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Creative Learning Environment and Knowledge Management

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Abstract

This is the era of knowledge and we are digging out information in the thirst of knowledge. In this growing knowledge society efficient technological tools must be used for the better management of knowledge. The Electronic Learning is the platform which provides the facility of interaction among knowledge holders and seekers. The knowledge conversion process is used to integrate the EL environment with the KM. The integration of EL and KM utilizing the Course Management System is proposed in this paper for the effective utilization of knowledge shared among individuals in online portals. Use of MOODLE as a CMS in EL portal implemented in Allama Iqbal Open University is explained showing the practical practice of KM and EL integration. The practical relationship among KM and EL can be analyzed and used for the effective utilization of knowledge.

Keywords: Knowledge Conversion Process, Electronic Learning, MOODLE

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1. Introduction

In the previous decade World Wide Web has taken the fundamental place of individuals in everyday life. The emergence of global network has changed the communication patterns of business and the personal communication with other individuals and machines. The revolution in this field is taking the world towards Knowledge Society, where we will find knowledge instead of information (Bonino, 2009).

The development of knowledge society has influenced our thinking about the computer usage. Computer is no more a simple "calculus engine" for calculations, it is not considered as a "gateway" for the entering the knowledge highway. The starting of 21st century brought big change in every sector specially the educational sector has adopted various revolutions. The emergence of Electronic Learning (EL) has changed the traditional method of education and presented a new concept of lifelong education. In order to utilize and manage these EL networks efficient management of uploaded knowledge is of great concern. The realization of this emerging need is causing a call for the knowledge management (KM) (Qinfei, 2010). The new technology implementation in an effective way produce a required benefits for the organization (Teo, & Too, 2000).

In previous literature considering the knowledge as an important entity is acknowledged. In spite of knowledge importance, the acquisition of knowledge in a better way for the effective performance of institutions is not completely understood. Facing and responding to new challenges in this discontinuous environment, management must understand the knowledge era (Lee, Chi-Wai Kwo, 2000).

2. Knowledge and knowledge management

2.1 Knowledge

The hierarchy of knowledge process starts from the "data", "information" and then "knowledge". The fact lacking the background is data. The organized and analyzed form of data is considered as information. While the information transforms to knowledge only when it is used in a meaning full and logical area, which is easy to verify with our experience. We can refer information to knowledge only when it gives answers to our assignments or problems (Davenport and Prusak, 1998a). In actual we dig out the information in the thirst of knowledge acquisition (Gunnlaugsdottir, 2003).

Knowledge is defined by different authors in their own respective ways. The most famous definition of knowledge is by Nonaka and Takeuchi (1995), considering knowledge as "justified True Belief". In 1989, Drucker completely differentiate the knowledge from data and information, considering the knowledge as a specialized and filtered form. Naeve (2005) explains the term knowledge as "efficient fantasies" which deals with the focus group, a rationale and a framework that are evaluated on efficiency basis. The Siemens (2006) explain the knowledge from individual perspective, saying that the knowledge rests in individual and be inherent in the group (Chatti, Jarke & Frosch-Wilke, 2007).

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2.2 KM (Knowledge management)

Managing the procedures involved in the formation, distribution and use of knowledge with the amalgamation of new technological and institutional structure and the individuals who are responsible for the creation of efficient learning, solving the problems and making strategic decisions; is the KM (Ubon, Kimble, 2002). Defining KM in exact manner is difficult. Much of the fresh literature on KM emphasize on need of KM's human side and recognizing for the individual input for effective KM (Akamavi & Kimble, 2005; Davenport & Völpel, 2001; Wilson, 2002).

The KM is seeking for the individual's confrontation with worthy knowledge and also the individual's interaction for getting the high performance, which is also the objective of EL (Chatti, Jarke & Frosch-Wilke, 2007). The KM objective to increase the educational learning that is seeking for the knowledge integration and sharing has gained inadequate success. The reason for this is that the institutions/individuals consider the "Knowledge as Recourse" instead of "Learning as a people Process" (Grace & Butler, 2005). Individuals are more focused on gaining knowledge instead of learning knowledge.

The focus of KM projects is

- The formation of repositories for knowledge.
- Make possible the capture, formation, shift, utilization, and sharing of knowledge.
- The management of knowledge as a valuable entity, constructing it, arranging it, and preserving it.

The main aim of KM is

- People interaction
- Giving the courage for creativity and innovation
- Initiating the issue of information to knowledge conversion among individuals (Abell & Oxbrow, 2001).

There is symmetry between KM and Educational System, both demands for the useable and experienced knowledge extracted from the information and data in existing or new resources (Marshall, Zhang, Chen, Lally, Shen, Fox, & Cassel, 2003). The formation of knowledge and process of codification lead to the performance enhancement and worth creation (Alavi & Leidner, 2001). When the knowledge is shared as a whole in institution and utilized exactly at the place where it was required then the value is formed (Grant, 1996).

The theoretical justification of our knowledge views is based on the Nonaka's (1991) organizational Knowledge Based Theory (KBT). Nonaka focus on the vitality of knowledge formation by considering the implicit and explicit elements of knowledge creation. The KBT complement the motionless view of "Knowledge assets" explained in previous KB view (e.g. Grant, 1996), and Dynamic capabilities theories (e.g. Teece, Pisano, &Shuen, 1997). In KBT tacit and explicit knowledge dynamically interact among the individuals and groups (Janhonen & Johanson, 2010).

Fewer theories are available for the effective management of transferring knowledge in big institutions. Researchers usually perform experiments to achieve the said problem (Braganza, Hackney & Tanudjojo, 2007).

2.3 Knowledge conversion process

2.3.1 Implicit or tacit knowledge

The knowledge of an individual which is not documented yet, though it is of great importance for the organization's flourishing. For example the employee experience, how to manage the sudden problems or discontinuities, knowledge of demands of customer and their expectations, the useful contacts for the organization. All of this knowledge can possible be documented for future use and is considered as implicit or tacit knowledge

2.3.2 Explicit knowledge

The documented form of implicit or tacit knowledge is explicit knowledge. The explicit knowledge may have different types; printed minutes of meeting, tutorial sessions on discs and tapes, documentaries, the official correspondence using faxes and e-mails, NOCs, Memos, Contracts, Plans etc (Gunnlaugsdottir, 2003).

2.3.2 Nonaka and takenuchi model

For the conversion of Tacit to Explicit and Explicit to Tacit knowledge Nonaka and Takenuchi (1995) Knowledge Conversion Process Model (KCPM) has taken great interest of researchers for the creation of new and innovative knowledge.
The knowledge conversion process follows the specific pattern

Socialization: this is also considered as Tacit-Tacit knowledge conversion, the individuals share their experiences and knowledge in a form of team in an organization or network. This is simply the transfer of knowledge among individuals when people meet or socialize at any place or community.
Externalization: also referred as Tacit- Explicit knowledge. The knowledge shared among individuals is totally the contextualized and based on individual experiences. The externalization is storing the tacit knowledge which is strongly the context-based facts into explicit knowledge with context-free knowledge condition in knowledge repository.
Internalization: this is also considered as Explicit- Tacit knowledge. The knowledge in the explicit form is taken out from the repository which is required by the person according to his need and relevance. Then that extracted knowledge is shifted to concerned person in the form of tacit knowledge which he can further use for his future working.
Combination: also considered as Explicit-Explicit knowledge. In this stage of knowledge conversion process new and innovative knowledge is often created. The categorization, sorting, addition and deletion of explicit knowledge in repository are performed in this stage. It is required to index and organize the explicit knowledge on regular basis for achieving the efficient retrieving of relevant knowledge and also for utilizing the available storage place (Bonino, 2009; Janhonen & Johanson, 2010).

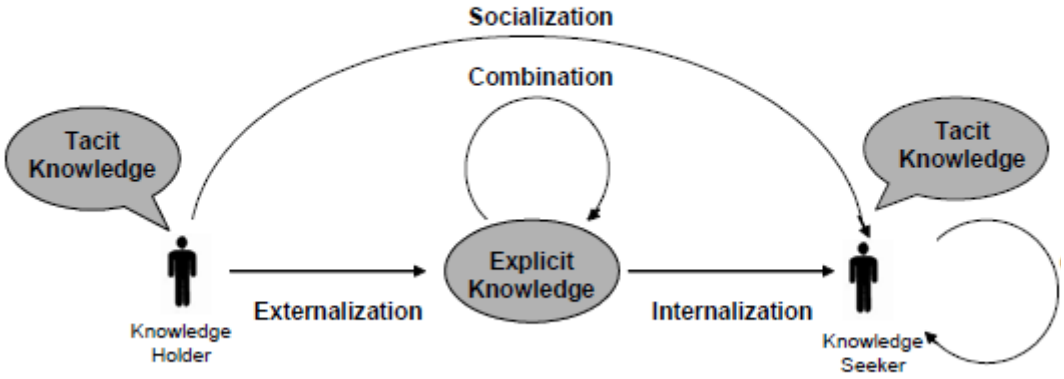


Figure. 1: Knowledge conversion process

3. Electronic learning

The electronic delivery of learning is considered as Electronic Learning (EL). The broad definition of EL is the delivery of learning material with the help of internet, satellite, computer, mobile and any other new technological equipment (Bonino, 2009). The importance of information technology is acknowledge by many researchers, thus it is moving towards support to strategic side (Teo, & Too, 2000).

The systematic and organized teaching and learning method with the help of Information and Communication Technologies (ICT) to provide the facility of interaction and communication without ground barriers is referred as EL or online education. The most famous terminologies used for EL are: WBT (Web-Based Learning), Webcast, Computer Based Training (CBT), interactive tutorials etc (Sammour, Schreurs, Al-Zoubi and Vanhoof, 2008).

Literature shows that the students do not get the satisfactory useful material from the EL portals, however consider the online portal easy to use. The integration of KM and EL might be fruitful for the quality knowledge retrieval (Lee, Kim & hackney, 2010).

Though the emergence of technology has provided the efficient and faster access to knowledge, but the value of direct human interaction can't be denied (Braganza et al, 2007).

3.1 Integration of KM and EL Need

Managing knowledge is not possible without the help of individual knower as compare to the information and data. Even with the knower help perfect management of knowledge is not achieved. There is much interaction among learners and instructors within the class room or outside the institution or network boundary and more knowledge is created which is mostly irrelevant. Centralization of knowledge is required for knowledge organization (Wilson, 2002).

The traditional institution's goal is following the Knowledge Push Model instead of Pull. Institutions just push the learners towards tons of contents and then have the expectation of quality learning. Considering that the knowledge is flexible and easy to absorb by nature institutions must shift from the knowledge push to knowledge pull approach (Naeve, 2005). The knowledge pull is the case when learners pull the content which is required by them in actual (Chatti, Jarke & Frosch-Wilke, 2007).

Learners must be freehand to pull the required knowledge from the complete data repository which is suitable and semantically related from anywhere with the restricted learning structure (Dzbor, Motta & Stutt, 2005).

EL is the wide area having different learning and teaching tools that integrate the multimedia, hypertext, network technology under one umbrella. The availability of vivid knowledge in EL Environment for the learners which meets their demands helps the learners and promotes the process of knowledge internalization. The ELE has given the facility of unlimited space and learning environment for the students. These facts are pushing the tacit knowledge to explicit knowledge, and promoting the socialization and externalization of knowledge. KM can help to solve the defects in EL systems. The effective integration of Knowledge Conversion process into EL will enhance the effectiveness of learning outcomes.

The presentation and visualization facility in EL encourage the internalization of knowledge. The courses separation provides the facility of extracting the relevant knowledge from the entire knowledge repository. This paper will show the possible combination of EL and KM. this combination will lead to a thoughtful modification in higher education (Qinfei, 2010). Researchers are now showing great interest towards the EL and KM and integration. Traditionally the EL system is considered as the recourse repository of knowledge, in which the KM methods can be integrated for the effective knowledge distribution (Sherwood, 2001).

3.2 KM's Impact on EL

When we are sharing, adopting knowledge and understanding more skills then it is the part of our learning. The KM role at this stage is very important with the acquisition of relevant knowledge for their learning. The internet has abundant information, and that information is used in the subjects. The quality learning is not only the understanding and knowing of new facts for a particular subject, rather it is the development of competencies in that domain. The KM process should be integrated deeply in the EL systems for the better content availability and enhancing performance (Sammour, Schreurs, Al-Zoubi and Vanhoof, 2008). Keeping in view the distinct nature of private and public sector organizations and cultural effects (Teo, & Koh, 2010).

4. Integration of KM and EL

4.1 Symmetry between KM and EL Systems

***System Structure*:** KM and EL systems both developed on client/server concept with the technical and complex nature of system at the server side and the user-friendly interface at the front end.

***Teamwork and Interaction*:** the learners and instructor interact with each other in both the systems with the synchronous and asynchronous communication facility. Both can discuss specific topic with the relevant material available in the system.

***Personalization*:** the knowledge available on the system can be modified and extended according to the need of user.

***Access regulation*:** the both systems do not allow the entry of strange user. Registration for accessing the knowledge available on system is required. The registered user also can't access all the information, they have the facility of accessing only specific subjects which are relevant to them (Sammour, Schreurs, Al-Zoubi and Vanhoof, 2008).

4.2 Traditional EL

The institutions with traditional ELE do not use the Externalization view of Knowledge Conversation Process. There is not any proper utilization of explicit knowledge, only the Tacit Knowledge is transferred to knowledge seekers. The knowledge seekers can take the benefit of already designed knowledge repository by the instructional designers and can also put back

their comments in the repository, but there is not proper input from knowledge holder or instructor.

The Educational Institutions face the following problems with Traditional EL.

- The instructional designers are not aware of the relevant content, weather to put that content in the course or not.
- The instructional designers know about the relevant content but they are not able to search that content in order to incorporate in the subject.
- Instructional designers have enough responsibilities that they can't communicate with the extra instructors and course coordinators; in a result they create few courses.

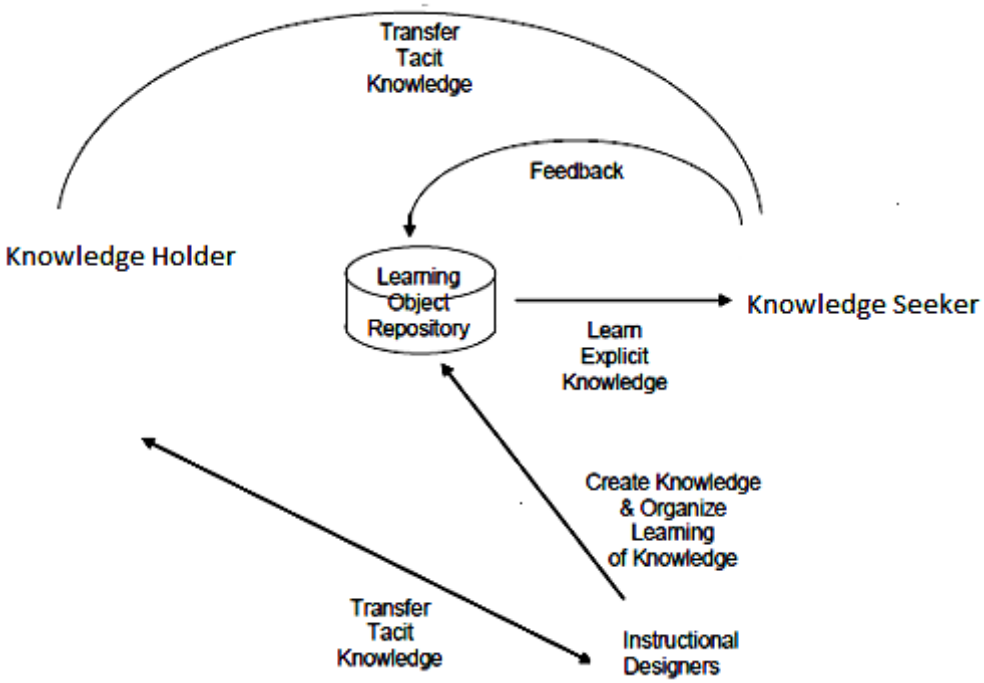


Figure. 2: Traditional electronic learning

4.3 KM Based EL

The Fig. 3 is showing the integration of KM and EL. The instructor (knowledge holder) can store his experience and knowledge (Tacit knowledge) in both the knowledge repository through externalization and can also transfer that to the learner (Knowledge seeker) via socialization. The KM has integrated the working of Knowledge organizer in EL system. The knowledge organizer will help in the placement of relevant information in it proper place for the purpose of refining and indexing the knowledge. The instructional designer was doing all the tasks in traditional EL at a time and was not able to provide effective results. In KM enhancement instructional designer is just working on the new learning aids creation, assignment posting and creating new modules. The learner is able to receive more knowledge from the knowledge repository through internalization and also from the instructor through socialization. The learners learn from these sources and then do further working. The working and performance of the leaner is operationalize and then again returned to the knowledge repository as a feedback.

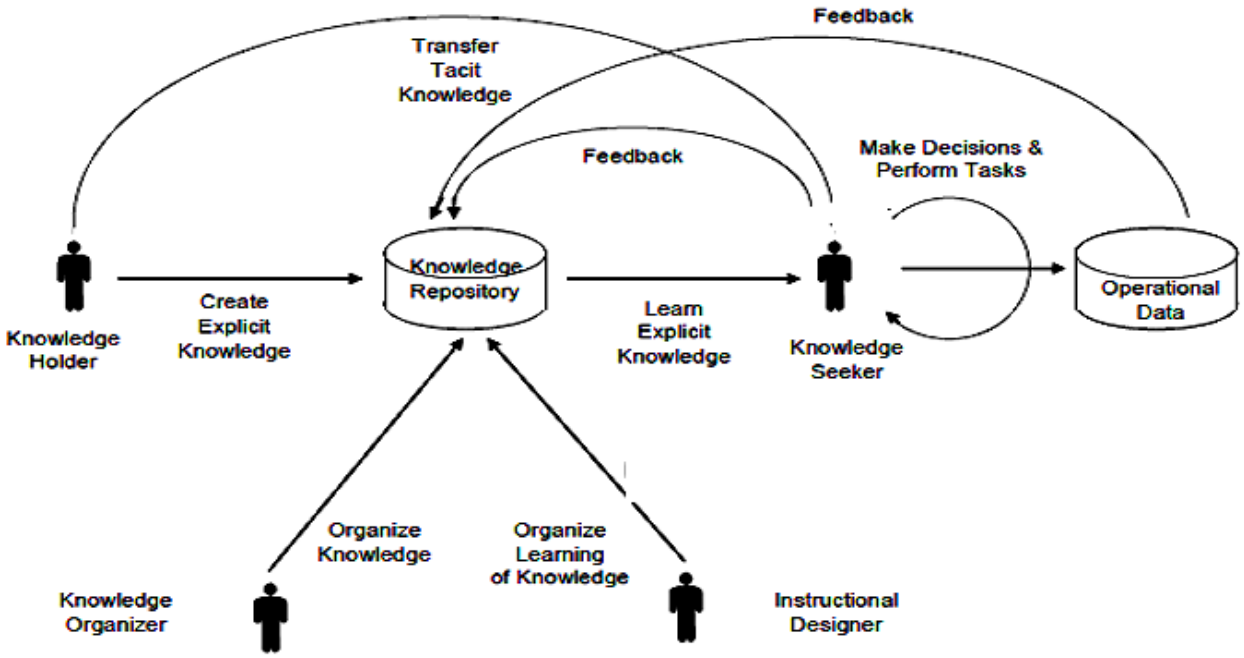


Figure 3: Knowledge management based electronic learning

4.4 Course management system CMS (MOODLE)

The KM can take help of different tools for the indexing, storing and retrieving information in the ELE for the better collaboration and achieving quality knowledge. The new innovative knowledge is created using the combination approach of KM knowledge conversion process with the proper management of documents there categorization and production. The use of Course Management System (CMS) can be utilized for achieving the explicit- explicit conversion of knowledge.

A CMS can be freeware or paid user-friendly software that enables the management or indexing of knowledge in EL system. The CMS provides the facility of controlling and monitoring the activities of registered users. All the changes done by the instructor, learner, and coordinator are stored in the system (Bonino, 2009).

CMS provides the facility of integrating knowledge and information and efficient utilization of useful exchanged data. ICT support the knowledge integration, via using the CMS explicit knowledge storage, faster retrieval and efficient utilization can be achieved through simple coding (Huber, 1990). The use of CMS is ELE can improve the learning effectiveness (Lado & Zhang, 1998), moreover the ELE can provide the access to more new and innovative knowledge (Yan & Lewis, 1999). The CMS provides the facility of indexing and providing the useful information and spreading the knowledge for large population in ELE (Bianco & Michelino, 2010). The Fig. 4 provides the integration of CMS in KM based EL system. The most famous freeware CMS is the MOODLE that provides the facility of managing all the EL requirements.

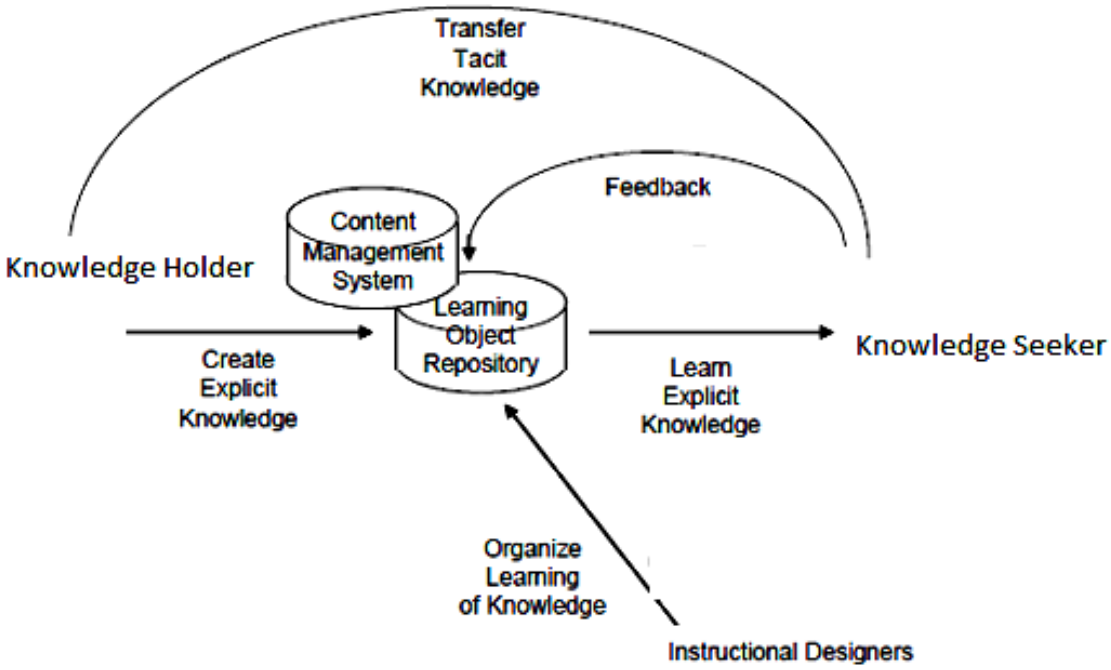


Figure 4: Course management system integration in knowledge management based electronic

5. EL Portal

This paper is presenting an EL portal Fig. 5, which is using the KM approach and also the CMS. This portal is used by the Commonwealth MBA/MPA Program, English Department and Computer Department of Allama Iqbal Open University, Islamabad Pakistan. The MOODLE is used as a CMS for EL portal. There are regular classes for the courses and relevant material is uploaded in each course for the students. The material is uploaded by the teacher and also the administrator, considering the relevancy matter. The administrator works as a knowledge organizer while the instructor role is to provide his explicit knowledge to students and also to the knowledge repository. This system can only be used by the registered users for security and relevancy purpose.

EL portal is a personalized GUI based interface which provides the knowledge of relevant domain to students. Instructor can integrate the relevant information in the course that can be monitored by the administrator later.

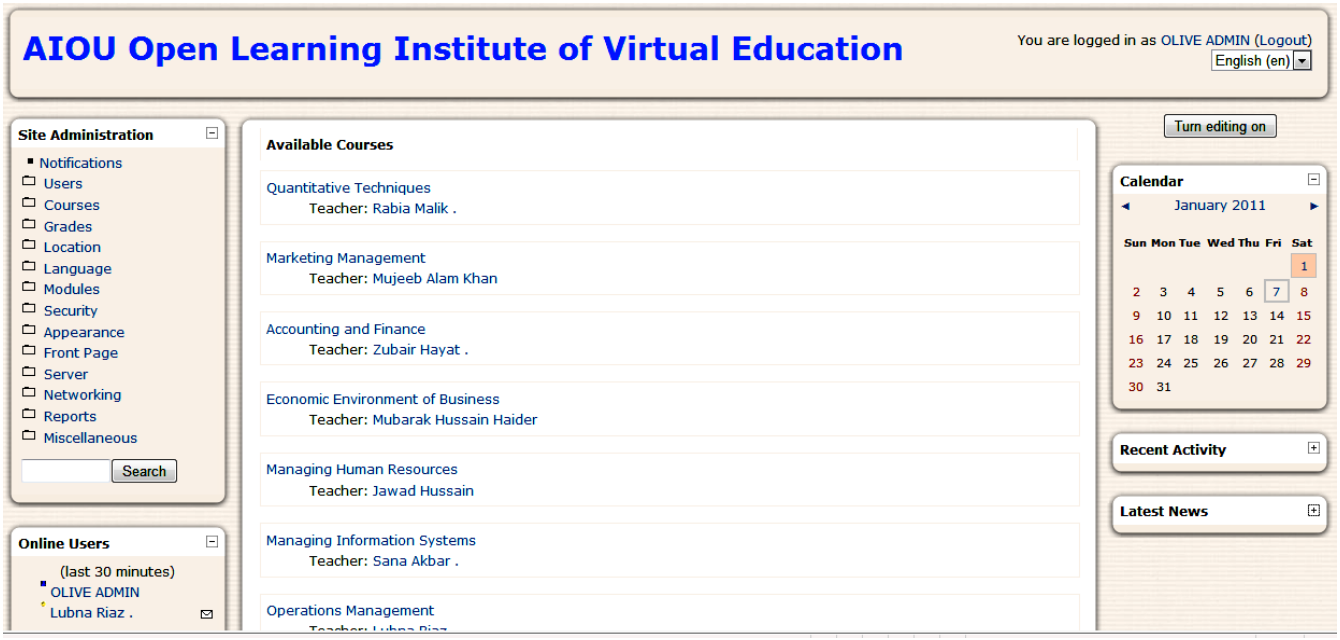


Figure 5: Electronic learning portal

5.1 Course building

The course created on the portal are unique, having the contents relevant to the specific domain. The research material, experiences are uploaded in the course. The *guidelines* for uploading the relevant information are also available at the start of the page by the administrator for instructor at the start of the semester, in order to upload the relevant material. These guidelines improve the quality of course contents, the material which is not relevant to the course is been deleted by the administrator. The Fig. 6 is showing the designed course of Research Methodology on MOODLE.

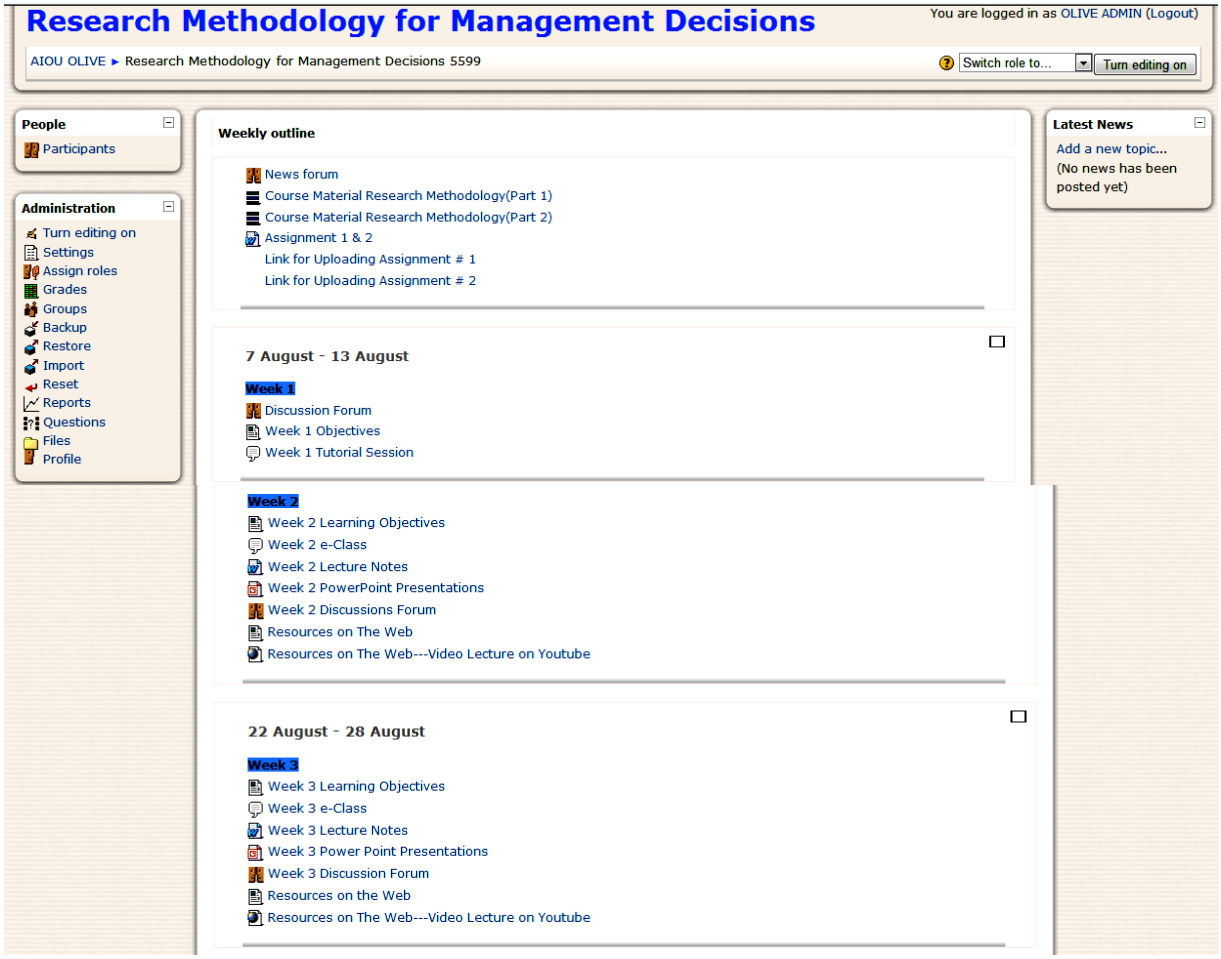


Figure 6: Course design on course management system learning.

5.2 Dynamism of content delivery

The EL portal based on MOODLE has the content which is arranged and modularized by the content developers. Only the authorized users can do the required modifications and integrations in the course in order to make it up to date and relevant. The authorized person can only be instructor or administrator which can turn on the editing option as shown in Fig. 7. This will enable the editing options in the course.

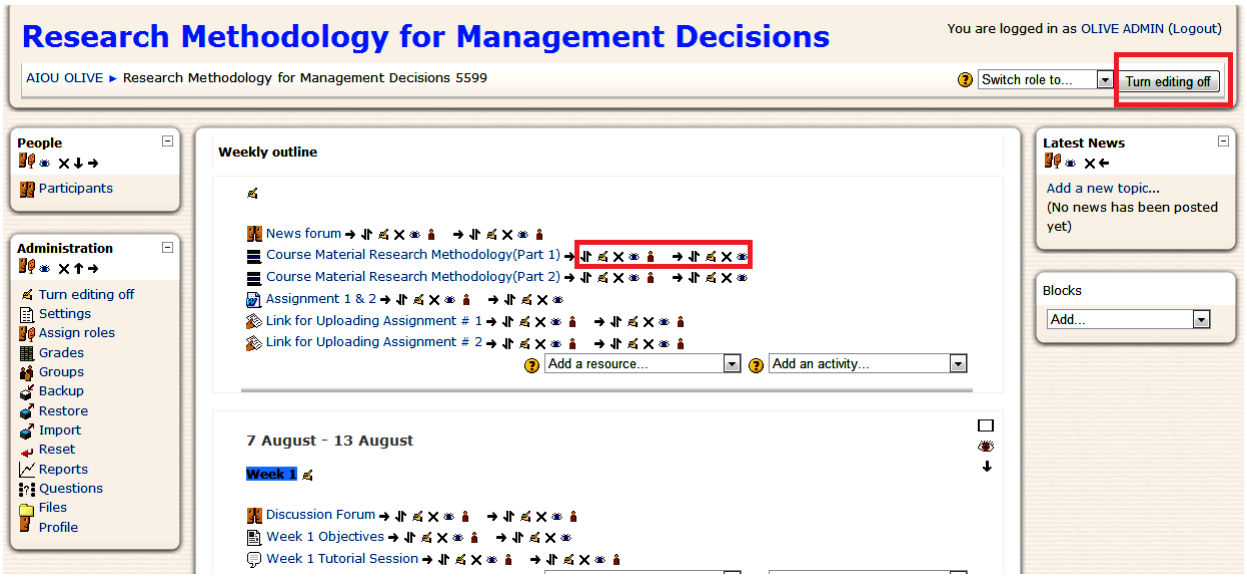


Figure 7: Authorized use

The Fig. 8 is showing the view of presentation module in the MOODLE. This module is not available in the freeware MOODLE version, as the MOODLE is open source; the software developers in Allama Iqbal Open University has integrated this new module in the MOODLE for the better delivery of learning to students.

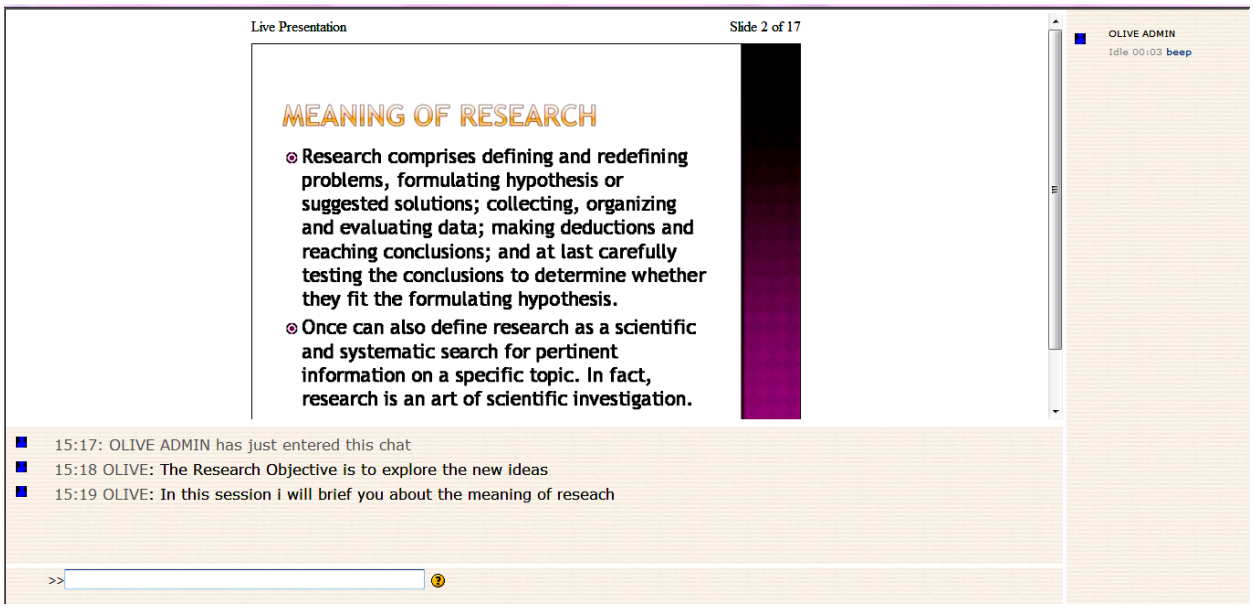


Figure 8: Presentation

5.3 Assessment process

MOODLE provide the facility of online assessment of student performance. As shown in Fig. 9 the assignments are uploaded for the students at the start of the semester with the proper guidelines of attending the questions asked. The links are available for uploading the completed assignments on the mentioned dates.

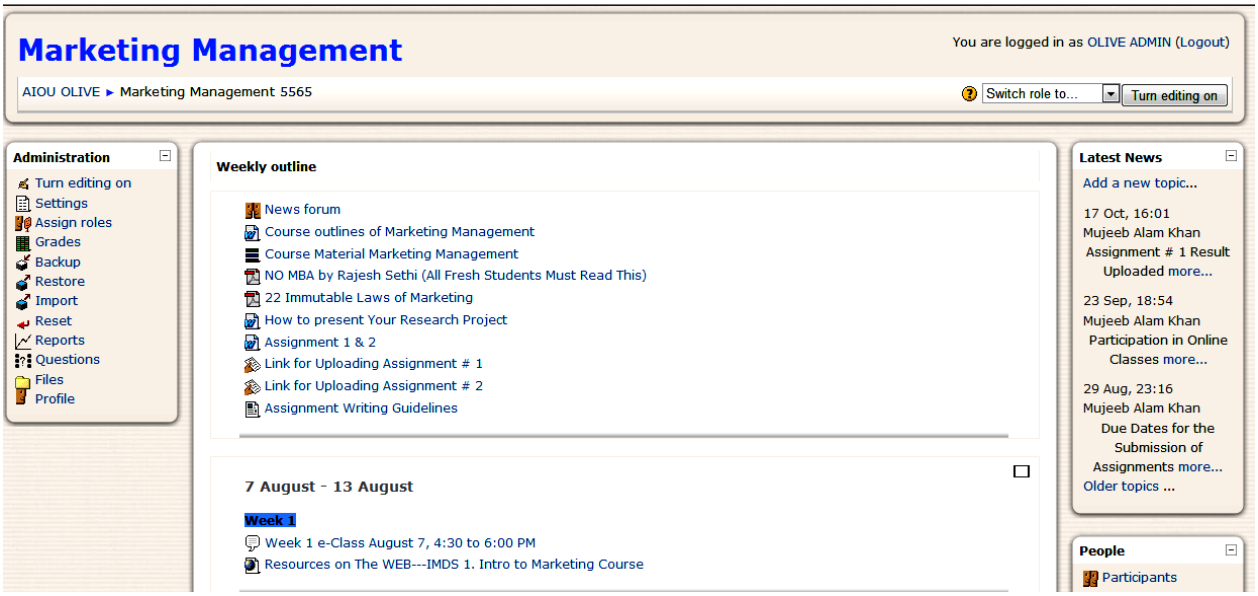
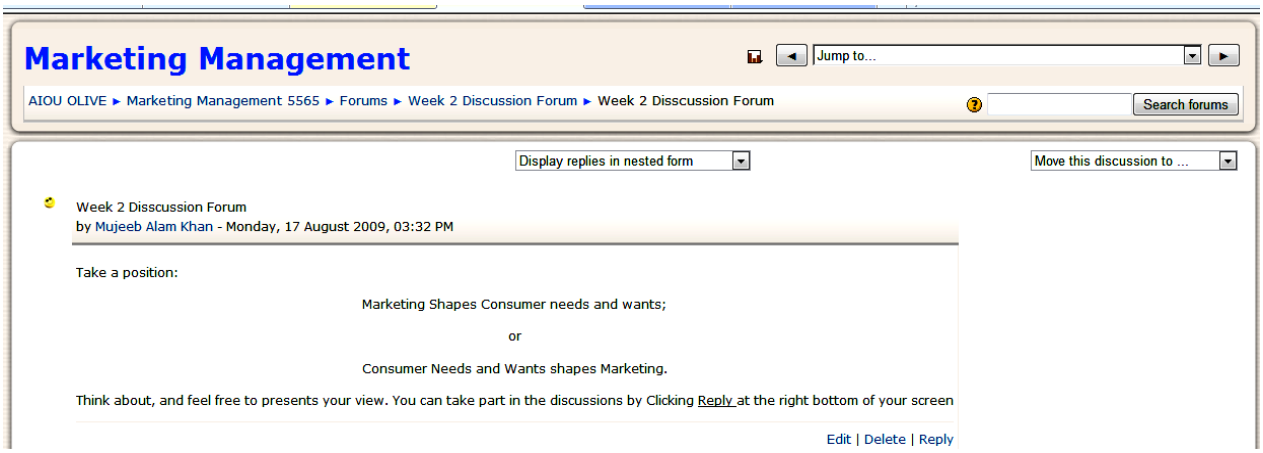


Figure 9: Assessment process

5.4 Discussion forums

The facility of discussion forums in EL portal gives the edge of wide learning to students. Students can ask questions from teacher or other mates on the relevant topic of the week. The two students can do communication or the large group can also discuss on a point. All of these activities are properly managed and monitored by the administrator. Fig. 10 is showing the graphical representation of Discussion forums.



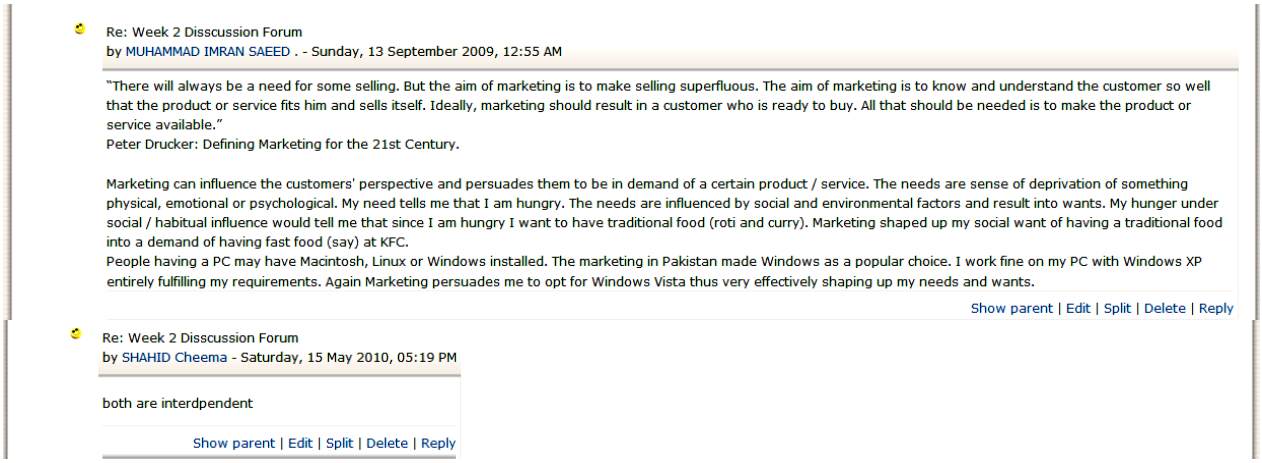


Figure 10: Discussion forums

6. Conclusion

This paper is showing the usefulness of KM and EL integration. How we can efficiently utilize the EL technology with the KM integration for the learners quality learning and benefit. The knowledge management develops a mutual interaction environment for knowledge sharing among learners and instructors. The learning processes of learners become efficient and innovative due to this interaction. Use of KM based EL portals provide the facility of learning from a specific domain and can retrieve relevant knowledge due to CMS facility. In discussion forums of MOODLE students and instructor perform socialization and then internalization and externalization for creating the explicit knowledge; however the CMS perform the task of combination for the new and quality knowledge creation. The integration of KM with EL systems with the use of CMS will be useful for the efficient capturing of knowledge and its delivery for quality learning.

References

Bonino, D. (2009). Architectures and Algorithms for Intelligent (Web) Applications: How to Bring More Intelligence to the Web and Beyond. VDM Verlag, Saarbrücken, Germany.

Ubon, A. N., & Kimble, C. (2002). Knowledge Management in Online Distance Education. In Proceedings of the 3rd International Conference Networked Learning 2002, University of Sheffield, UK, March 2002, 465-47.

Marshall, B., Zhang, Y., Chen, H., Lally, A., Shen, R., Fox, E., & Cassel, L.N. (2003). Convergence of knowledge management and e-learning: the GetSmart experience. *ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, 135-146.

Nonaka, I. & Takeuchi, H. (1995). The Knowledge-Creating Company, Oxford Univ. Press, NY.

Lee, J. N. & Chi-Wai Kwok, R. (2000).A fuzzy GSS framework for organizational knowledge acquisition *International Journal of Information Management*. 20, 383-398.

Chatti, M.A., Jarke, M. & Frosch-Wilke, D. (2007). The future of e-learning: a shift to knowledge networking and social software. *International Journal of Knowledge and Learning.* 3(4/5), 404–420.

Gunnlaugsdottir, J. (2003). Seek and you will find share and you will benefit: organizing knowledge using groupware systems. *International Journal of Information Management.* 23, 363–380

Grace, A. & Butler, T. (2005). Learning management systems: a new beginning in the management of learning and knowledge. *International Journal of Knowledge and Learning*. 1(1/2), 12–24.

Janhonen, M. & Johanson, J.E. (2010) Role of knowledge conversion and social networks in team performance. *International Journal of Information Management*. Article in Press.

Sammour, G., Schreurs, J., Al-Zoubi, A.Y. & Vanhoof, K. (2008). The role of knowledge management and e-learning in professional development. *International Journal of Knowledge and Learning*. 4(5), 465–477.

Dzbor, M., Motta, E. & Stutt, A. (2005). Achieving higher-level learning through adaptable Semantic Web applications. *International Journal of Knowledge and Learning*. 1(1/2), 25-43.

Bianco, F. & Michelino, F. (2010). The role of content management systems in publishing firms *International Journal of Information Management.* 30, 117-124.

Davenport, T. H., & Prusak, L. (1998a). Know what you know. CIO Magazine, available at http://www.cio.com/ Archive.

Drucker, P.F. (1989). The New Realities: In Government and Politics, in Economics and Business, in Society and World View. New York: Harper & Row.

Naeve, A. (2005). The human semantic web – shifting from knowledge push to knowledge pull. *International Journal of Semantic Web and Information Systems.* 1(3), 1-30.

Siemens, G. (2006). Knowing Knowledge. Lulu.com, ISBN: 978-1-4303-0230-8.

Akamavi, N. & Kimble, C. (2005). Knowledge sharing and computer supported collaborative work: the role of organisational culture and trust. *Proceedings of the 10th Annual Conference of the United Kingdom Academy of Information Systems (UKAIS 2005).* Newcastle upon Tyne, UK, 22–24 March.

Davenport, T.H. & Völpel, S.C. (2001). The rise of knowledge towards attention management. *Journal of Knowledge Management*. 5(3), 212-221.

Wilson, T.D. (2002). The nonsense of 'knowledge management'. *Information Research*. 8(1), 144.

Abell, A., & Oxbrow, N. (2001). Competing with knowledge: The information professional in the knowledge management age. London: TFPL, Library Association Publishing.

Alavi, M., & Leidner, D.E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*. 25, 107-136.

Grant, R. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*. 17, 109-122.

Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, 69, 96-104.

Teece, D.J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal.* 18, 509-533.

Teo, T.S.H., Tan, M., & Wong, K.B (1998). A contingency model of Internet adoption in Singapore, *International Journal of Electronic Commerce*, 2(2), 95-118.

Teo, T.S.H., & Koh, T.K (2010). Lessons from multi-agency information management projects: Case of the Online Business Licensing Service (OBLS) Project, Singapore. *International Journal of Information Management*, 30(1), 85-93.

Teo, T.S.H., & Too, B.L. (2000). Information systems orientation and business use of the Internet: An empirical study. *International Journal of Electronic Commerce*, 4(4), 105-130.

Sherwood, C. (2001). Knowledge management for elearning. *International Conference on Engineering Education.* Technical tour, Oslo and Bergen, Norway, 6-10 August.

Huber, G. P. (1990). A theory of the effects of advanced information technologies on organizational design, intelligence and decision making. *Academy of Management Review*, 15(1), 47-71.

Lado, A. A., & Zhang, M. J. (1998). Expert systems, knowledge development and utilization, and sustained competitive advantage: A resource-based model. *Journal of Management*. 24(4), 489-509.

Yan, A., & Lewis, M. R. (1999). The migration of organizational functions to the work unit level buffering, spanning, bringing up boundaries. *Human Relations*. 52(1), 25-47.