Developing Knowledge Generation, Communication and Management in Teacher Education:

A Successful Attempt at Teaching Novice Computer Users

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ABSTRACT

This unique colloquium of research for lecturers took place in an academic college of education focused on discussing and peer reviewing through an On-Line Forum and on participating in a conference. Both aimed at enhancing the level and quality of the research activity in the college by developing knowledge generation, communication and management. This study followed studies, which indicated that lecturers do not know and experience enough about generating, communicating and managing knowledge, especially with regards to the didactics of knowledge.

Most of the studies carried out by the lecturers who participated in the colloquium focused on integrating disciplines with pedagogic-didactic applications. The method of the colloquium was based on virtual peer teaching, sharing their generated knowledge and experience, and then managing it.

The findings indicated that the process was advanced very fast. The lecturers were able to integrate theory and practice while carrying out their research and instruction. This certainly affected the lecturers' professional quality up to a level where they were capable of reviewing peers' research, following the quick learning through the e-learning system, and managing the collaborative research work. The procedure used in this research fostered the lecturers' quality of planning, designing and evaluating the research. They, especially, increased their ability and motivation for transferring products to the virtual forum in order to get the peers' remarks regarding the issues. The process occurred successfully apparently thanks to the collaborative activity. Consequently, the lecturers gradually learned to evaluate and manage their own research. The method enabled activating the knowledge in the real world according to the method implemented in business projects. The cooperation through the computer world resulted in peer reviewing, exchanging and arranging documents, etc.

Keywords: Colloquium, Conference, Knowledge Generation, Knowledge Communication, Knowledge Management, Online Forum, Peer Reviewing, Teacher Education.

1. INTRODUCTION

The latest Studies show that conferences improve knowledge communication of college lecturers (1) (2). Through this process, the lecturers designed and performed research while communicating and reviewing one each other work (3) (4).

This research can affect knowledge generation, communication and management while preparing student teachers in college, theoretically and practically, as will be detailed below.

The scientific contribution of the research colloquium concerning these three dimensions of knowledge focuses mainly on five issues:

1. Presenting new ideas and innovations that have not been disseminated in any other way.
2. Enhancing the professional communication among the lecturers.
3. Discussing highly important issues.
4. Enabling lecturers to contribute and receive new ideas and materials for teachers and student teachers.
5. Carrying out studies based on disciplinary, inter-disciplinary and multi-disciplinary areas, while incorporating them with pedagogy.

2. THEORETICAL REVIEW

Knowledge is usually communicated. Pre-service teacher education programs are being called on to provide models of authentic teaching, and to help teachers to develop their knowledge of the content, discourse, and content-specific pedagogy. They also must provide multiple perspectives on K-12 students as learners, and offer meaningful opportunities for teachers to develop skills in using the technology (International Society for Technology in Education, (5)). It is essential that all K-12 teachers will be able to demonstrate an ability to use technology tools in their standards-based curriculum to promote student learning, improve student achievement, and provide students with the skills they need in their future education and/or workplace careers. In 1999, the U.S. Department of Education established the Preparing Tomorrow's Teachers to use Technology program in order to support organizational change in teacher education so that future teachers are able to use interactive information and communication technologies for improving learning and achievement (6). The National Research Council (NRC) in its publication How People Learn: Brain, Mind, Experiences and School (7) argued that "technology resources for education, whether a software science simulation or an interactive reading exercise, function in a social environment, mediated by learning conversations with peers and teachers" (p. 218). Using synchronous and asynchronous communication, hypertext based programs to promote debate, "real life" problems, and computer programs such as databases and artificial intelligence, enables distance education learners to work together to solve problems and provide the social interaction necessary to translate educational material into meaningful experiences (8).

The World Wide Web supports information sharing with the dual aspects of publishing and finding information. As the Web has expanded to embrace a diverse population of users and a

broad range of uses, more activities have become important, for example: regular activities like person-to-person communication and educational activities such as online course materials, interactive tutorials and distributed science experiments (9).

With regards to the combination of knowledge and communication, Montgomery (10) concludes that research and communication form a continuum. He stresses that in the real world of daily scientific work, the scientific understanding is an integral part of the written and spoken word. Research involves communicating among a number of central activities, such as: "identifying and studying examples of successful expression in the chosen field" (p. 7), reading "as writers do, with a critical eye and ear for quality, for what is worthy of imitation" (p. 7), focusing also on data and conclusions and final products.

Harnad (11) indicated that ideas and findings are discussed informally with peers. This is an interactive process that will substantially restructure the pursuit of knowledge.

According to Vigotsky (12) learners actively construct concepts through the process of mediated actions. According to the notion of mediated actions, human beings use cultural tools (such as language as well as tangible features of the environment) which fundamentally change the structure of the cognitive functioning and activity (13) (14). Beaufort (15) and Kezar (16) believe that the faculty instructors can only be affected by changes such as using technology in their teaching program if they are actively engaged in creating the change that is taking place.

The notion of Fullan (17) regarding "relationship building" and "shared knowledge" serves as a means for creating shared language and shared responsibility toward technology, a crucial step toward the development of a shared vision about technology in education and a coherent strategy in the school of education for meeting state and national technology standards. It has been argued that in order to achieve meaningful and lasting educational reform, teachers must collaborate around a strong and commonly held and understood shared sense of purpose (18) (19).

Under increasing pressure, many industrial enterprises are seeking means to improve their performance. Years of rationalizations led to the conclusion that no one-time improvement will enable continuing success. Thus companies realize that their edge lies in the transformation of knowledge to action. The field of knowledge management addresses a broad range of aspects but is still rooted in a rather technical methodology. Establishing knowledge management is a process of organizational innovation. As the implementation of application advanced and became a major driving force of organizational innovation as a means for establishing integrated knowledge management at operational business levels seems promising. This paper will present the knowledge network concept as a means of establishing an integrated approach to knowledge management and will highlight it using observations made during system implementation of the projects' application (20).

The three dimensions of knowledge require meta-knowledge. These three knowledge's dimensions are highly related among each other. Information and Communication Technologies are increasingly supporting the effectiveness and efficiency of knowledge generation, communication and management, as well as the relationships among them.

The phenomena of knowledge generation, communication and/or management have been addressed in the academic, private and public sectors; in universities, business; disciplinary research and multidisciplinary projects (21).

Along with the main objective of the present paper: developing knowledge generation, communication and management of college lecturers through peer reviewing and discussions regarding methods of research for teacher education, each of whom carried out a research project. This research was aimed at advancing this issue (22).

3. RESEARCH PRESENTATION

The group was composed of 14 lecturers, expert in a variety of disciplines of teacher education in the same college.

The research focused on the assumption that carrying out self research, discussing it by online forum and peer reviewing, and participating in a conference based on research guidelines, would develop knowledge generation, communication and management of lecturers. Consequently, the research activity and quality of the lecturers would increase and advance.

The training was designed to last one year. The communication of the main researcher with the participants was conducted once a week and more as needed.

At the end of the year each lecturer among the participants in the research colloquium was asked to give a paper. The papers were then published in the research publication book of the institution.

The research report on this colloquium was based on qualitative research composed of using online forum and conferencing.

The research Method

The lecturers planned their study and reported about each stage they made. Then they sent it to the online forum through a national e-learning site. The lecturers' research was focused on theoretical and practical questions and difficulties in carrying out the study. Thanks to the use of this method based on instruction via the forum, and the personal involvement of the participants in the research process the lecturers became very motivated and diligent in their work. Moreover, collaborative discussions of the participants in the colloquium and peer reviewing regarding the studies served as integral components of the research activity of this colloquium.

The conference took place in the middle of the year. It was based on inviting expert lecturers in their expertise domain of research. The presentations were related to teacher education in order to present relevant topics for the workshop's program, such as: "Basic Guidelines of Writing a Scientific Paper", "Quantitative or Qualitative Research and Integrative Methods, How, Which and When?" etc. Then the participants discussed its application.

The Teaching Procedure and its Importance

The Online workshop dealt with enhancing the research activity focusing on teacher education. The uniqueness of the Online forum became clear to the lecturers as they communicated through online forum, where they discussed and consulted regarding their own and their peers' research issues. As the research activity proceeded, they reported the procedure they used according to the guidelines they had received for writing a research paper.

1. Generating and communicating knowledge by transferring the research reports through e-learning software; then evaluating each one by at least two peer reviewers, changing or fixing them according to the remarks given by the reviewers and sending it to them again for final evaluation.

2. Gathering the knowledge and managing it, accordingly.
3. Integrating theoretical and practical knowledge, and applying it by the student teachers in their practical work.

The techniques used for fostering the virtual interaction between the lecturers:
1. Engaging the contents with real life experiences of the lecturers and implementing it in their practical work with the students.
2. Focusing on the research requirements of the lecturers, for example, evaluating questionnaires intended to be filled by the students.
3. The conference plan met the lecturers' needs for carrying out their research, while each paper presented complemented each other.
4. Communicating personally, directly and virtually, among each lecturer and the coordinator, especially before transferring the information to the forum.

Through this study, the knowledge generation of each lecturer was developed by carrying out a research regarding his/her work in the college dealing with teacher education. Then also the knowledge communication between the lecturers as a group was developed. Consequently, the lecturers guided by the coordinator gathered the knowledge and managed it together. Usually, the virtual relationships between the lecturers tend to focus on a discipline. However the method used in this research created interdisciplinary relationships. These relationships leaded also to inter personal communication between the lecturers. This type of communication was manifested during and after the conference.

Evaluation:
1. Comparing the products created by the lecturers.
2. Comparing the level of the reviewing in each procedure.
3. Examining the level of the student teachers' practical work.

4. FINDINGS

The lecturers learned to design and carry out educational highly scientific research. The lecturers also learned to evaluate others' and their own research products. The sources of knowledge included the Internet and the online forum. The lecturers used these sources for evaluating the reports by their peers who participated in the same colloquium. The reports of the lecturers became clearer and more detailed as well. The lecturers became aware of the relationships between the pedagogic-didactic achievements and the theoretical scientific approaches they used as the basis of their studies. Furthermore the motivation of the lecturers and their self-confidence were also promoted. The change in the interaction created between the lecturers became quickly, especially when considering the absence of experience in using computers before the study.

The lecturers noted that carrying out their research while using the online forum and participating in the conference assisted their proceeding in the project (See Table 1).

Table 1: Example of Differences between the Level of Research Performance of the Lecturers at the Beginning and Intermediate Stages of the Colloquium

Starting the Colloquium	Intermediate Data
Focusing on theory exclusively.	Applying the theory to the practical work.
Editing the research, in general, without using authentic examples.	Editing the research according to the standards.
Writing long complex sentences.	Formulating brief sentences.
Lacking knowledge and experience at differentiating between the research methods and its definitions.	Differentiating between the methods of research, especially quantitative and qualitative, then integrating both of them, accordingly.
Focusing on using E-mail exclusively.	Communicating through online forum frequently and fluently.
Focusing on some objectives. Having difficulty differentiating between main and sub objectives. Having difficulty formulating the assumptions. Having difficulty defining dependent and independent variables.	Focusing on the main objective and assumptions. Then defining the dependent and independent variables, correctly.
Sharing the knowledge with the coordinator.	Generating, communicating and managing the knowledge with the colloquium's team.
Mixing results and discussion.	Differentiating between results and discussion, Summarizing each table of the results briefly, Then concentrating on the discussion and analyzing the results according to the theory.

6. SUMMARY AND CONCLUSIONS

The present study showed that communicating academically among the lecturers, through the direct and virtual colloquium, fostered knowledge generation, communication and management. The results also indicated that the lecturers increased their theoretical knowledge (23) (24), and applied the best research methods for each.

The scientific importance of the research lies in the lecturers' increased ability to carry out research, write high level academic report while telecommunicating and sharing knowledge (3) (4) (25) (26). The collaboration of knowledge among the lecturers as well as student teachers (25) created social interaction between them, that is necessary for accommodating with "real life" problems that appear in the real world of daily scientific work (10). Consequently, basing the interaction on real life activities, apparently, affected educational environments of their student teachers. This resulted in improving knowledge communication during the courses, while the lecturers themselves would apply the method used in the research colloquium. Education is being partially transformed by new technologies. At one time, students could learn a small, but fixed body of knowledge. However, currently, the enormous amount of available information, coupled with the fact that the amount of knowledge in the world continues to grow at an increasingly quick rate, requires a transformative approach to education. It is imperative that the student of nowadays learns how to be an information manager (27).

In a technology-rich environment, one must remember that the educational focus is on learning and instructional goals instead of the technology itself, because technologies are merely tools or vehicles for delivering instruction (28).

Barr (28) goes on to say, "If we wish to prepare students for life-long learning, we must begin to introduce them to the tools which they will use in the careers they pursue after their formal education is completed" (p. 84).

The approach of activating knowledge that has been investigated in business (20) was implemented in our case with regards to education. The implementations were manifested by using the knowledge practically and operating it according to the learning contents and experience of the colloquium's team. The direct and virtual conversations between the participants dealt with the research contents rather than accompanied talking. The conversations became meaningful as much as the lecturers used real life in their research work. The cooperation in the computer-world is maintained by the students and teachers' meetings in virtual knowledge areas where they can actively deposit, jointly view, exchange and arrange documents. In addition, they can annotate each other's documents and link them to one another and to external resources (30).

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