

Teachers Perceptions and Needs towards the Use of E-Learning in Teaching of Physics at Secondary Level

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Abstract The modern technologies particularly the internet and social media, made education no longer limited in the boundaries classroom. Measuring attitudes, perceptions and efforts to improve attitudes towards technology got pivotal importance to effect any change through technology. The study focused towards the perception and needs of the teachers of physics for the use of technology for teaching learning process. Pedagogical aspects, performance expectancy, facilitation conditions, behavioural intentions and social influence were the key dimensions on the basis of which the initial pool of items were written, validated and pilot tested for the questionnaire of teachers. The participant teachers' responses were analysed and interpreted according to the gender and duration of their weekly internet usage. The empirical results indicated that teachers showed great readiness and positive intention towards the use of technology. Statistical analysis of the results of the study indicates that students believe that technology is more effective than the traditional mode of physics teaching. They also indicate that students were more receptive to the learning material in the form of an e-learning than a traditional lecture or textbook. The study suggests that the use of internet as a tool has clear benefits as perceived by secondary school students in terms of the time they take to revise and how much they feel they can learn. The findings of this study provides on-line professional guidelines for e-learning system to be designed effectively to improve students and teachers interest and motivation in the learning environment.

Keywords: *perception, teaching of physics, technology adoption, paradigm shift*

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1. Introduction

Teaching Learning process is complex in nature and can take variety of forms. Traditional education is bounded by age, time, space, money and area. Physical presence of a student and teacher is mandatory for the whole time of study. Traditional education provides interactive relationship between student and teacher and among the students; this interaction promotes better understanding of the contents and opportunities to learning with peers. However in some cases physical proximity of learner and teacher is not possible for example a person with responsibilities may find it hard to attend the classes regularly. To provide the students with opportunities to learn in a flexible and easy way, the concept of Distance Learning (DL) was introduced. The original concept of teaching from a distance dates back to 1840's, however, it was not for a complete program. Since times Distance Learning is evolving and has attracted masses for perusing studies. The most advanced generation of DL is e-Learning, which is Computer and Web Based learning. Advancement in technology has compelled teachers and educators to get benefit of it for the delivery of instructions and for promoting learning.

Electronic learning has been advanced as a mode of distance learning, the most known characteristic of electronic learning is use of electronic machines and media to facilitate learning. Electronic learning is also known for its capacity to make teaching learning process possible even when a substantial amount of the instruction is offered by somebody far-flung from the student [10]. Perraton has described it as open learning, categorized by independent learning that is elastic in nature. In this sort of learning there is no need for learners to be present at a traditional educational institution or to be focused to continuous observations by instructors. Consequently, electronic learning can be used as an intermediate mode between customary teacher-centered learning and student-centered learning.

The rapid development of information, communication and technologies (ICT) has initiated unparalleled transformation in all fields of life throughout the globe, including education sector. Its ability to provide access to a means of resources and new forms of communications has opened new horizons of education. Through ICT all time and all place learning dream has become a reality. Teachers and students both are making use of ICT to ensure effective learning takes place both inside and outside the classrooms. Technologies do have great potential benefits to offer to educational process however

this is a complex multi-faceted arena. It is a fact that there is now a variety of digital resources and information and communication technology (ICT) tools to support learning and teaching. In the last decades we have seen a shift in learning paradigms and now the focus has been shifted from information to an emphasis on communication and understanding. Development of understanding and ability to apply the knowledge are considered to be more critical as compared to having factual knowledge and for this purpose, delivery of content alone does not lead to effective learning. Technology support is seen as a solution to the problem of overemphasis on content.

No educational institution of today can survive without getting help from technology. Technology now has a significant impact on educational institutions, changing both organizational structures and individual functions (administrative, teaching and learning). The variety and complexity of new technologies and the potential ways in which they can be used for educational purposes is not a simple phenomenon. In Academia variety of technological tools and the multiple ways to use them has proved to be challenging for both the administrative staff and instructors. This dilemma is even more alarming when electronic learning is used as internet based learning. As we have entered in the third millennium education via internet, intranet or network represents great and exciting opportunities for both educators and learners. Educators have seen the rapid development of computer networks and improvement in the processing power of personal computers. The internet and World Wide Web have made the computer a dynamic source in education, providing a new and interactive means of overcoming time and distance to reach learners [15].

E-learning refers to using electronic application and processes to learn. Learning applications and processes including web-based learning, computer based learning, virtual classrooms and digital collaborations are the key elements of e-learning. Content is delivered via the internet, intranet, extranet, satellite, TV, and CD-ROM with multimedia capacities. In modern era e-learning is a generic term for all technologically supported learning using on array of teaching and learning tools as phone bridging, audio and videotapes, teleconferencing, satellite transmissions, and the more recognized web-based training or computer aided instruction also commonly referred to as online course.

Alarifi [1] supports that the potential benefits of e learning are not limited to distance education perspective only. He argues that e-learning can be used as a set of techniques to provide educational content with its explanations and to stimulate trainings and collaboration in school rooms. Self-directed learning is also related with technology as revealed by Holmes and Gardeners [3] who refer e learning as a means to virtual contact between learner and instructors and facilitates learning at any time and place. They argued that E-learning facilitates learning by using microelectronic application and procedures. These presentations and procedures include virtual classrooms and digital collaboration. Content is distributed via the internet, intranet, with multimedia capabilities.

It is recognized that unless the individual factors of teachers and students are considered, potential of e-

learning will not be fully obtained resulting in lowering the return on investment [2]. Hence, it is essential to know the perceptions of the user (teachers and students) as the major factor in any technology-enhanced learning environment. Therefore for effective use of e learning platforms, it is important to consider all the key role players --- students, teachers and institution --- in the implementation of e-learning.

Khan [7] proposed eight dimensions of an effective e learning environment: pedagogical, technological, interface, evaluation, management, resources support, ethical, and institutional. Each dimension has sub-dimensions to cover all specific characteristics of the e-learning environment. ELAM (e-learning acceptance model) classifies the main features in acceptance of e-learning as dignified by behavioral intention for the usage of the knowledge and positive practice of e learning. The factors of e-learning acceptance are (i) performance expectancy, (ii) effort expectancy, (iii) social influence and (iv) facilitating conditions. Performance expectancy is constructed on principles about acknowledged practicality, interaction and flexibility. Social influence is established on independent standards of e-learning environment. Institutions depend on organizational funding to get the set-up and define policies; formal support plays a dynamic part in the implementation of e-learning. Therefore, facilitating conditions may be considered as one of the key determining factors of e-learning acceptance. The subsequent features are incorporated in this adaptable trustworthy infrastructure, official guidelines, coaching and funding.

Venkatesh [14] framed the Unified Theory of Acceptance and Use of Technology (UTAUT), UTUAT is constructed upon the theoretical and perceived relationships among different factors. Acceptance of e-learning comprises acceptance of technology, but varies in some key aspects as the pedagogical aspects need to be measured. Studies of e-learning technological acceptance have considered TAM or UTAUT, and established it on either teachers [2,9] or students [6,8]. These studies offer indication for significance of attitudes in acceptance of e-learning. It is empirically supported that perceived ease of use is the utmost significant factor for instructors, while performance expectancy is the utmost significant factor for learners [5,11].

i. Performance expectancy states that learner have confidence in that by using the system will aid him or her to achieve improvements in performance.

ii. Social influence states that learner recognizes that he or she must use the new system.

iii. Facilitating conditions states that learner has confidence in that a governmental and methodological infrastructure occurs to maintain the system.

iv. Behavioral intention states that learner have choice concerning prospect system.

E-learning dimensions are related with the teaching-learning process. The key impact of this literature is that it presents a frame to understand e-learning acceptance as administered by the teacher, student and institutional factors. ELAM provides perceptions into the particular factors that ease optimal use of e-learning resources by educators and learners. The following figure would help to understand the concept with deeper comprehension.

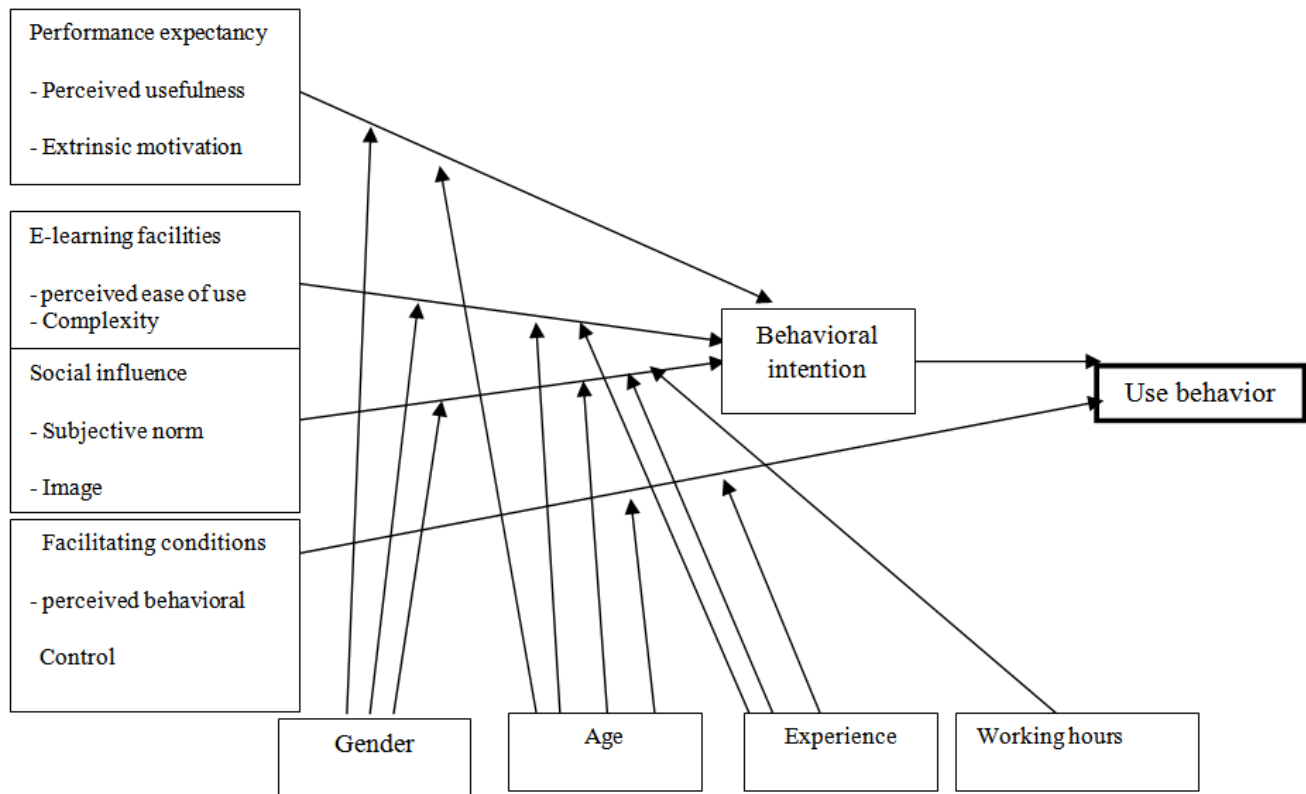


Figure 1. User acceptance of information technology Model (Source: [14])

An empirical test of ELAM model may provide insights into the specific factors that facilitate optimum utilization of e-learning resources by teachers and students. This would help the learners and others interested in use of technology, to understand the critical factors that can hinder the acceptance of e-learning practices by teachers and should be addressed in the implementation process. Thus, the present study contributes to the development of suitable pedagogical methods for e-learning.

Very few attempts have been made so far to explore the attitudes of both students and teachers in the frame of e-learning acceptance in this region of the globe. No research study ever found the teachers perceptions and practices related to e-learning in the subject of physics, in Pakistani Context. The model used in the present study indicates that use of technology is defined by four factors performance expectancy, effort expectancy, social influence and facilitating conditions.

Researchers used these dimensions in order to investigate the use of e-learning at secondary level in teaching and learning physics in both Public and Private sector Schools. In Pakistani context both public and private schools, are focusing the use of technology in teaching learning process. Private schools are essentially affiliated with Boards of secondary and Intermediate Certificates and both perform according to the policies devised or approved by the Ministry of education. For this study purpose both public and private schools were included but the aim was not to check the differences in the perceptions of teachers on the basis of sectors in which they are serving.

The study is the first in its nature and it is not only intended to add to the existing body of knowledge related to e-learning in the subject of physics and in the context of Pakistan, but it was also intended to explore appropriate instructional needs for using e-learning in teaching of

Physics subject at Secondary Level. Therefore, the researchers intended to achieve the following specific objectives:

1. To identify the perceptions of teachers of physics at secondary level towards the use of e-learning techniques.
2. To explore the training needs of teachers for the use of e-learning for teaching of Physics.

2. Procedure of the Study

A survey was conducted with data collected from ICT institutes in urban area of Islamabad. The empirical stage of this study began by identifying relative construct of teachers perception to use e-learning system generated the relative measures as broad as possible. Then researchers developed a tool by using the identified constructs from the literature. To check the face validity of instrument was shared with experts in the field of study and research. Next, the reliability analysis technique was employed to structure and validate the relationships underlying determinants pedagogical aspects, performance expectancy, facilitation conditions, behavioral intentions, social influence and training needs.

The survey questionnaire developed by the researchers consisted of two parts. The first part of consisted of some the demographic variables such as gender, age, experience of learning using social media and social media usage. The second section comprised items to be rated on five point scale (Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree), through which researchers measured the perception of teachers towards the use of e-learning in teaching physics and their training needs. For the development of the instrument initially items were written as per relative constructs identified, after

validation of the drafted instrument was pilot tested and reliability statistics were calculated which was found to be 0.78.

3. Participants

The researchers used cluster sampling technique to select the sample from the population of study comprised teachers of ICT institutions of urban area. There were total 74 schools in which public schools were 36 number of girls school were 21 and boys were 15 and in private sector the total number of schools were 38 in which boys school were 18 and girls school were 21. To select the sample of the study at first stage equal number of boys and girls school were selected from both private and public strata (ten from public and ten from private) by considering the school as a cluster. Four teachers from each selected Cluster (school) constituted the sample,

comprised eighty teachers teaching physics in Islamabad Capital Territory.

4. Results and Findings

The empirical data collected were analysed by the independent sample t-test, frequency, mean and one sample t-test. The summary of the data and interpretation are given below.

5. Pedagogical Aspects of e-learning

This section reports respondents' answers to the four items related to pedagogical aspects of e-learning. The following Table 1 presents teachers' responses against each statement.

Table 1. SUMMARY OF TEACHERS RESPONSE ON PEDAGOGICAL ASPECTS

S. No.	Statements	Frequency %	SA	A	UND	D	SD	MEAN
1	E-learning facilities provide me opportunities to integrate effective pedagogy.	F %	31 38.8	45 56.2	4 5	-	-	4.34
2	E-learning technology can be used to support and enhance learning	F %	29 36.2	47 58.8	4 5	-	-	4.31
3	E-learning tools enable teachers to make their teaching effective.	F %	29 36.2	46 57.5	3 3.8	2 2.5	-	4.28
4	E-learning made possible different kind of learning styles to be catered.	F %	23 28.8	53 66.2	-	4 5	-	4.19

Analysis to the response the above statements shows highest mean (4.34) for the statement, "E-learning facilities provide me opportunities to integrate effective pedagogy". The lowest mean (4.19) for the statement regarding the alignment of the e-learning with the learning styles of the students. The overall mean score of all the statements is above the scale mean (3) indicating teachers perceived that they were able to access appropriate materials for their own learning.

6. Facilitation Conditions

The second dimension was "Facilitation Conditions", there were nine statements to measure this dimension. The extent of the teachers' perception of facilitation conditions were analyzed using frequency and percentages. The following table summarizes the responses.

Table 2. SUMMARY OF TEACHERS RESPONSES ON FACILITATION CONDITIONS

Sr. No.	Statements	FREQUENCY %	SA	A	UND	D	SD	MEAN
1	E-learning resources are available in the institution.	F %	4 5	20 25.5	19 23.8	23 28.8	14 17.5	2.71
2	My colleagues are not aware of the e- planned course and lessons.	F %	16 20	14 17.5	17 21.2	19 23.8	14 17.5	2.99
3	E-learning assures schedule flexibility.	F %	24 30	25 43.8	13 16.2	6 7.5	2 2.5	3.91
4	I find enough time to develop and redevelop materials.	F %	16 20	23 28.8	15 18.8	20 25	6 7.5	3.29
5	E-learning appears to improve the learning outcomes.	F %	21 26.2	47 58.8	8 10	2 2.5	2 2.5	4.04
6	Integrating e-learning between the different course activities is easier for me.	F %	17 21.2	50 62.5	4 5	9 11.2	-	3.94
7	Course information is well-structured and organize information is available for students.	F %	12 15	48 60	5 6.2	13 16.2	2 2.5	3.69
8	Support mechanisms are not available to development and delivery of e-learning content.	F %	22 27.5	34 42.5	14 17.5	9 11.2	1 1.2	3.84
9	E-learning activities are aligned with courses and activities.	F %	17 21.2	23 28.8	22 27.5	16 20	2 2.5	3.56

The first two statements were rated low as these were about the availability of the resources and awareness of the colleagues about e-learning. On the other hand teachers are more confident about the effectiveness of the e-learning as the mean of the statement "E-learning appears to improve the learning outcomes" is 4.04 which

more than any of the means of the statements about the dimension of facilitation conditions. Teachers agreed with the statements about, flexibility of the schedule, development and redevelopment of the material and easier to integrate e learning activities. The important concern of the teachers' is that so far support mechanism is not available.

7. Performance Expectancy

The third dimension was “Performance Expectancy” ten statements were placed in the questionnaire to measure

this dimension. The extent of the teachers’ perception of Performance Expectancy was analyzed using frequency and percentages. The following table summarizes the responses.

Table 3. SUMMARY OF TEACHERS RESPONSE ON PERFORMANCE EXPETENCY

Sr. No.	Statements	Frequency %	SA	A	UND	D	SD	MEAN
1	I can use video conferencing as a tool for the delivery of e-pedagogy.	F %	10 12.5	41 51.2	5 6.2	16 20	8 10	3.36
2	E-learning tool that allow teachers to interact with students in real time.	F %	12 15	23 41.2	16 20	12 15	7 8.8	3.39
3	E-learning is not efficient as teaching method.	F %	17 21.2	32 40	13 16.2	12 15	6 7.5	3.52
4	E-learning eases the process of learning.	F %	12 15	41 51.2	18 22.5	7 8.8	2 2.5	3.68
5	E-learning enhances students’ performance.	F %	14 17.5	59 73.8	5 6.2	2 2.5	-	4.06
6	I find different e- assessments activities to engage learner in.	F %	13 16.2	54 67.5	10 12.5	3 3.8	-	3.96
7	E-learning content do not accommodate the preference of students and teachers.	F %	-	7 8.8	15 18.8	51 63.8	7 8.8	3.72
8	E-learning enhances students’ interest.	F %	17 21.2	42 52.5	13 16.2	6 7.5	2 2.5	3.82
9	In e-learning choosing topic is not easier for students.	F %	8 10	40 50	11 13.8	15 18.8	6 7.5	3.36
10	E-learning caters with the individual difference.	F %	17 21.2	37 46.2	7 8.8	12 15	7 8.8	3.56

The above table indicated that the mean score of the statement regarding enhancement in students’ performance through e- learning is 4.06 much above the scale mean (3). This shows that most of the respondents agreed with this statement. Whereas responding teachers also agreed with the facts that:

E-learning enhances students’ interest, it eases the process of learning, and it cares the individual differences and similar statements of performance enhancement through e-learning. Teachers were undecided for use of e learning as a tool that allows teachers to interact with students in real time, choosing topic for e learning is not easier for students, and use video conferencing as a tool for the delivery of e-pedagogy.

Teachers expressed a preference for communication by electronic means and agreed that the opportunities were easier and more frequent. The results showed the positive response to the facilities for teachers provided by e-learning.

8. Behavioral Intentions

The dimension of “Behavioral intention” of teachers towards the use of e-learning for teaching of physics at secondary level was addressed by including six statements in the tool. The responses of the teachers are summarized in the [Table 4](#).

Table 4. SUMMARY OF TEACHERS RESPONSE ON BEHAVIOURAL INTENTION

Sr. No.	Statements	FREQUENCY %	S.A	A	UND	D	S.D	MEAN
1	E-learning permits suitable technical support.	F %	5 6.2	25 31.2	12 15	30 37.5	8 10	2.86
2	I feel more freedom learning by e-learning.	F %	18 22.5	34 42.5	-	6 7.5	22 27.5	3.25
3	I am preparing students to working in a group.	F %	15 18.8	25 31.2	15 18.8	23 28.8	2 2.5	3.35
4	E-learning helps me with time management and self-discipline.	F %	23 28.8	40 50	6 7.5	11 13.8	-	3.94
5	E-learning do not increased my communication with other learners.	F %	15 18.8	30 37.5	9 11.2	26 32.5	-	3.42
6	E-learning permits what is suitable for my own learning. Style	F %	16 20	44 55	10 12.5	8 10	2 2.5	3.80

The summary of the statistics highlighted that the teachers agreed that e learning help them in time management and allows them to decide what suits for their own learning enhancement. But they disagree with the suitable technical help is available to them for using e-learning facilities whereas they could not decide about enhancement of useful communication and freedom for learning.

9. Social Influence

The dimension of “Social influence” reports teachers responded to a number of items that were designed to discover the extent of their perception about global move towards the use of e-learning. Their responses are tabulated here and a detailed comparison of their ratings follows:

Table 5. SUMMARY OF TEACHERS RESPONSES ON SOCIAL INFLUENCE

Sr. No.	Statements	FREQUENCY %	S.A	A	UND	D	S.D	MEAN
1	Global move towards e-learning use will compelmne to use this in the classroom.	F %	10 12.5	38 47.5	5 6.2	23 28.8	4 5	3.34
2	My colleagues are using e-learning technology in the classroom.	F %	14 17.5	13 16.2	2 2.5	35 43.8	16 20	2.68
3	I have students pressure to use e-learning technology in teaching.	F %	11 13.8	20 25	8 10	26 32.5	15 18.8	2.82
4	I have head of institution pressure to use e-learning technology.	F %	12 15	41 51.2	2 2.5	14 17.5	11 13.8	3.36
5	Using e-learning technology enables me to compete with other institutions.	F %	21 26.2	31 38.8	18 25.5	7 8.8	3 3.8	3.75

From the Table 5 above the item concerning, “Using e-learning technology enables me to compete with other institutions” was rated high with mean of 3.75 (agree) whereas the mean score for the item “I have head of institution pressure to use e-learning technology” was 3.36 slightly inclined towards the agreement. The responding teachers remained undecided about the global influence towards e-learning usage in the classroom and pressure from the students to use e-learning facilities. They also don’t have any fear or peer pressure to use e-learning for teaching of physics. Therefore, from the above survey it is

concluded that global shift towards e-learning presents a suitable support to the learner.

10. Training Needs

Another dimension of training needs of the teachers was also included in the final tool administered to the teachers of physics at secondary level. The purpose was to identify the training needs. The responses of the teachers are summarized below.

Table 6. SUMMARY OF TEACHERS RESPONSE ON TRAINING NEEDS

Sr. No.	Statements	FREQUENCY %	S.A	A	UND	D	S.D	MEAN
1	Our institutions are enabling teachers to become effective user of e-learning technology.	F %	12 15	29 36.2	8 10	19 23.8	12 15	3.12
2	Training is essential to become efficient user of technology.	F %	30 37.5	27 33.8	6 7.5	9 11.2	8 10	3.78

The teachers agreed that training is essential component for the delivery of the instruction through e-learning and are willing & motivated to receive such trainings. But they were not clear that whether our institutions are enabling teachers to become effective user of e-learning technology.

11. Comparison of Perception of Physics Teachers towards the Use of e-learning across Gender

Whether the teachers have positive perception towards the use of e-learning for teaching physics, was answered by testing the hypothesis stating no difference between perception of male and female physics teachers. T-statistics of male and female teachers is presented in the Table 7 below.

Table 7. SUMMARY OF COMPARISION PERCEPTION OF TEACHERS

GENDER	N	MEAN	SD	t-value	Sig
Male	40	8.21	.181	.496	.988
Female	40	8.11			

T-statistics provides evidence that there was no significant difference among the mean value of male (8.22) and female teachers (8.21).from the above table the t-value (.496) with at 0.05 level of confidence. It can be concluded that both male and female teachers have positive same perception towards the use of e-learning.

12. Conclusions

In order to build up a comprehensive theoretical foundation and to realize the mechanism for e-learning environments, the present study was motivated by a broad interest in understanding teacher’s perception towards the use of ICT in teaching of Physics. This study may help practitioners and researchers in having better comprehensions on how teachers will respond to social media and increased user acceptance by improving the techniques and processes by which they are implemented. The major implications of this study are illustrated as follows:

1. Our results demonstrated the constructs of pedagogical aspects, performance expectancy, facilitation conditions, behavioral intentions, social influence and training needs, as pre requisites for effective use of ICT for teaching of Physics.
2. Training in the use of computers to take full advantage of all e-learning’s features at secondary level must be ensured as trained teacher will be able to maximize the benefits of E learning for the students learning.
3. Teachers believed in the capacity of e-learning to make knowledge more readily available in multiple formats and from a variety of sources to suit every style of learning in learning at secondary level.
4. E-learning was found to be economic and efficient at secondary level.

5. E-learning provides design and produce quality of educational content in learning at secondary level.
6. An introductory training plan should be there that would help the teachers in getting started. The program should include; introduction to computers, introduction to the LMS, basic email etiquettes, familiarization with basic software's and introductory courses of mathematics and English. These courses may be used for teachers and will help them to get familiar with the whole IT based system.

To sum up this study aimed to enrich understanding of behavioral intention of teachers towards e-learning usage at secondary level for the subject of Physics. The study opens new doors for an improved ICT based education model and hopes to count towards better comprehension of students and more effective teaching of physics at secondary level in Pakistan.

References

- [1] Alarifi, Y. (2003). E-learning Technology: Promising Method, E-learning International Conference, Saudi Arabia 23-25/3/2003, Riyadh: King Faisal School.
- [2] Allan H. K. Yuena, Will W. K. Ma. (2008). Exploring teacher acceptance of e-learning technology, The University of Hong Kong.
- [3] Holmes, B. and Gardner, J. (2006). E-Learning: Concepts and Practice, London: SAGE Publications.
- [4] Jenkins, M. & Hanson, J. (2003). E-learning Series: A Guide for Senior Managers, Learning and Teaching Support Network (LSTN) Generic Centre, United Kingdom.
- [5] Jung, M.L., Loria, K. Mostaghel, R. and Saha, P. (2008). E-Learning: Investigating University Student's Acceptance of Technology, European Journal of Open, Distance and e-learning [online], http://www.eurodl.org/materials/contrib/2008/Jung_Loria_Mostaghel_Saha.htm
- [6] Keller, C. Hrastinski, S. and Carlsson, S.A. (2008). Students' Acceptance of E-Learning Environments: A Comparative Study In Sweden and Lithuania, [online] In Proceedings of the Fifteenth European Conference on Information Systems (Österle H, Schelp J & Winter R. Eds.), pp. 395-406,
- [7] Khan, B. H. (2005). Managing E-learning: Design, Delivery, Implementation and Evaluation, Hershey, PA: Information Science Publishing.
- [8] Masrom, M. (2007). Technology Acceptance Model and E-learning, 12th International Conference on Education, Sultan Hassanol Bolkiah Institute of Education, Brunei Darussalam, pp 21-24.
- [9] Nanayakkara, C. (2007). A Model of User Acceptance of Learning Management Systems: a study within Tertiary Institutions in New Zealand, [online] presented at EduCause Australasia, http://www.caudit.edu.au/educauseaustralasia07/authors_papers/Nanayakkara-361.pdf.
- [10] Perraton, H., Creed, C., & Robinson, B. (2002). Teacher education guidelines: Using open and distance learning. UNESCO.
- [11] Raaij, E.M. and Schepers, J. J.L. (2008). The Acceptance and Use of a Virtual Learning Environment in China, Computers & Education, Vol. 50, pp 838-852.
- [12] Rossiter J. (2002). An e- learning vision: towards Pan Canadian Strategy and action plan. Discussion paper.ottawa; ON: CANARIE.
- [13] Smith B, Reed P & Jones C. (2008). Mode Neutral' pedagogy. European Journal of Open, Distance and E-learning.
- [14] Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View, MIS Quarterly, Vol. 27, No. 3, pp 425-478.
- [15] Wagschal, P. H. (1998). Distance education comes to the academy: But are we asking the right question? The Internet and Higher Education, 1, 125-129.