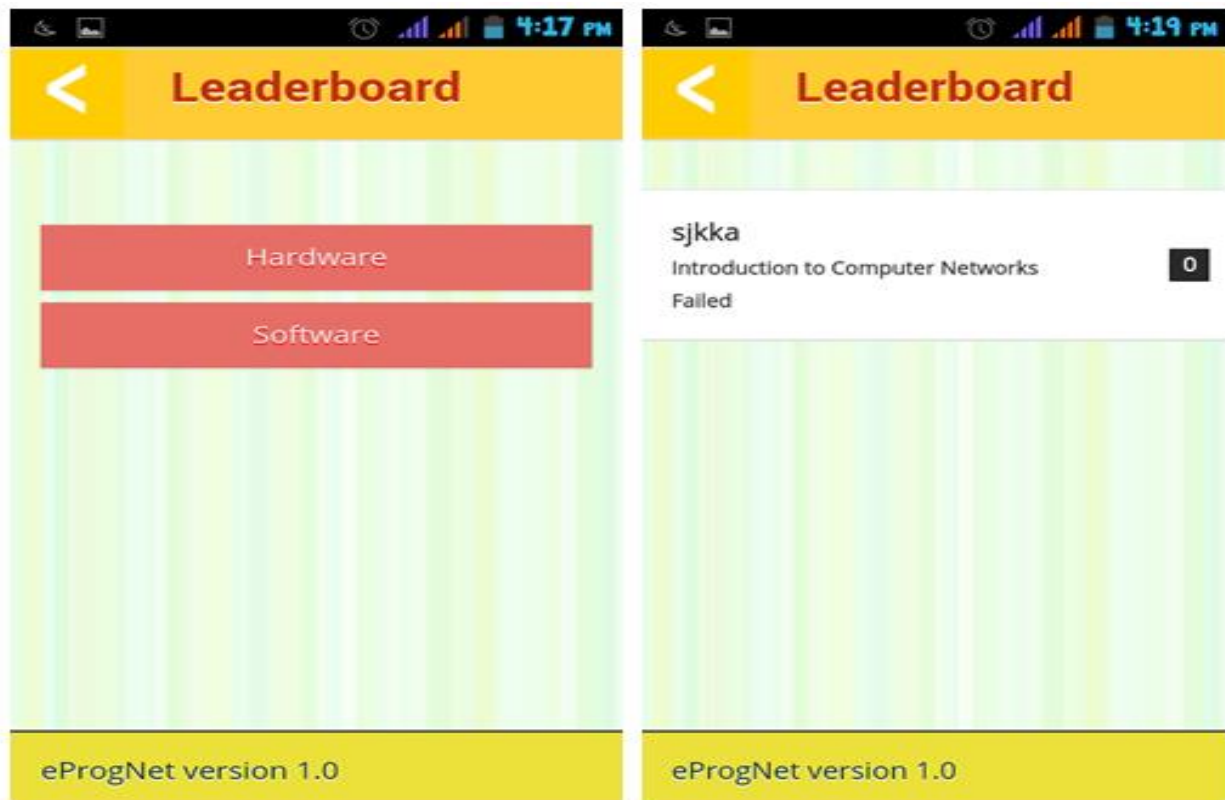
9. Display result



B. Leader Board

10. To see the ranking in the "Leader board" it will display categories. Select category; select sub category and select lessons where the quiz has been taken.

11. Display scores sorted from higher to lower if pass or failed.



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