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Computer Applications in Formative Assessment: A Gender-based Comparison at Postgraduate Level

Nasrin Akhter[*] and Qudsia Fatima[**]

Abstract

Computer-based assessments have considerable potential in assessment. This study explores the perceptions of 500 post-graduate students, noting gender differences where appropriate, in relation to the role of computer applications in formative assessment. Using questionnaires and interviews, the data reveal that the student perceptions of the role of computer applications are highly positive. However, their understanding of the nature of formative assessment is very limited while they reveal a very narrow range of experiences of assessment formats. They seem to express frustration at lack of accessible reliable computer resources, with friendly software, and they express a need for training, for themselves and for their teachers.

Keywords: Formative assessment, teacher education, technology, software applications

*Assistant Professor, University of Okara, Pakistan. Email: nasrin_cs2005@hotmail.com
** Assistant Professor, University of Education, Lahore. Email: qudsiaedu@gmail.com

Introduction

The modern computer technologies have been applied widely in all areas of life, allowing many tasks to be undertaken that were previously too time-consuming while providing a tool that has extended the intellectual powers possessed by humans. The widespread use of word processing packages, spreadsheets and presentation packages have altered the way teaching and learning can now proceed. However, the internet has generated very subtle changes. Not only has it offered access to knowledge about almost anything at the touch of a button, it has changed the way knowledge itself is viewed. Given that any information can be easily found, the importance of what we know and remember diminishes while the ability to search for that information and evaluate its validity and usefulness become important skills (Johnstone, 2003).

The rapid developments place great demands on teachers. However, teachers do *not* decide the curriculum, they do *not* decide the assessment systems to be used and they do *not* decide what computer equipment and software selection those are to be made available. Therefore, teachers, have only a marginal influence on the way ahead. Much is determined by decision-takers *outside* schools. Inevitably, levels of competence and confidence among teachers are vitally important while access to quality equipment which is reliable is critical (Khurshid, 2012). The new technologies offer exciting possibilities but there are potential problems. Some of the areas of potential are summarised in "figure 1".

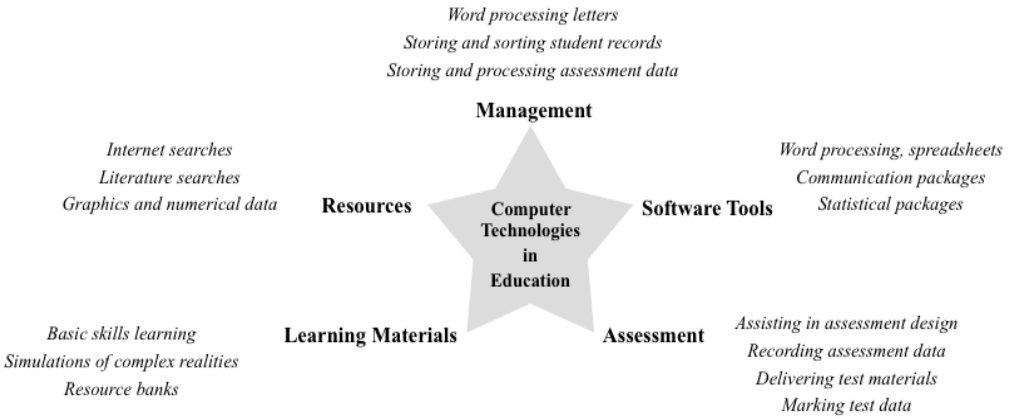

Figure 1 Computer Technologies in Education

For successful use of computer technologies in education, certain key conditions must be fulfilled:

(a) The right equipment must be readily available when needed and must be reliable.
(b) The learner (and teacher) must be aware of the potential of the resources and must be competent and confident in using the equipment and software.
(c) The software must be able to carry out the tasks required in an educational setting with speed and reliability while it is essential that it be user-friendly.

These conditions are important when considering assessment and, specifically, in formative assessment. Here the assessment is an integral part of the learning process and is designed to inform the learner and teacher about progress and is not used for purposes of grading or making awards (Bull & McKenna, 2004).

In colleges, part of this formative assessment may relate to essays and assignments written by students. However, assessment tasks can be downloaded by students, answers submitted by students, marked online by teachers and outcomes returned to students electronically, with potential benefit to students (Johnstone, 2003, Barker, & Astray, 2006; Kay, 2008; Sanders, 2006). However, Kluger and DeNisi (1996) quality hardware and software are critical as well as the development of the skills of teachers in developing quality assessment tasks and the need for effective feedback mechanisms.

The focus in this study is very much on formative assessment. In order to explore the potential in education colleges in Pakistan, this study seeks to consider how students see themselves in relation to their performance in formative assessment practices using computers and what difficulties they encounter.

Background Literature

Formative assessment can be seen in terms of assessment, integral to the learning process that seeks to pinpoint strengths and weaknesses so that future learning can be directed. In culinary terms, it is formative when the cook tastes the food during the cooking while, it is summative when the guests taste the food. Formative assessment focuses on the processes while summative focuses on the product. Books on formative assessment have multiplied in recent years, a recent example being Boyle and Charles (2014), often the aim being improved learning (Black & Wiliam, 1998). Forms of such assessments have been described in some detail including: students work samples, written essays, assignments based on the information gathered from internet, writing journals and online quizzes (Johnstone, 2003). However, the key to its success lies in the quality of the feedback given to learners (Black &Wiliam, 1998; AfiL, 2003) and that has major time implications.

The importance of assessment in relation to learning is stressed by numerous authors (Muwanga-Zake, 2006; Warburton, Nicol, & Bredin, 2006) and e-assessment is growing in importance (Bull, & McKenna, 2004). Harlen and James (1997) appreciated the potentially positive impact that might be made by formative assessment, directed as it is towards promoting learning. The computer can make an impact here, and they note several potential benefits: the provision of immediate feedback; the potential in motivating student learning and possibilities in making learning more exciting. The key areas of difficulty include: inadequate number of computers, technical problems, needs for teacher training, time demands, and cost.

In considering gender, older studies frequently note gender differences (Kay, 2006), with the majority showing greater male positiveness. Later, Kay (2006) and Ud-din (2015)observed that males, prior to enrolling in a pre-service teacher laptop program, reported having significantly greater skills than females in higher level computer activities (operating systems, databases, creating web pages, and programming), but not in basic office skills (word processing, spreadsheets, e-mailing).

The assessment systems in Pakistan have featured in numerous studies (Warwick, & Reimers, 1995; Rahmani, 2003). At a global level, many research studies concluded that assessment is a vital important element that drives the teaching and learning process (Callaghan, & Graney, 2001; Lamprianou, & Christie, 2009). However, in many Pakistani schools, it is considered that teaching is driven by testing and testing is driven by recall, leaving learning driven by memorisation (Hoodbhoy, 1998, 2009). The question is the extent to which computer-aided formative assessment has the power to change this.

Objectives of the Study

This study focuses on postgraduate students and how they perceive the role of the computer in formative assessment. Specifically, it seeks to explore:

- The potential of computer applications in formative assessment.
- Any gender differences in using computer in their formative assessment practices.
- Difficulties in using computers in formative assessment practices.

Of course, there is no certainty that students' perceptions exactly match reality. However, their perceptions will influence what they do and, more importantly, what they take from their college experiences as they progress into schools.

It can be argued that education must prepare young people for the future. This is not easy, given the pace of change in the world today. However, there is no doubt that new technologies are making major changes in almost every area of life. This includes how learning is assessed. One major issue is the potential for the new technologies to reduce teacher workload, but how does this balance with the time demand in setting up formative assessment schemes on computers? Another issue relates the quality of the assessment that can be offered. In many universities worldwide, students can now download assessment tasks and submit their work online; with their tutors returning feedback and comment (Quality in Higher Education, 2010). Is it possible that the day is soon coming when students enter the examination hall and are given iPads? They download the assessment tasks, type in their responses, upload these responses and are given their score, with feedback more or less instant? In a Pakistan setting, these exciting possibilities can only happen if the right equipment is readily available and the students are competent and confident to use it. This study inquired the questions through closed-ended questionnaire and interview. Have they been trained? How do they see the software? Is the equipment available? Do they have any real understanding of the power of formative assessment to enrich their learning? Thus, this study focuses on how postgraduate students feel about the way ahead, especially the context of formative assessment.

The Research Methodology

This study employs two research methods as:

(1) A questionnaire was conducted with 500 postgraduate students
(2) An interview was conducted with 20 education postgraduate students

The large questionnaire sample (n = 500) allows for gender comparisons moreover the interviews allow for in-depth exploration of the key issues. The overall aim is to gain an accurate picture of the perceptions of the student population in relation to the potential of the use of computer technologies in the specific area of formative assessment. The questionnaire was piloted with a small number of students (n = 50) and minor adjustments incorporated. This helped to check the clarity of the questionnaire items, instructions and layout as well as gaining feedback on the validity of the questionnaire items. Later on, the interviews allowed issues identified by the questionnaire data to be explored in a greater depth.

The Findings from the Questionnaire Data

A list of all the aspects/themes of computer based application (particularly used in the Pakistani classroom) on formative assessment were drawn up by reviewing the literature. The item statements were constructed for the questionnaire to

explore the lists of topics, formative assessment strategies, advantages and difficulties using computer-based applications in classroom assessment. The questionnaire contained 4 sections, each focusing on one broad aspect related to the issues under consideration. The first section asks their opinions about learning by using computer applications in formative assessment. The second section asks their opinions about the usefulness of using Computer Applications in Formative Assessment. The third section asks their opinions about what they found difficult using computer applications. Finally, the fourth section seeks that computers may be able to help in formative assessment in many ways.

In fact, a Cronbach's Alpha gave a value of 0.87 means that the items are functioning in a fairly consistent way within the test. Overall patterns of responses from the questionnaire are summarized in the form of percentages. Then any gender differences are explored using chi-square as a contingency test to check for significance.

The demographic make-up of the sample is summarized in table 1.

Table 1

Demographic Makeup (N = 500). All the data is presented in the form of percentage for clarity

Area of Study		Age		Gender		Program	
Subject	*%*	*Range*	*%*	*Gender*	*%*	*Time*	*%*
Science	29	20-25	87	Male	40	Morning	52
Education	53	25-30	5	Female	60	Evening	48
Business	18	31-35	7				

The first three sections employed items laid out in the Likert (1932) format while the final question asked respondents to select the 3 most important features out of 10. The data are present section by section.

All the variables are ordinal in structure. Firstly, the descriptive statistics can be run to explore the responses in each category. Independent Sample, Mean and standard Deviation and *t*-test cannot be run but the chi-square is suitable non-parametric statistics to run with the categorical variables in the data (Reid, 2003). As Reid (2006: 13) stated "It is not right to take a mean of categorical data and, even it was, the result must be quoted to the level of accuracy of the input data. It is clear that the means are meaningless. A contingency chi-square test on the distributions confirms that the two distributions are, indeed, significantly different." Finally, the observations are brought together to present broad conclusions. All statistical calculations were carried out using frequency data. However, for simplicity, data are presented as percentages to nearest whole number.

Table 2
Learning by using computer applications in Formative Assessment

	Items	SA	A	N	D	SD
	N = 500	%	%	%	%	%
1	I enjoy using a computer	51	21	9	9	8
2	When needing information, I turn to the internet frequently	41	18	7	18	13
3	I find the computer assists my learning greatly	40	23	14	10	11
4	I find a word processor very helpful to me in my work	40	24	3	10	21
5	I prefer reading a book than learning from a computer	37	25	3	13	17
6	I like to do web searching on a computer	37	26	59	9	19
7	Computer skills are essential for everyone today	38	28	9	13	8
8	Computers are making us lazy learners today	79	9	3	3	4
9	I do not use a spreadsheet (like EXCEL) very much	79	7	6	3	2
10	I find a package like PowerPoint frustratingly complex	75	10	3	5	3
11	I am confident with typing at the computer	41	15	16	18	8
12	I use the internet to up-date my knowledge	48	16	13	13	8
13	I think that all assessment could be conducted on computers or iPads	32	10	6	33	15
14	I find it easy to do academic work on a computer	44	23	2	17	12
16	Knowing how to find things is now more important than knowing things	59	9	5	13	11
17	The computer has great potential in assessing my progress	61	11	3	12	10
18	The computer has great potential in revealing what I need to learn in the future	64	8	3	10	11
19	Computers will give very accurate assessments	63	15	3	10	5
20	I need training in how to use computers to assess	56	20	6	8	6
21	The problem is assessment using computers is my lack of computer confidence	56	16	3	10	12
22	The computer can speed up assessments	50	16	8	11	12
23	Security is a serious problem in using a computer for assessment	56	16	9	10	6
24	I prefer to write by hand in assessment tasks	42	24	11	12	7
25	Computers would make all assessments become like multiple choice	44	26	12	9	7

Many positive features are evident but, in most cases, significant minorities do not share the general views. Thus, computers are associated with enjoyment and helpfulness while participants appreciated that knowing where to search is now an important skill. The value of word processing was "appreciated" but there is strongly negative reaction against Excel and PowerPoint, the latter being seen as far too complex. There is some ambivalence in relation to internet usage. This almost certainly reflects three factors: the lack of easy access, the unreliable electricity supplies in Pakistan as well as lack of confidence in knowing how to web search.

The participants are aware of the possibilities of using computers in formative assessment and, specifically, in assessing progress and revealing future learning requirements. However, they are less confident in knowing how to use computers in assessment and they seek training. Interestingly, majorities still prefer written assessment tasks, and they are concerned that assessment might end up looking like multiple choice. Perhaps, the latter fear creates the former preference. While they see the value of speed, they are somewhat concerned on security aspects: there is no certainty about who completed the assessment. Perhaps most striking of all is that they simply do not see the potential of assessments being conducted using iPads. Lack of experience may lie at the root of this uncertainty.

Table 3

Usefulness of using computer applications in formative assessment

	Items	SA	A	N	D	SD
	N = 500	%	%	%	%	%
1	I like having regular small assessments rather than one large assessment	20	32	6	32	6
2	I like assessments that can be used to help my future learning	13	61	8	7	9
3	I prefer formal written assignments	32	35	8	10	12
4	I much prefer writing my assignments at the computer	29	40	9	10	10
5	Too many assessment make me anxious	27	35	9	12	14
6	Computers restrict the formats of assessment that can be used	1	34	22	22	18
7	Computer based assessments allowed many different skills to be assessed	18	39	13	28	1
8	I find Microsoft Word a hindrance in completing assignments	6	67	10	10	9
9	Computer-based assessments are fairer	4	72	6	9	10
10	I find that I am restricted when completing assessments at the computer	4	74	5	8	6

Response patterns here reveal some key insights, with considerable implications for future assessment in Pakistan. Students again express their preference for writing (not ticking boxes) in assessment but seems to doubt that this is possible using computers. Indeed, recent advances in the technologies have shown that written assessments can be computer marked with high levels of reliability (Quality in Higher Education, 2010). There is a division of view about having regular small assessments rather than one assessment but this may simply reflect their experiences of stress caused by assessment. These pinpoint to the need for a radical re-think of assessment. The respondents are almost certainly still seeing assessment in summative terms, the marks and grades determining success or otherwise. With lack of experience of the formative use of assessment, they cannot see how assessment can be an integral element in all learning, the assessment data being used only to inform, direct, encourage, not to award grades.

The respondents do come to appreciate that the computer does not necessarily restrict assessment formats but, somewhat similar to their views about Excel and PowerPoint, they are not enthusiastic about Word. It is an interesting observation that, despite better and easier-to-use alternatives being readily available (often free), these computer packages dominate in Pakistan. While there is a strong view that computer assessments will be fairer, there is also a strong fear that using the computer will prove restrictive. Thus, there is a need to consider very carefully how assessment will be developed, the format that will be used and the essential need to employ software that is easy to use, is straightforward and that generates freedom and confidence.

Table 4
Difficulties in using Computer Applications

	Items	SA	A	N	D	SD
	N = 500	%	%	%	%	%
1	I learn a new computer application very rapidly	22	32	11	11	20
2	Learning at the computer makes learning harder for me	55	26	5	4	7
3	I use a computer to write my assignments	75	8	4	3	7
4	I am not a confident computer user	72	6	4	8	8
5	I need training and help in using a computer	70	6	5	11	5
6	I like the freedom the computer gives to me	71	6	6	8	6
7	The computer restricts my freedom	70	11	5	5	6
8	Computer assessment can test few skills	71	10	2	7	7
9	I prefer the computer to mark my assessments	50	15	12	12	9
10	The computer cannot give me good feedback	49	10	13	16	9

This section identifies some key areas of perceived need. While they use computers for assessments (word processing essays), responses are somewhat confused. Thus, while they like the freedom the computer brings, they find the computer restricts their freedom. They are simply not convinced that computers can test a variety of skills, or that they can give good feedback, but see the value of computer marking (probably fairer). However, the key message is that respondents do not feel confident in using computers. This may reflect lack of access or it may reflect the complex quality and unfriendly nature of the software that tends to dominate the market. There are two clear messages here:

- Training is greatly needed
- There is a need for a radical re-think of the software to be used.

The final section offered eight ways by which computers might be able to help in formative assessment and respondents were asked to tick the three they considered ***most important***.

Table 5
Most important aspects in using computer applications in formative assessment

N = 500	Yes
Ways computers might help in formative assessment	%
Allows a wider range of skills to be assessed	44
Offers regular feedback on my progress	82
Gives more opportunities to demonstrate my abilities	58
Reduces the dependence on memorisation and recall	55
Makes me up to date	43
Makes my work quicker	61
Helps me to work steadily throughout the year	50
Enables me to re-use and refine my work	47

One choice stood out: offering regular feedback on progress (82%). This reflects the difficulties students often experience in being able to gauge whether their work is going to meet the standards required. By the time they face an end-of-course examination, it may be too late to change. Three other options also received more than 50% of the choices. It seems that students are expressing a desire for freedom and the reduction in the memorization straight jacket. The natural way of learning is that learners are seeking to make sense of the world around them (Wadsworth, 2004) and not recall memorized information.

Gender Differences explored from the data

This study also seeks the gender difference in perceiving the role of computers in formative assessment at post graduate level. The chi square analysis helps in exploring the difference between opinions of male and female students. The chi-square test compares two sets of frequencies to see if they are statistically different or any perceived differences have just arisen by chance. There are two ways of undertaking this test:

(a) ***Goodness-of-fit***: here an experimental distribution is compared to a control distribution.

(b) ***Contingency test***: here two distributions are compared where neither can be seen as a control group

In this case, any comparison between men and women must employ chi-square as a contingency test as neither group is a control group.

The chi-square test makes no assumptions about distributions and is designed to handle frequency data. It can handle comparisons between groups of very different sizes. It is one of a group of non-parametric tests. It is, therefore, appropriate for the data in this study. However, there are restrictions on its use. There are limits to the numbers that select any category. Typically, a limit of a minimum of 5% or 10 in every option is needed and grouping of adjacent categories is sometimes needed to ensure that this criterion is met. Only the items where significant differences are observed are shown.

Of the 25 statements, 13 show significant gender differences (shown in table 6).

Table 6

Gender Differences in the Preference of Using Computer

Name of Items	Gender	SD	D	N	A	SA	χ^2	df	P
When needing information, I turn to the internet frequently.	*Female*	46	61	29	47	115	13.4	4	p< 0.01
	Male	20	32	9	46	93			
I find the computer assists my learning greatly.	*Female*	40	33	51	63	113	9.9	4	p< 0.05
	Male	16	18	22	54	90			
I find a word processor very helpful to me in my work.	*Female*	76	39	6	66	113	14.4	4	p< 0.01
	Male	31	15	9	56	89			
I like to do web searching on a computer.	*Female*	66	41	15	72	105	9.8	3	p< 0.05
	Male	33	8	14	60	85			
I think that all assessment could be conducted on computers or iPads.	*Female*	50	85	23	31	107	13.9	4	p< 0.01
	Male	25	85	11	22	57			
I find it easy to do academic work on a computer.	*Female*	40	50	5	57	148	11.9	4	p< 0.05
	Male	20	35	7	60	78			
Computers will give very accurate assessments.	*Female*	15	40	8	54	183	9.8	3	p< 0.05
	Male	14	11	11	25	139			
I need training in how to use computers to assess.	*Female*	13	23	17	65	182	11.9	4	p< 0.05
	Male	21	21	15	37	105			
Computers would make all assessments become like multiple choice.	*Female*	23	32	39	61	145	16.8	4	p< 0.01
	Male	13	13	23	73	78			
I think I collect information easier by using the internet.	*Female*	27	24	24	83	142	8.9	3	p< 0.05
	Male	19	7	11	76	87			
I learn a new computer application very rapidly.	*Female*	72	38	46	103	39	45.2	35	p< 0.001
	Male	30	20	12	62	76			
I like the freedom the computer gives to me.	*Female*	28	28	15	15	214	11.4	2	p< 0.01
	Male	4	15	16	18	147			
I prefer the computer to mark my assessments.	*Female*	32	58	39	45	126	35.8	3	p< 0.001
	Male	13	5	23	32	127			

Men are more disposed to the mechanical aspects of life than women. The most views are tending to be polarized: most hold ether positive or negative views, rarely neutral.

In many questions, men hold more positive views. However, of particular importance in relation to assessment, women fear that computer use would make multiple choice questions dominate. The research evidence about such questions reveals very clearly that multiple choice is a highly flawed way to test (Friel and Johnstone, 1978a, b; 1979a, b). Perhaps, women are more alert to the limitations of this type of assessment. Interestingly, men are much more willing to see computerized marking.Women turn to the internet frequently when need information. Similarly, women find the computer assists my learning greatly. Women tend to find a word processor very helpful to me in my work. Women like to do web searching on a computer. Women are of high belief that the assessment could be conducted on computers or iPads. Women feel it more easy to do academic work on a computer. Women are assuring of computers will give very accurate assessments. I need training in how to use computers to assess. Computers would make all assessments become like multiple choice. Women think collect information easier by using the internet. I learn a new computer application very rapidly. Also more women prefer the computer to mark my assessments.

Table 7

Gender Differences Regarding Difficulties in Using Computer

Name of Items	Gender	SD	D	N	A	SA	χ^2	df	p
I prefer reading a book than learning from a computer.	Female	57	55	13	70	105	13.9	4	p< 0.01
	Male	32	15	7	57	85			
I need training in how to use computers to assess.	*Female*	13	23	17	65	182	10.4	4	p< 0.05
	Male	21	21	15	37	105			
The problem is assessment using computers is my lack of computer confidence.	*Female*	28	31	3	54	182	14.2	3	p< 0.01
	Male	33	23	16	27	101			
I prefer to write by hand in assessment tasks.	*Female*	18	31	47	61	143	22.7	4	p< 0.001
	Male	21	32	13	61	73			
I prefer formal written assignments.	*Female*	42	28	29	93	108	10.5	4	p< 0.05
	Male	20	25	16	85	54			
Computers restrict the formats of assessment that can be used.	*Female*	53	76	77	89	5	10.3	3	p< 0.05
	Male	39	37	37	87	0			
I am not a confident computer user.	*Female*	33	28	15	13	211	10.2	3	p< 0.05
	Ale	8	13	6	19	154			
I need training and help in using a computer.	*Female*	25	32	21	12	210	10.4	3	p< 0.05
	Male	4	24	7	19	146			
The computer restricts my freedom.	*Female*	27	17	17	27	212	8.3	3	p< 0.05
	Male	6	11	8	30	145			
The computer cannot give me good feedback.	*Female*	30	66	45	33	126	24.2	4	p< 0.001
	Male	16	18	23	18	125			

Unsurprisingly, women prefer to write by hand and men are more convinced that computers cannot provide good feedback. Both reflect the natural differences between men and women in relation to mechanical equipment. Women are more open to learning from a computer rather than a book while women show less confidence is using a computer for assessment.

Findings from the Interview Data

This research has recognised that a major aspect of students' perception of the role of computer based application on formative assessment is something which can elaborate upon such influences. It has been noticed that the frequency of published qualitative research studies is however comparatively lower than quantitative research in Pakistan (Ahmed, 2012). Accordingly, use of the qualitative approaches like interview, focus groups and observations are less common. Therefore, this study contributes into research on assessment, particularly using computer based application in formative assessment in Pakistan, used the qualitative approaches such as semi-structured interviews to research the perceptions of students at post graduate level.

Sample of postgraduate students were drawn from the university, mainly from three departments: Education, Business and Sciences, all studying under the semester system. The sample was selected by convenience sampling technique because of the allocation of the students in their departments and specified time of meeting with them. The interviews were conducted in this study with 20 students from different department of social sciences and sciences.

Department	Number of participants
Science	10
Business	5
Education	5

Table Interview Sample

The table shows that the range of students aged between 20-30 covers different departments. Sample of postgraduate students were drawn from the university, mainly from three departments: Education, Business and Sciences, all studying under the semester system. The sample was selected by convenience sampling technique because of the allocation of the students in their departments and specified time of meeting with them.

For ethical consideration, the principals of the departments were informed of the procedure of this research. They agreed to allow this research with their students. Some aspects during field study were considered by the researcher as: firstly, students may not wish to reveal the information or they might think that they will not benefit from responding perhaps even be penalized by giving their real opinion. Therefore, before conducting the research, postgraduate students as target sample were informed of the purpose of the research, as well as they were informed about their rights in terms of voluntary participation. The students were given time to read, re-read the items in the questionnaire and query and ask if they had any question about any aspect of this research.

The common themes were emerged from the interviews with the 20 selected students. The study aimed to explore the recognition of the importance of computer applications on formative assessment, with particular importance given to formative assessment in the classroom at post-graduate level, difficulties using computers and issues with feedback on students work and highlight the gender differences if there are any.

The interview transcripts were read and re-read and the themes were emerged to analyse data. Many issues arose in the interviews but two occurred repeatedly:

- The role of computer in formative assessment
- Difficulties using computer-based applications

The role of computer in formative Assessment

Although a large majority considered that the computer is very helpful in formative assessment strategies, in the interviews, the focus was on the measuring of learning rather than more formative approaches. Some examples of quotes are given as:

One student stated:

> *Using technology, teachers can prepare their students for a future flooded with gadgets including tablets, mobile phones, computers, and so much more (S1).*

One said about the role of technology in developing learning and teaching process:

> *New and emerging technologies challenge the traditional process of teaching and learning, and the way education is managed (S3).*

Students suggested how computer applications can be used: *A student can perform variety of tasks with a computer like drawing pictures, writing stories, writing essays and learn many more things. Information technology prepares a student in academics at different levels (S8).*

> *One advantage is their time saving. It is much quicker to type a letter than to write one with a pen. The connection to the internet is of great use (S18).*

Also, one said:*Using computer and internet helps teachers set test papers, frame questions for home assignments and decide project topics (S11).*

Another stated: Students become able to find out relevant material or read needful contents, Information collection by a computer claims these basic skills, then computer helps in formatting, editing texts, pasting or cutting, providing a wide range of text styles with different fonts in word processing programs (S12).

Moreover, the uses of computer applications are appreciated in research: I have to analyze the data and to write thesis then I should have the knowledge of different type of computer software's like SPSS, NviVo, word, Reference manager. For example when data is quantitative then we have to use SPSS software for data analysis. It could make me successful researcher I have to learn the use of computer software's before to start the research study (S12).

Overall, the students said almost nothing about formative assessment. Their views about new technologies were positive but their range of experiences was clearly limited.

Difficulties using computer based applications

In looking at difficulties using computer based applications around formative assessment, the following issues were raised: time management, over-large classes, workload, student conceptions, and academic regulations. For example: All the computer software and equipment are not reliable and all the results from computer applications can go wrong (S1).

Another said about use of social media websites that take too much time from students as said: *Students were likely to be affected by social media. In Pakistan, students spend too much time on social networking sites through internet which lead to decrease in students' academic performance (S3).*

Another described about the issue of time as:*A lot of time is wasted in getting information from different websites or locations have to be searched out. Students waste their precious time in surfing, chatting or seeing social sites in spite of searching academic materials (S9).*

Another said that: *Few people know that how to fix the computer or get repaired. Our growing dependence on computers is a major concern (S11).*

The interview data indicates that the students perceived the difficulties in using a computer, though they still appreciate the use of a computer particularly in their daily assessment and assignment work.

Discussion and Recommendations

From questionnaires and interviews, it is clear that the nature of formative assessment is not really understood. It seems to be seen as assessment during a course rather than end-of-course assessment. They do not appreciate that formative assessment is assessment to inform learning and NOT to be used for awarding grades or scores. In addition, the students have experienced a very limited range of assessment formats. And a result, they have difficult conceptualizing the power of the computer in assessment. They tended to see the benefits arising from computers very much in terms of being a tool to assist in test-paper setting, internet usage, research as well as a way to write essays and dissertations. They seem to see multiple choices testing as the only format for computer use and this does not appeal, especially to the women. Being unaware of the wide range of computer managed assessment formats, they also seem unconvinced that computers can actually test a range of skills beyond recall.

The other aspect that comes through clearly is that the technology itself is seen as inadequate. This is seen in three ways:

(1) Access to computers as and when needed
(2) The lack of reliability of the computers provided
(3) The quality and lack of friendliness of software being used

These are all policy decisions and need addressed urgently.

Khurshid (2012) revealed that teachers are enthusiastic to employ new technologies. Keeping in view the positional of using computer, the curricula need to be re-designed to build in formative assessment possibilities, using assessment data to identify strengths and weaknesses, and direct future learning. Courses also need adjusting to exploit new technologies much more. In this, students can be given tasks where interaction and experience with the new technologies will assist while the assessment aims can be changed to minimize the dependence on recall skills and give credit for a wide range of skills including: understanding, evidence of critical thinking skills, ability to search the internet with abilities to evaluate what is found, skills of analysis and ability to apply ideas in novel situations. University teachers need support and given the time and resources to develop better ways for the future. However, much cannot be implemented by the teachers unless reliable hardware and friendly software is installed in accessible ways. The current technologies are clearly hindering progress. Teachers and students must have confidence in reliability, easy access and user-friendliness. Without these, progress will not happen.

These findings are summarized below in figure 2. The following flow chart is generated based on the fimdings of this study.

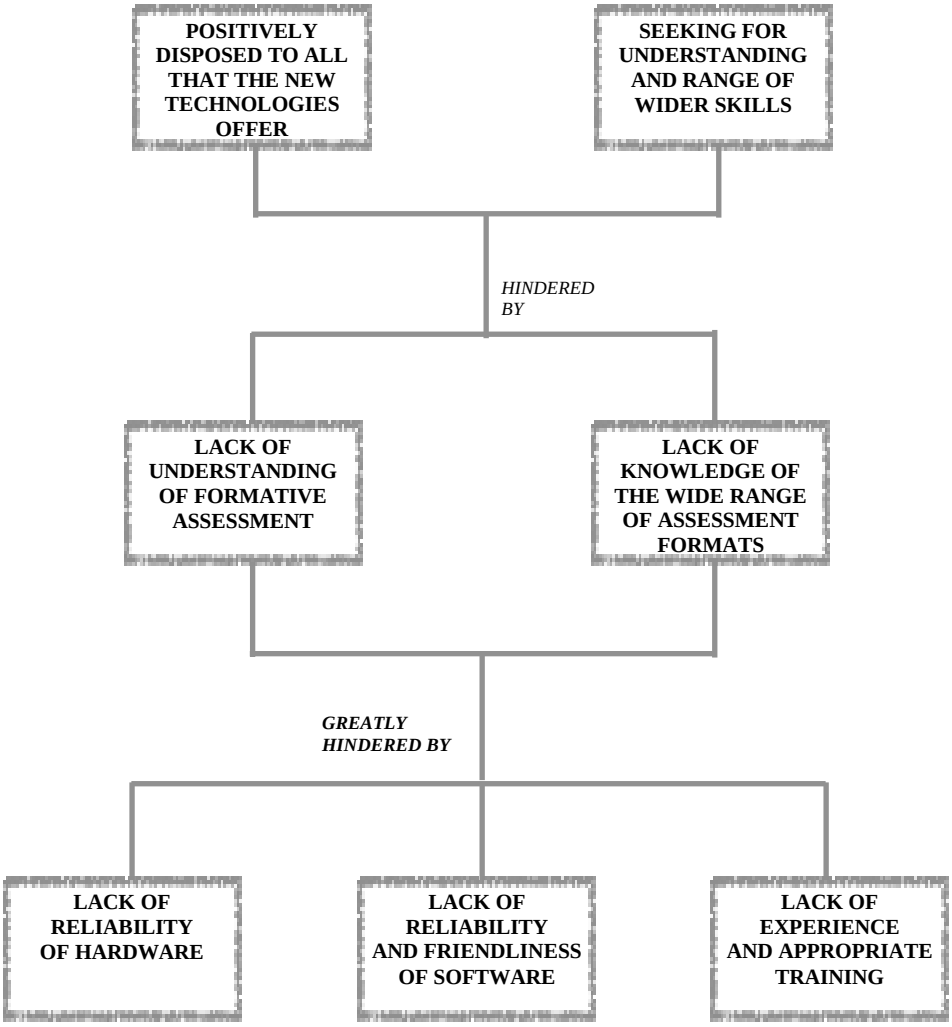

Figure 2 Summary Flow Diagram

This provides an agenda for future action. However, few more difficulties in using computer based applications are much dependency on policy decision relating to provision of equipment, software to be used and access to resources. Two other aspects stand out: education courses need to offer good teaching about formative assessment, what it is and how it can be developed. There is currently confusion, with formative assessment being seen as assessment during a course rather than assessment to inform learning. There is also a great need to widen the range of assessment formats employed and for education courses to offer teaching on these (Ud-Din, 2015).Though, the study was delimited to the post graduate students at universities. Also the study focuses on the use of formative assessment not entirely all components of assessments.

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