# A Comparative Study of the Usage of Open Educational Resources in the E-Learning Universities and Conventional Universities of Pakistan

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**Abstract**

The purpose of this study is to find and compare the extent of use of Open Educational Resources (OER), the factors that affect the use of OER and perceptions about the use of OER of teachers of the E-learning Universities and Conventional (Face To Face teaching) Universities of Pakistan. For our study purpose we have included Virtual University as E-learning University and Minhaj University Lahore as conventional university of Pakistan. The data is collected from a sample of 30 respondents from each university using the questionnaire method. Results of the data indicate that teachers have expert technological skills and they use digital and OER resources more in VU than Minhaj University. The teachers of VU also show more positive perceptions about the use of different OER with the lectures as supporting material than the Minhaj University.

**Keywords**:  Open educational resources; perceptions, OER; questionnaire.

**Introduction**

Open Educational Resources (OER) are teaching and learning materials that are freely available online for everyone to use, whether you are an instructor, student or self-learner. Examples of OER include: full courses, course modules, syllabi, lectures, homework assignments, quizzes, lab and classroom activities, pedagogical materials, games, simulations, and many more resources contained in digital media collections from around the world.

Open Education Resources (OERs) are now being developed all over the world and member countries of Open Ware Consortium include countries from around the globe. The use of OERs by students and teachers is increasing which is spreading the idea of OER and is also leading to an increase in the number of available resources. Developing countries face multifarious problems in education and hence OERs are seen as a panacea to improve quality, reduce cost and increase access to education resources (Geith & Vignare, 2008; Hatakka & Mozelius, 2009; Pagram & Pagram, 2006). This study will focus on open content of OERs and not on open software and tools.

OER is defined by UNESCO (2002) as resources "enabled by the information and communication technologies, for consultation, use and adoption by a community of users for noncommercial purposes". According to Bissell, OERs are "digitized materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning and research" (2009, p. 97). The biggest contribution to OER has been made by MOOCS that contributed approximately 2200 courses for learners and teachers (Atkins, Brown& Hammond 2007). Other initiatives such as China Open Courseware and NPC are also contributing in open courses (Dhanarajan & Porter, 2013).

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In OER courses, the learners take advantage of quality and flexibility of resources "enhanced opportunities for learning; support for learner-centered, self-directed, peer-to-peer and social/informal learning approaches" (Journeys to Open Educational Practice). According to the Economic Survey of Pakistan 2002, the causes of poor education in Pakistan are defective curricula, dual medium of instruction at secondary level, poor quality of teachers, cheating in the examinations and overcrowded classrooms. Memon (2007) commenting on the appointment of teachers elaborates that the quality of teachers is poor in Pakistan and the main reason is the low educational qualification of primary teachers. The educational qualification of a primary school teacher is ten years of education and an eleven-month certification program. The other two reasons given by Memon (2007) are quality of teacher certification programs and interference from local groups in the appointment of teachers.

Open education resources are made freely available over the internet and can be used by teachers, institutions or by students. OERs may include lecture material, readings and reference notes, simulations, experiments and demonstrations as well as curricula and teacher guides (UNESCO 2002). It is the result of international effort to enable access to educational resources throughout the world (Bissell, 2009). On the advantages of OER is to enable access to "nontraditional group of students and those from disadvantaged backgrounds, resulting in the widening in participation" (Harsasi 2015, pg75). The biggest benefit of OER for developing countries is their new approach in sharing of knowledge that can lead to economic success for individuals and also for entire countries (McDowell, 2010).

Littlejohn et al. (2008) states that whilst purely informational content has a significant role in learning and teaching, it is helpful to consider learning resources by their levels of granularity and to focus on the degree to which information content is embedded within a learning activity:

- Digital assets – normally a single file (e.g. an image, video or audio clip), sometimes called a 'raw media asset';
- Information objects – a structured aggregation of digital assets, designed purely to present information;
- Learning objects – an aggregation of one or more digital assets which represents an educationally meaningful stand-alone unit;
- Learning activities – tasks involving interactions with information to attain a specific learning outcome;
- Learning design – structured sequences of information and activities to promote learning.

OERs include a range of learning material hence it is difficult to generalize the impact of one particular OER to all similar OERS. The performance of 690 students using open textbooks in a psychology introductory class was compared with 370 students who had studied from the traditional textbook. Hilton and Laman (2012) found that students who used open textbooks scored better grades and their withdrawal rate was also lower than other students. Robinson, Fischer, Wiley and Hilton (2014) conducted a study with 4183 science students in Utah district and compared the science criterion referenced test scores of students who used textbooks and students who used traditional books. The results of the study indicated that students who used open textbooks scored better than students who used traditional books. In higher educational institutions, a study was done by Bliss et al. (2013) in eight colleges and the study involved fifty eight teachers and 490 students who filled a survey to share their experience of using OER textbooks. The results of the study showed that 50% said that the OER textbooks were of the similar quality as traditional books and 40% reported that OER books were of better quality. In open ended comments, cost saving was mentioned as the major reason for using OERs by

students. 55% of teachers reported that open textbooks were of the same quality as traditional books and 35% felt that they were of better quality.

It is important to see the impact of OER on student learning as reduced cost with a decrease in student learning outcomes would not favor adoption of OER materials. A study done by Lovett et al. (2008) compared the learning of students enrolled in OER statistics course with students enrolled in traditional course at Carnegie Mellon University. Students who agreed to participate in the study were randomly assigned to control and experimental groups and their scores were compared at the end. In both the semesters, the results of the students on three midterms and one final showed that there was no difference in the scores of students in the two groups.

In another study on the use of OER, Bowen et al. (2014) did a comparison of the students' performance taught by using a traditional book in a face-to-face class with another groups of students who were taught with a blended learning approach using OERs. In the blended learning approach there were 605 students while the face-to-face class had 2439 students. Students who used blended learning approach using OERs scored slightly higher than the students taught through traditional method but there was no significant difference in scores of the two groups.

The benefits of different types of OER on students in developing countries may be different due to the difference in textbooks, teaching quality, examination system and pedagogical approaches. Students in developing countries may face more barriers than students in developed countries where most of the OER content is being developed and where there are less technological and infrastructure constraints. In order to make OERs accessible to students in developing countries as "education is a right rather than a privilege" (Larson and Murray), studies need to be conducted on the use of OER by students in developing countries so that specific barriers can be identified and strategies can be designed to maximize use.

This study is designed to find and compare the extent of use of Open Educational Resources (OER), the factors that affect the use of OER and perceptions about the use of OER of teachers of the E-learning Universities and Conventional (Face To Face teaching) Universities of Pakistan. For our study purpose we have included Virtual University as E-learning University and Lahore Minhaj University as conventional university of Pakistan. The data is collected from a sample of 30 respondents from each university using the questionnaire method. Results of the data indicate that teachers have expert technological skills and they use digital and OER resources more in VU than Minhaj University Lahore. The teachers of VU also show more positive perceptions about the use of different OER with the lectures as supporting material than the Minhaj University Lahore.

## Research Objectives
1. To identify and compare the extent of use of OER by Virtual University (VU) teachers and Minhaj University (MU) teacher.
2. To identify the major factors that affects the use of OER by Virtual University teachers and Minhaj University (MU) teachers.

## Research Questions
The research questions for this study are:
1. What is the extent of use of OER by Virtual University Teachers and Minhaj University Teachers?

2. What are the major factors that affect the use of OER by Virtual University Teachers and Minhaj University teachers?

## Materials and Methods

### Development of Questionnaire

In this study, data is collected from the sample of 30 respondents of the Virtual university (VU) teachers and30 respondents ofMinhaj University teachers. The sample is selected using Simple Random Sampling technique. The data is collected from questionnaire which is developed by reviewing the questions developed by OER Asia Study. The pilot study is done conducted and some changes were incorporated in the questionnaires. Validity of the questionnaires was established statistically. The key concepts being addressed in the questionnaire of Teachers are: Use of OER; Factors enabling and inhibiting OER use; Impact of OER use on student learning.

### Sampled Population

The population consists of 300 teachers of the Virtual University campuses of Lahore and 270 Minhaj University Lahore teachers. A sample of 30 teachers is selected at random using Simple random sampling technique from each university. The data is collected using the questionnaire method.

The sampling plan used in this study is two stage stratified simple random sampling. On the first-stage the universities are selected based on stratification using conventional and e-learning education system as stratification attribute. Then the sample of 30 teachers is selected from each sampled university at second stage. An equal sample of size 30 is selected from each selected university.

### Results and Discussion

From the 30 VU teachers surveyed, 40% were male and 60% were female. In the beginning of the questionnaire teachers were asked about their proficiency and use of different digital resources such as using computer, tablet, smart phone, scanner, printer, email, different software programs and editing tools. The results indicate that 100% of the teachers can use computers, smart phones and tablets efficiently and independently. Almost half of the teachers could use scanner, editing tools, multimedia projector and printer. The digital and resources most frequently used by teachers are e-books, tutorials, slide presentations, online quizzes, videos, simulations and audios.

Table 1 & 2 show the perceptions of VU teachers about the different uses of Open Educational Resources.

**Table No. 1** *General Perceptions of Virtual University Teachers about Benefits of OERsUsage (%)*

| Perceptions about Benefits of OERs Usage | Very Important | Important | Moderately Important | Slightly Important | Not Important | Not Applicable |
|---|---|---|---|---|---|---|
| Use of open educational resources gives me access to the best possible Resources. | 45.76 | 30.50 | 8.47 | 1.69 | 3.38 | 10.16 |
| Use of open educational resources promotes scientific research and education as publicly open activities. | 33.89 | 27.11 | 13.55 | 5.084 | 6.77 | 13.55 |
| Use of open educational resources brings down costs for students. | 35.59 | 32.20 | 8.47 | 3.38 | 6.77 | 13.55 |
| Use of open educational resources brings down costs of instructional materials development for VU. | 38.98 | 27.11 | 8.47 | 1.69 | 8.47 | 15.25 |
| Use of open educational resources enables VU to reach disadvantaged communities. | 42.37 | 28.81 | 11.86 | 5.08 | 0 | 11.86 |
| Use of open educational resources is a form of assistance to developing countries. | 27.11 | 38.98 | 3.38 | 3.38 | 10.16 | 16.94 |
| Use of open educational resources enables VU to become independent of publishers. | 50.84 | 33.89 | 3.38 | 0 | 1.69 | 10.16 |

**Table No. 2** *General Perceptions of Virtual University Teachers about OERs Usage (%)*

| Perceptions of Virtual University Teachers about OERs Usage | Strongly Agree | Agree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|
| Use of open educational resources increases learners' participation in discussions. | 39 | 54 | 2 | 0 | 5 |
| Use of open educational resources increases learners' interest in the subjects taught. | 41 | 53 | 2 | 0 | 5 |
| Use of open educational resources increases learners' satisfaction with the learning experience. | 27 | 58 | 8 | 2 | 5 |
| Use of open educational resources leads to improved student grades. | 29 | 53 | 8 | 5 | 5 |
| Use of open educational resources builds learners' confidence. | 31 | 59 | 2 | 0 | 8 |
| Use of open educational resources develops learners' independence and self-reliance. | 37 | 51 | 3 | 2 | 7 |
| Use of open educational resources allows me to better accommodate diverse learners' needs. | 31 | 49 | 10 | 5 | 5 |
| Use of open educational resources increases learners' engagement with the lesson. | 24 | 61 | 5 | 3 | 7 |
| Use of open educational resources increases learners' experimentation with new ways of learning. | 31 | 58 | 3 | 3 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| **Use of open educational resources increases collaboration and/or peer-support amongst learners.** | 29 | 51 | 12 | 3 | 5 |
| **Use of open educational resources increases learners' enthusiasm for future study.** | 31 | 51 | 10 | 3 | 5 |

Majority of the VU teachers have positive perception towards the use of OER resources. Approximately 35-45% of the teachers gives positive response to the use of open educational resources gives me access to the best possible resources, use of open educational resources promotes scientific research and education as publicly open activities, use of open educational resources brings down costs for students, use of open educational resources brings down costs of instructional materials development for VU campuses, use of open educational resources enables VU to reach disadvantaged communities, use of open educational resources is a form of assistance to developing countries and use of open educational resources enables VU to become independent of publishers. However, Teachers face barriers that hinder use of OER and the table 3 given below shows the barriers faced by teachers when using OER.

**Table No.3** *Personal barriers for not using OERs in VU(%)*

| | Strongly Agree | Agree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|
| **I am not aware of open educational resources.** | 14 | 2 | 7 | 12 | 65 |
| **I do not have access to open educational resources.** | 8 | 8 | 8 | 14 | 62 |
| **Using open educational resources wastes time.** | 29 | 7 | 10 | 14 | 40 |
| **I do not know how to access open educational resources.** | 20 | 3 | 10 | 8 | 59 |
| **I prefer to use prescribed textbooks for the subjects that I teach.** | 8 | 5 | 10 | 17 | 60 |
| **It is too time consuming to use open educational resources.** | 31 | 3 | 7 | 12 | 47 |

When asked about the barriers faced by teachers in using OER, almost 40% of the teachers indicated that they do not have proper access to OERs and their students are not familiar with OERs. The other barriers identified by teachers are: 90% of the teachers indicated that they do have the ability to find OERs; 10% believe that using OERs wastes time and believes that it is too time consuming to use OERs.

To summarize, the results of the study indicate that students can use digital devices, software programs and they are using certain digital resources. Teachers have positive perception about the use of OER and its possible impact but more than half of the Teachers showed preference for textbooks rather than OERs. Not having proper access and non-familiarity with OER were mentioned as barriers by almost half of the teachers. The other barriers were not having the ability to find OER and that the use of OER is too time consuming and wastes time.

From the 30 Minhaj University teachers surveyed, 60% were male and 40% were female. Similarly like VU teachers Minhaj university (MU) teachers were asked about their proficiency and use of different digital resources such as using computer, tablet, smart phone, scanner, printer, email, different software programs and editing tools. The results indicate that 80% of the teachers can use computers, smart phones and tablets efficiently and independently. Almost 30% of the teachers could use scanner, editing tools, multimedia projector and printer. The digital and resources most frequently used by teachers are e-books, tutorials, slide presentations, online quizzes, videos, simulations and audios.

Table 4 and 5 show the perceptions of Minhaj University teachers about the different uses of Open Educational Resources.

**Table No. 4** *General Perceptions of Minhaj University Teachers about Benefits of OERs Usage (%)*

| Perceptions about Benefits of OERs Usage | Very Important | Important | Moderately Important | Slightly Important | Not Important | Not Applicable |
|---|---|---|---|---|---|---|
| Use of open educational resources gives me access to the best possible resources. | 35.60 | 19.43 | 13.06 | 24.81 | 5.56 | 1.53 |
| Use of open educational resources promotes scientific research and education as publicly open activities. | 4.08 | 23.63 | 9.22 | 21.01 | 32.91 | 9.14 |
| Use of open educational resources brings down costs for students. | 16.35 | 15.09 | 6.58 | 6.07 | 24.33 | 31.59 |
| Use of open educational resources brings down costs of instructional materials development. | 24.40 | 14.14 | 7.98 | 26.22 | 16.15 | 11.11 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Use of open educational resources enables MU to reach disadvantaged communities. | 22.98 | 12.00 | 7.50 | 24.72 | 25.58 | 7.22 |
| Use of open educational resources is a form of assistance to developing countries. | 6.70 | 33.37 | 3.10 | 9.55 | 38.19 | 9.10 |
| Use of open educational resources enables MU to become independent of publishers. | 29.73 | 17.29 | 0 | 8.33 | 26.68 | 17.95 |

**Table No. 5** *General Perceptions of Minhaj University Teachers about OERs Usage (%)*

| Perceptions of Virtual University Teachers about OERs Usage | Strongly Agree | Agree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|
| Use of open educational resources increases learners' participation in discussions. | 32.92 | 41.41 | 2.66 | 3.39 | 19.62 |
| Use of open educational resources increases learners' interest in the subjects taught. | 29.04 | 29.52 | 13.93 | 7.91 | 19.59 |
| Use of open educational resources increases learners' satisfaction with the learning experience. | 12.70 | 57.74 | 11.29 | 7.12 | 11.15 |
| Use of open educational resources Leads to improved student grades. | 22.92 | 37.85 | 9.71 | 10.77 | 18.74 |
| Use of open educational resources builds learners' confidence. | 18.76 | 40.89 | 16.75 | 6.23 | 17.38 |
| Use of open educational resources develops learners' independence and self-reliance. | 30.62 | 38.15 | 4.73 | 6.62 | 19.88 |

| | | | | | |
|---|---|---|---|---|---|
| Use of open educational resources allows me to better accommodate diverse learners' needs. | 26.31 | 47.01 | 10.93 | 14.80 | 0.96 |
| Use of open educational resources increases learners' engagement with the lesson. | 20.47 | 43.45 | 5.54 | 8.36 | 22.19 |
| Use of open educational resources increases learners' experimentation with new ways of learning. | 23.37 | 39.33 | 16.97 | 8.84 | 11.49 |
| Use of open educational resources increases collaboration and/or peer-support amongst learners. | 20.31 | 41.70 | 22.24 | 6.12 | 9.64 |
| Use of open educational resources increases learners' enthusiasm for future study. | 29.09 | 47.42 | 16.74 | 3.17 | 3.58 |

Majority of the MU teachers have positive perception towards the use of OER resources. Approximately 25-30% of the teachers gives positive response to the use of open educational resources gives me access to the best possible resources, use of open educational resources promotes scientific research and education as publicly open activities, use of open educational resources brings down costs for students, use of open educational resources brings down costs of instructional materials development for MU campuses, use of open educational resources enables MU to reach disadvantaged communities, use of open educational resources is a form of assistance to developing countries and  use of open educational resources enables MU to become independent of publishers. However, Teachers face barriers that hinder use of OER and the table 6 given below shows the barriers faced by teachers when using OER.

**Table No. 6** *Personal barriers for not using OERs in Minhaj University (%)*

| | Strongly Agree | Agree | Disagree | Strongly Disagree | Not Applicable |
|---|---|---|---|---|---|
| I am not aware of open educational resources. | 7.94 | 7.82 | 10.55 | 9.78 | 63.92 |
| I do not have access to open educational resources. | 3.96 | 13.85 | 17.97 | 9.76 | 54.46 |

| | | | | | |
|---|---|---|---|---|---|
| **Using open educational resources wastes time.** | 20.77 | 8.85 | 20.46 | 13.73 | 36.18 |
| **I do not know how to access open educational resources.** | 13.32 | 3.36 | 21.30 | 3.21 | 58.81 |
| **I prefer to use prescribed textbooks for the subjects that I teach.** | 0.91 | 11.22 | 24.58 | 13.61 | 49.67 |
| **It is too time consuming to use open educational resources.** | 21.79 | 5.54 | 19.97 | 9.84 | 42.86 |

When asked about the barriers faced by MU teachers in using OER, almost 64% of the teachers indicated that they do not have proper access to OERs and their students are not familiar with OERs. The other barriers identified by teachers are: 62% of the teachers indicated that they do have the ability to find OERs; 50% believe that using OERs wastes time and believes that it is too time consuming to use OERs.

To summarize, the results of the study indicate that teachers can use digital devices, software programs and they are using certain digital resources. Teachers have positive perception about the use of OER and its possible impact but more than half of the Teachers showed preference for textbooks rather than OERs. Not having proper access and non-familiarity with OER were mentioned as barriers by almost half of the teachers. The other barriers were not having the ability to find OER and that the use of OER is too time consuming and wastes time.

## Conclusion

The data for this study was collected from Virtual University and Minhaj University campuses. The results of the study indicate that in comparison to MU,VU teachers have more basic technological skills and most of the teachers have positive perceptions about the use of OER. The barrier of technology, infrastructure, access and non-familiarity is not applicable to the use of OERs in the computer labs. This study is valuable as it explores the use of OER by VU and MU teachers and their perception about the OER materials. The proper access is mentioned by teachers as one of the barriers and that may include many factors that limit the access of teachers to the OER resources. The teachers VU shows more positive perception than MU teachers about the factors: use of open educational resources gives me access to the best possible resources, use of open educational resources promotes scientific research and education as publicly open activities, use of open educational resources brings down costs for students, use of open educational resources brings down costs of instructional materials development for campuses, use of open educational resources is a form of assistance to developing countries and use of open educational resources enables VU to become more independent of publishers than MU.

This study is conducted to know the teachers perspective of using OER. The same study can be extended for knowing the student's perspective about the impact/use of OER on their studies.

## References

Albright, P. (2005). Open educational resources, open content for higher education: Final Forum Report. Paris: UNESCO.

Arendt, A. M., & Shelton, B. E. (2009). Incentives and disincentives for the use of OpenCourseWare. The International Review of Research in Open and Distributed Learning, 10(5).

Atkins, D. E., Brown, J. S., & Hammond, A. L. (2007). A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities. The William and Flora Hewlett Foundation.

Bissell, A. N. (2009). Permission granted: open licensing for educational resources. Open Learning, 24(1), 97-106.

Bliss, T. J., Hilton III, J., Wiley, D., & Thanos, K. (2013). The cost and quality of online open textbooks: Perceptions of community college faculty and students. *First Monday*, *18*(1).

Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2014). Interactive Learning Online at Public Universities: Evidence from a Six-Campus Randomized Trial. *Journal of Policy Analysis and Management*, *33*(1), 94-111.

Dhanarajan, G., & Porter, D. (2013). Open Educational Resources: An Asian Perspective. Published by Commonwealth of Learning and OER Asia, Vancouver. Available online: http://www. col. org/resources/publications/Pages/detail. Aspx. PID, 441, 30.

Feldstein, A., Martin, M., Hudson, A., Warren, K., Hilton III, J., & Wiley, D. (2012). Open textbooks and increased student access and outcomes. European Journal of Open, Distance and E-learning, 15(2).

Feldstein, P. J. (2012). Health care economics. Cengage Learning.

Geith, C., & Ignore, K. (2008). Access to Education with Online Learning and Open Educational Resources: Can They Close the Gap? Journal of asynchronous learning networks, 12(1), 105-126.

Hatakka, M. (2009). Build it and they will come?–Inhibiting factors for reuse of open content in developing countries. The Electronic Journal of Information Systems in Developing Countries, 37.

Harsasi, M. (2015). The Use of Open Educational Resources in Online Learning: A Study of Students' Perception. Turkish Online Journal of Distance Education, v16 n3 p74-87

Hilton III, J., & Laman, C. (2012). One college's use of an open psychology textbook. *Open Learning: The Journal of Open, Distance and e-Learning*, *27*(3), 265-272.

Johnstone, S. M. (2005). Open educational resources serve the world. Educause Quarterly, 28(3), 15.

Littlejohn, A., Falconer, I. and McGill, L. (2008) 'Characterizing effective eLearning resources'. Computers & Education, 50 (3), pp. 757-771.)

Larson, R. C., & Murray, M. E. (2008). Open Educational Resources for Blended Learning in High Schools: Overcoming Impediments in Developing Countries. Journal of Asynchronous Learning Networks, 12(1), 85-103.

Long, W. (2009). Review and Prospect: Seven-year Itch of Open Educational Resources. Open Education Research 15(2).

Lovett, M., Meyer, O., &Thille, C. (2008). JIME-The open learning initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning. Journal of Interactive Media in Education, 2008(1).

MacDowell, E., A. (2010). Using Open Educational Resources to Help Students Understand The Sub-Prime Lending Crisis. Journal of Business Education, Vol. 3, No. 11.

Mason, R. (1999). IET's Masters in open and distance education: What have we learned?. *CITE REPORT*.

Memon, G. R. (2007). Education in Pakistan: The key issues, problems and the new challenges. Journal of Management and Social Sciences, 3(1), 47-55.

MIT. (2006). 2005 program evaluation findings report (pp. 1–138).

Mozelius, P., & Hatakka, M. (2009, October). Conveyor Belt Production of Course Material–a Case Study in Sri Lanka. In 8th European conference on e-Learning, ECEL 2009, 29-30 October, Bari, Italy (pp. 406-412).

OECD (2007) Giving Knowledge for Free: The Emergence of Open Educational Resources.

Pagram, P., & Pagram, J. (2006). Issues in e-learning: A Thai case study. The Electronic Journal of Information Systems in Developing Countries, 26.

Rehmani, A. (2003). Impact of public examination system on teaching and learning in Pakistan. *Retrieved December*, *24*, 2010

Selinger, M. (2004). Cultural and pedagogical implications of a global e-learning programme. *Cambridge Journal of Education*, *34*(2), 223-239.

UNESCO (2002). UNESCO Promotes New Initiative for Free Educational Resources on the Internet.

Unicef. UNESCO (2007). A Human Rights-Based Approach to Education for All: A framework for the realization of children's right to education and rights within education.

Unwin, T. (2005). Towards a Framework for the Use of ICT in Teacher Training in Africa. Open Learning 20, 113-130.

Wiley, D., Hilton III, J. L., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in middle and high school science classes. The International Review of Research in Open and Distributed Learning, 13(3), 262-276.