

PRIVATE-WIRELESS LOCAL AREA NETWORK (WLAN) FOR STUDENT FEEDBACK SYSTEM

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Abstract— The developments of our society-student in universities of Kurdistan Region Government (KRG) help student's to achieve most of their duties by using of technologies for example; using of mobile devices/SMS facility make student life very easy and quick response. For that reason the extremely numbers of use the mobile technology-SMS make load on mobile communication towers. As other part of the world the rush hours is from 9:00AM to 2:00PM in universities. One of the defaults of public network is heavy load during the rush hours and creates delay of reach the SMS on time, the others are costing students. Our proposed system solves that two mentioned problems and make students to use of mobile device less. Nowadays-younger students are very comfortable with using of computer technology than ever before! Especially, the using of personal computer (PC)-Laptop and Wireless network Communications (WNC) by Sulaimani's University. The teachers and students are quickly increasing to use. The entire PCs in the Quality Assurance laboratory (QA-LAB) and the QA manager private PC are connect directly to Server. Undoubtedly, The Wireless Computer Communication System (WCCS) created an effective role in to student society and made it very fast growing in to educational sector (universities) as well as to the industrial sectors. For instance, in educational sector (universities) the WCCS modify the traditional (paper-and-pencil classroom feedback of lecturer evaluation by students) toward to WLFS (Wireless Laboratory Feedback System). Furthermore, most of the students were complaining about the uneconomic and long delay of short message service-Classroom Feedback System (SMS-CFS), because of the mobile communication users in the University campus are approximately 8000 from 9:00AM to 2:00PM. It is obvious, that amount of users creates an overload on public mobile network and affect SMS receive-time. WLFS is uncomplicated, non-traffic network and economical solution for replacing SMS-CFS and TF. Apart from that, our proposed system becomes an excellent guide for monitoring of high quality of teaching from teacher and level of students understanding in a class. Technically, thirty-five computers (clients) in a QA-LAB and QA Manager are connecting to (server) via private WLAN.

Index-Terms; Private Network, SMS, Students Feedback System; WLAN Students Feedback.

I. INTRODUCTION

WLFS stands for "Wireless Laboratory Feedback System" and uses computers to transmit Data via the medium of private-WLAN (PWLAN) technology. Data-message to and from computer has grown into an extremely popular technique of communication among university of Sulamani students and lectures. Due to the QA-PWLAN is not busy traffic and costs neither students nor teachers. The proposed system namely WLFS designed for feedback teacher's

abilities by students to improve the student's enthusiasm and produces enhanced interactivity in QA-Lab between teachers, students and QA manager.

WLFS solve the lack of students' careless due to large numbers of the students in classes; rationalize the delay between both assessment delivery and feedback. Otherwise, it activates the environment of learning [1]. However, WLAN has deployed almost everywhere today, mainly because of their enormous flexibility [2]. WLFS will systematize the feedback activity for QA manager at Computer Department. Additionally it will create an excellent Academic bridge between students, lecturer and QA manager. Thus, students can easily notify the lecturer about subject matter during an Academic year, meaning that it is an excellent idea for QA manager to evaluate the teaching quality and monitoring of students progress during the course. The successful Feedback progress only permitted for those students in the course that have baseness rate less than 10%. Inappropriate absence rate will forbidden to participate feedback activity. The teachers and students found out the WLFS are a new educational scenarios and it is mediation between technology and physical classroom or TF. Nevertheless, emphasize the role of feedback in each of their learning theories to improve teaching and learning [3]. The role of any new educational scenarios is to initiate and maintain an interactive process of presenting educational concept and their possible realization with technological tools to the teachers. Thus, its act as a 'bridge' between the world of teaching and the world of software design [5]. The WLFS is enhances and build up teaching professional at Computer Department by wireless technology. The focus on technology should be working and not only must the technology is easy to use; it must also be useful and working properly, otherwise technology that is not working properly can create frustrations and disrupt the learning process [4]. The equipments simplicity and privacy of the proposed system create higher level of fault-free, if compared to other technology such as Bluetooth, short message service (SMS) etc. The paper starts with the background used for this research. Then, a brief description of the system as well as the operation environment specification with trial that took place, subsequently a discussion of the survey results is present. Finally, the paper finished with a summary and conclusions.

II. BACKGROUND

Before Information Technology (IT) revolution, the TF activities were in the physical style in classes; therefore, the performances, availability, and quality of services (QoS) of TF

were in a very low stage because the communication facilities were very primitive.

At that time, the only way for students to feedback his/her teachers is by words of mouth, it was asking questions like "How far you understand this parts" were unclear results and not useful outcomes for both students and lecturer[1]. The main problem with this very primitive TF is time; it is very difficult to approximate the necessitate time for achieving feedback. Furthermore, time-consuming in the primitive feedback generation relies on the activity of the students and feedback-organizer. The active students and feedback organizer needs less time to work out result than the passive students and feedback-organizer, for that reason the computer department at Sulamani University concerned by the lack of traditional feedback (TF) with inappropriate; results, speed, space, cost, time and unreliability and all modification occurred from past until now is create new generation. There are several types of modification in students' feedback system, which are:

a) Traditional Classroom Feedback: In this type of feedback generation, Head of Department interview group of students in the class and ask students about teacher ability, teacher attitude and level of understanding from the model. All information from the interviewed students regarding the teacher model weakness and strength collect as notes by Head of Department subsequently let the teacher know everything about his/her progress in class. This activity occurred occasionally, for example in the Sulamani University until 2008, the feedback activity only for those teachers that the total students' pass-rate is not above to sixty percent, those teachers that students were complaining about him/her or Head of Department not going well with the teacher. Herewith the outcome of the feedback is faulty and unfair. The feedback system is in a very traditional way is make waste of time, space, place etc and performance is in the low stage and very changeable because the activity of human is different from person to other.

b) Mobile feedback system (MFS): Using of mobile phone technology or facilities such as Bluetooth, Short Message Service (SMS) for the reason of feedback teacher by students, It is much better and faster then the physical Feedback or TF. However, the main problems with MFS are costly and the level of message delay is higher due to the traffic or overload on AsiaCell public-network Communication in the Sulamani University. Nonetheless, SMS facility for feedback system is more suitable then Bluetooth because the Bluetooth is very limited and not as powerful as SMS.

c) Feedback over Wire-LAN or Wireless-LAN: implementing and replacing of WLFS rather than the SMS or Bluetooth Feedback system is an excellent solution of delay and cost. The public Asiacecell network (mobile communication company) is very popular and busy network in Sulamani City especially in the University camps. There are approximately eight thousands students and staffs are available at the University campus from the 9 AM to 3 PM in weekdays and all of them owning and using AsiaCell Mobile. The overcrowded in the AsiaCell public network at the University campus is one of the factors of SMS delay. The idea of WLFS or Wire-LFS over the private QA wireless network to solves the SMS delay and students not spend any penny for feedback activity and controlling the results of feedback because of the limited time of feedback activity Figure 1 shows the WLFS Infrastructure.

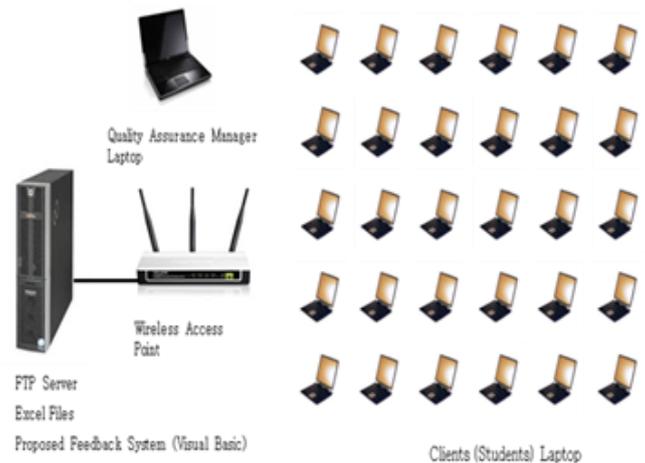


Fig1 the WLFS Infrastructure

III. WIRELESS LABORATORY FEEDBACK SYSTEM

The proposed system designed and implemented on the QA manager Computer in the client/server base. The installed copy of the feedback software system on a single QA computer namely server side via wireless networked computers technology connected to thirty-five PCs (clients) in the LAB. WLFS is much popular because it is tidier than Wire-LFS and cheaper to install and maintenance.

Generally, there are two feedback features in proposed system that directly related to each other. The first feedback feature is system feedback (software) and the other is feedback of wireless (hardware). The first feedback feature (Software) is programming part and designed by Visual Basic for the reason of develop Quality of learning. However, the wireless feedback reply-rate between Antennas is measure by bit per seconds [6]. In order to Increase Feedback reply rate and keep away from system delay or error between a server and clients, the extra Antenas should be employ to improve QoS and create a powerful, reliable communication. The better feedback reply communication between Antenas will help to run an excellent WLFS. WLFS is more reasonable and becomes very popular, if compared to other technologies (Bluetooth, SMS) because all the others technologies create faults in the communication and very limited in distance and capacity, etc. The QA-LAB will be open twice a year for duration of three days from 9 AM to 3 PM at the end of each semester. The back-end is a backbone of any new technology systems especially for three-tier and two-tier Architecture. The step that has highest priority in the proposed system establishment schedule is the design of back-end module, because most of the errors in the systems return to the inaccuracy of back-end module. Ms-Excel is a very simple and an outstanding tool to store all data. The technology used in this proposed system to link to Ms-Excel is Visual Basic with window 7. Figure 2 shows the basic pictorial representation of the used tools to establish the proposed system architecture. The Ms-Excel used as an Application to create interfaces that the students interact with, Visual Basic programming language is powerful and easy to use software, and handle the link tasks, calculating, archiving and report-printing. Figure.3 shows the suitable and more reliable is Two Tier Architecture-Thin Client Model.

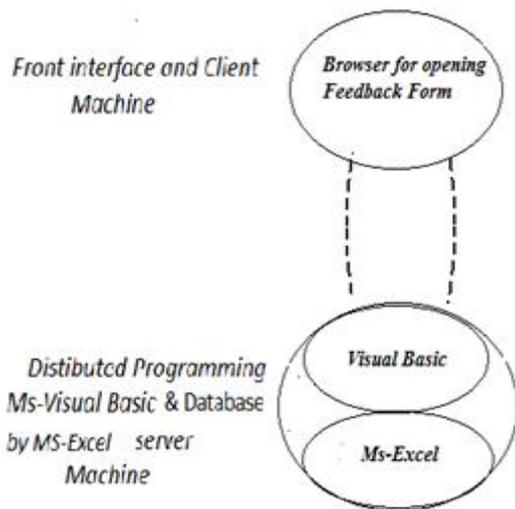


Fig 2 the used Software development tools

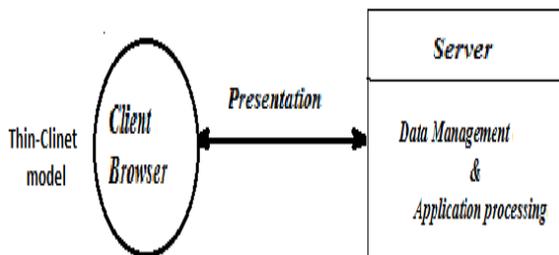


Fig 3 Thin Client Model –Two Tier Architecture

Almost all of the work of WLFS takes place on the server. All the used tools should be support by the operating System (OS); the File Transfer Protocol (FTP) Server, programming languages and Backend server must be familiar for the selected OS. The main component of the interface home page category includes twelve questions about the teacher. The participated students must read carefully and respond all questions regarding to the particular teaching model. The numeric evaluation in the system endow with the ability to answer a range of twelve presented questions on (client). Participated students must use <ftp://wlfs.com> to view the interface and answer each twelve question with simple numbers start from numbers [1 or 2 or 3 or 4 or 5]. Before feedback activity, the QA manager should give explanation regarding the numbers [1 to 5] levels. the twelve combo box in e-form must be answer by selecting one number [1 to 5] in each box by the participated students A part from numeric responds, if any student very keen to send a comment they have to note down all comments on a specific column next to numeric column. The numeric respond of twelve questions by students only take into account for evaluation the level of teacher capability, but the comment responds by students only for concerning the weakness and strengths of the teacher in the class. The pretty of this proposed system is blocking all bad language and fliter all words in the comments column. Fig.7 shows the electronic form with twelve selective combo boxes number [1 to 5] in Kurdish language. Category interface at the home page has the following major inputs, functionality, and outputs:

Inputs:

1. The participated students should get username and password at the QA-LAB entrance in the specific basket and select only one pices of paper randomly before

setting in front of a computer

2. The correct username and password by any student can enter to the system.
3. Students double click on any available browser in the Desktop and type the URL namely <ftp://wlfs.com> at the address bar.
4. The opened file, the student must fill up all preselected cells. One column for numerical answer, but the column next to it is for comments.
5. After answer, all preselected coloumn by student, or very keen to write a comment regarding his/her teacher, subsequently students must save and exit excels file. and leave the LAB.
6. All the excel files will save in the server side automatically.

Functionality:

1. Numeric Answer: the system will calculate and find out the final average of the all twelve questions into the Ms-excel which answered by each student. Furthermore, the system finds out average results of all students form. All calculation achieved in the very short time (several seconds)
2. Proposed system filters the bad language (words) and only shows the Dictionary words.
3. Comments Answer: The system will send the numerical result, also filtered and send all comments to Ms-word and save or printed.
4. Limited numbers: from numbers one to five will accept by system and above of number five will be cancel (real numbers from one to five).
5. The use of 2-tierArchitecture in thin client model is more than enough to organize the workflow of the system. Thus, the number of students is only (35 students) and 2-tier model is suitable for the proposed system load balancing fig.3 shows the suitable Architecture.

Outputs:

1. Result: All results include (Feedback average and comments) printed by the QA manager and give to the teacher directly. Alternatively, the easier way is to email to the teacher.

Specifications and Aspects

1. Allowable students for participate feedback activity must have a username and password to login to the system fig4 shows the flow chart of students participate.
2. Students can enter answer to the frontend (Ms-Excel) through the correct username and password to login to the form.
3. QA manager must have a special username and password and must be different then students username/password (strong password).
4. QA manager can enter his/her special and correct username and password to get through to the proposed system.
5. QA manager can easily click on the calculate button to find result of teachers.
6. System administrator is a QA manager can login via special user's name and password fig.5 shows the flow chart of QA manager as administrator.

Finally the fig.6 shows the general function of the proposed system.

IV. OPERATION ENVIROMENT SPECIFICATION

The general environments specifications of our proposed system are:

- a) **Hardware Environment:**
 - One Computer Server (FTP Server)
 - Thirty-five Client Computers (Laptop)
 - One Wireless Access Point
- b) **Software Environment:**
 - Any Browser (Frontend)
 - File Transfer Protocol (FTP) Service
 - Microsoft Excel (Backend)
 - Visual Basic {For design the Proposed Feedback System (Backend)}

Figure4.1 illustrates a basic diagram system: Namely, Wireless Laboratory Feedback System. The backbone hardware of the environment wireless technology is (Wireless Access Point) tool; it is create an active bridge to connect hardware and software. Apart from Wireless Acces point, all others components mentioned above in sections (3.1 and 3.2) should place in to two different computer machines. All software must download on server side except web browser placed in client side. Visual basic (middle ware) and Ms-excel (database) must be at server side. Thus, the two-tier architecture is suitable Architecture for our proposed system because the number of participated students for feedback activity is less than fifty students. The aboved hardware and software over the thin model-two tier architecture solved the problem of teacher’s feedback by students. In fact, our proposed system is not pure E-learning but it is in between (traditional and Electronic) learning or blended learning. The pretty of our proposed system doesn’t cost that much of money but it solved a big problem of students as well as a teacher also very simple to everyone.

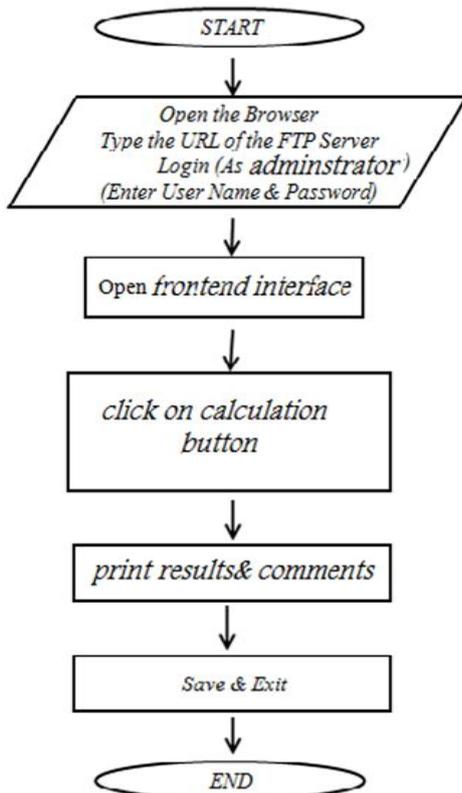


Fig. 4 the flow chart of Students login

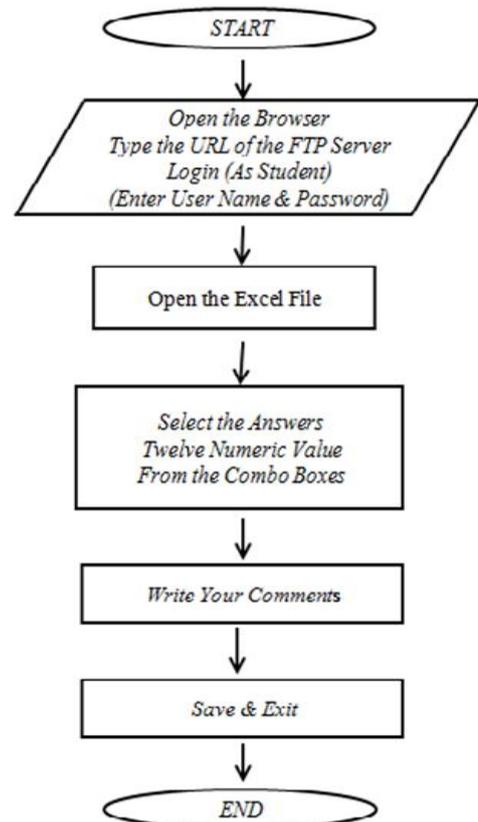


Fig.5 shows the flow chart of QA manager as administrator

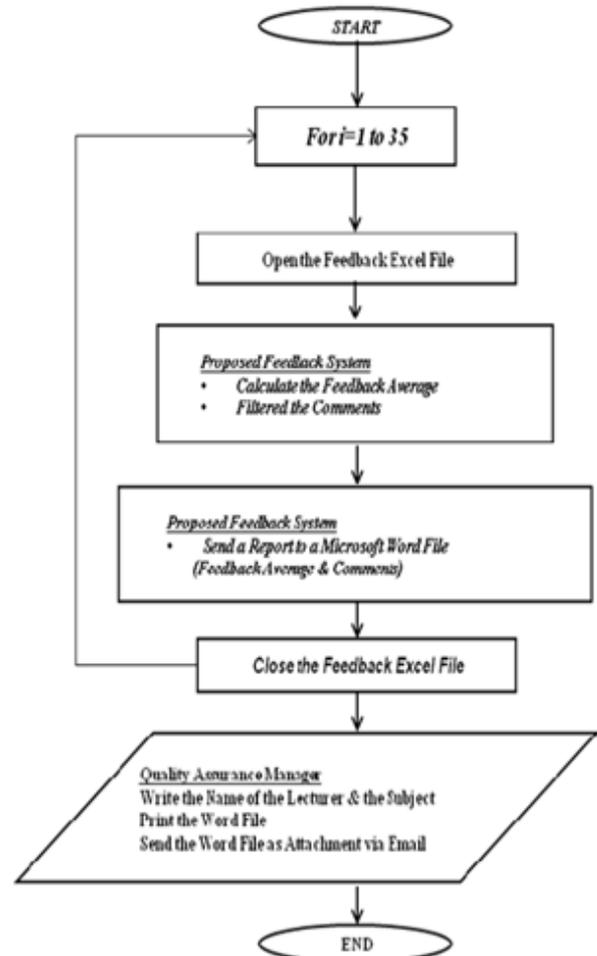


Fig. 6 General Function of Proposed Feedback System

V. RESULTS AND DISCUSSION

The seminar-evaluation for our proposed system took place in the QA-LAB in Computer Department, Science Faculty at the Sulamani University with thirty-five participated final stage students. The general purposes of the seminars were to offer training and find about how to work out to use of the system. The proposed system software application must run on the better capacity computer server with [ftp://wlfs.com](http://wlfs.com) domain name. Any students with correct user name and password can login to the system, subsequently typing the domain name in the browser address bar of client's computers and eform in fig.8 that appear and students.

As we mentioned that AsiaCell is a public mobile network and the traffic network is very high in the Sulamany University due to 8000 students and staffs in University create rush hour communication especially for SMS that receive in longer time. In order to solve, the students and QA Manager complaining of the costly and delay of SMS-CFS and FT we thought about the private wireless network for feedback system. The WLFS were very good and much better than other TF, M-feedback system. After fifteen minutes all e-form will receive to the server. The QA manager (as administrator) login to the system and simple click on calculate button to find out the result of the feedback and takes one seconds. Comments doesn't affect the results of numeric evaluation and in order to Workout results in TF takes more than an hour time with as a minimum of two people working to calculate the feedback results, but the WLFS takes only one seconds. It's obvious the WLFS is errorless and more accurate.

eform from clients and receiving to server is not delay at all). Selected one of the numbers [1 to 5] in twelve combo boxes and simply save it. This means that, our students will not use TF and SMS-CFS because the WLFS is an excellent replacement of TF and SMS-CFS.

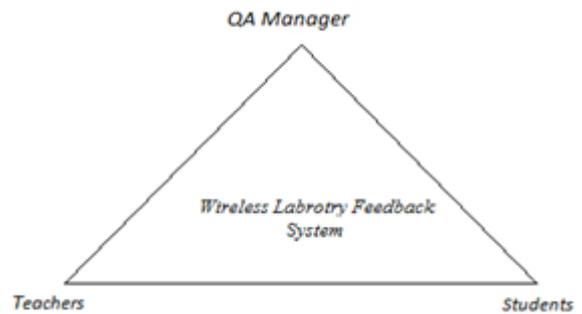


Fig.8 Enhanced Triangle learning of three parts

VI. CONCLUSIONS

Behind schedule of receiving text from students mobile to the QA manager mobile is create a lack of electronic feedback activity. The public AsiaCell signal network is poor especially at rush hour in the University Campus. The WLFS solve the TF and SMS-CFS also create an active academic bridge between students, teachers and QA manager for the reason of enhance the level of learning and encourage learners to participate toward WLFS. Although the face-to-face (traditional) feedback SMS-CFS and WLFS tests; the system tested a seminar evaluations and the results model of two-tier architecture is best architecture and response time is very low. The technology has a g *great role in feedback activity. Our future work is to test three and N-tier Architecture.* of WLFS were better results. The use of Ms-Excel instead of Database returned of user friendly of Ms-Excel. The thin

	TF	SMS-CFS	WLFS
Number Of Students	35	35	35
Feedback from return time	15 minutes	At least 15 minutes	Less than 15 minutes
Number of staffs Required	At least 4 staffs	At least 2	1 person should be QA manager
Calculation Time Needs	Roughly 2 hours or more	Less than 2 minutes	Less than 2 seconds
Error Expectation	Yes	NO Correct & accurate	No Correct & accurate
Cost	Very costly and untidy	Cost students and that is unfair	Free of charge

TABLE.1 TF, SMS-CFS and WLFS Comparability results test

The entire results from the system provide an outstanding idea to become conscious that Collaboration between three parts, namely QA manager, students and teachers makes feedback Approach to improve because of the proposed system is a faultless middleware between three parts: Namely QA Manager. Students and Teachers, Fig 9 shows elucidate the improvement of learning strategy.

The time limit of duration is fifteen minutes for feedback activity and the traffic network is zero (Sending

ئەروەسەى دۆنیاىى جۆرى / فیدباكى خۆىندكاران					
			زانكۆى سۆىماتى	ناوى زانكۆ	
			فاكۆلتى نۆندازىارى	ناوى فاكۆلتى	
			بۆشى شارساتى	ناوى بۆش	
Programming		ناوى بابۆت	م. نارى انور نجىب		ناوى مامۆستا
	ئۆبۆنى	ذمارۆى خۆىندكارى رىذۆى نامادۆتۆبۆنى لۆ 10% زىاتۆرۆ	ذمارۆى خۆىندكارى نامادۆبۆو		ذمارۆى طۆشئى خۆىندكار
	ئۆبۆنى	ناست (5 - 1)	ئۆسىارى هۆسۆساتانن	ذ	
		5	يەىام و ئامانجەكانى كۆرسەكە رۆون و ئاشكرا بۆون؟	1	
		5	ناوېرۆكى بابۆمەكان سوووبەخۆش بۆو؟ يەوۆندى بە ئامانجى سەرمكى كۆرسەكۆرە هەبۆو؟	2	
		5	مامۆستای وانەبۆۆر خۆى بە يەرتۆوكى كۆرسەكۆرە مائۆو كۆرئۆو	3	
		5	مامۆستاكە لەمكاتى وانە كۆرئۆمەدا هەولیدا پۆنسۆب و ناوېرۆك وخالە كۆرنگەكانى بابۆمەكە بە جۆانى و بە سادەبى سۆبۆكۆمۆه؟	4	
		5	مامۆستاكە لەمكاتى خۆیدا هاتە وانەكمى لە كاتى خۆیدا وانەكمى تەمۆركۆر؟	5	
		5	لە كاتى وانە كۆرئۆمەدا مامۆستا بە هۆمنى و نەرمى و رۆۆرئۆنۆمۆرە هەلسۆكۆمۆتى كۆر؟	6	
		5	ئۆم سالاىدانى بەكار هۆنران رۆون و ئاشكرا و سەرنج پراكۆش بۆون؟	7	
		5	مامۆستا كاتى پۆسپار كۆرئۆى هۆشۆمۆرە و هەولى دا پۆسپارەكان بە ئۆرۆتەسۆطى وەلام بەاتۆمۆه؟	8	
		5	مامۆستاكە كۆرنگى بە رەخنە و كۆبۆبى قۆتابۆبە خۆىندكارەكان دەدا	9	
		5	زانپارى لۆسەر سۆۆازى تاقۆكۆرئۆمۆكان بەباتى بۆۆشكۆمۆشكرا بۆون	10	
		5	پۆسپارەكانى تاقۆكۆرئۆمۆكان رەنگدانۆمۆهى ناوېرۆكى كۆرسەكە بۆون	11	
		5	سەرجاوەكانى خۆىندۆمۆرە نۆۆن و لەمگۆل ناوېرۆكى بابۆمەكە دەكۆنۆبۆن	12	
5.00		60	كۆ و ئۆكرای نۆمۆرۆ	خالئى بەهۆۆر و كۆم و كۆرئۆمۆكان :	
ئۆبۆنى: نۆبۆه					

Fig.7 Electronic Form with twelve selective Combo Boxes [1 to 5] in Kurdish