The role of collaboration in enhancing knowledge integration in higher education

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ABSTRACT

Knowledge in higher education should be closely related to research and innovation; research brings together teams from different disciplines to develop new ideas that may lead to advancing innovation. Collaboration is a data-centric activity at which each discipline shares information with other disciplines to create a common model, and integration which is knowledge-centric stipulates that each discipline contributes knowledge. Unlike collaboration, integration relies on participants sharing their knowledge. Knowledge integration is the process of combining many knowledge models and diversity of perspectives into a corporate model.

Collaboration efforts in higher education are needed between institutions, not only to set the standards that would secure the quality assurance in higher education, but also to share experiences and knowledge among higher education institutions.

On the other hand, integrating knowledge diversity is a crucial element, countries or a group of countries that share common background shall collaborate and create new approaches that take into consideration “their local” cultural heritage, wisdom and experiences to pave the way for better cooperation and knowledge integration.

In order to have more integrated approach and to address new issues, some forums should be created on the national level to launch new initiatives towards transformation of knowledge in higher education, keeping in mind that regional and global collaboration will always be essential for success. These initiatives would help in setting new mechanisms to integrate knowledge among new disciplines and setting new standards, new applications and also to assure collaboration that would lead to enhancing knowledge integration.

Keywords: knowledge, collaboration, integration, innovation, indigenous.

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INTRODUCTION

Collaboration is a data-centric activity at which each discipline shares information with other disciplines to create a common model, and integration which is knowledge-centric stipulates that each discipline contributes knowledge. Unlike collaboration, integration relies on participants sharing their knowledge. Knowledge integration is the process of combining many knowledge models and diversity of perspectives into a common model. Unlike collaboration, integration relies on participants sharing their knowledge and expertise.

Compared to information integration, that involves merging information having different schemas and models knowledge integration focuses more on synthesizing the understanding of a given subject from different perspectives.

Knowledge integration can also be studied as the process of incorporating new information into a model of existing knowledge with a multidisciplinary or interdisciplinary approach. It is a measure of interaction and contribution between existing knowledge and new information.

Basically, Knowledge integration is a multidisciplinary process that involves three closely related components; knowledge management, knowledge synthesis, and knowledge translation. Knowledge management is the process of obtaining, organizing, and displaying evolving evidence, such as publications. Knowledge management is well described as:

"Knowledge management is a conscious strategy for moving the right knowledge to the right people at the right time to assist sharing and enabling the information to be translated into action to improve the organizational performance." (O'Dell & Grayson 1997)

Knowledge synthesis is the process of conducting systematic reviews using common rules. For example using research results to combine information for decision analysis and modelling. Knowledge translation refers to the engagement of stakeholders to influence policy, recommendations and guidelines, in order to realize research results and put integrated knowledge into action.

For a developing region knowledge integration plays a significant role in the growth and development of the society and collaboration is directly related to the effectiveness in playing this role.

Implementing knowledge integration presents various challenges. Some of these challenges are due to the tensions because of competitions, or because of the vagueness of the objectives of integration processes. Research, natural resource management, development, self-determination, and advocating for indigenous rights have all been logical drivers of efforts to integrate knowledge. Knowledge integration, at some occasions, has only become a common trend in natural resource management (Wohling 2009) that amounts to little more than a box-ticking exercise. Nowadays, the general picture resembles a knowledge integration-in-practice that has not been extensively debated academically (Castillo 2009).

COLLABORATION IN HIGHER EDUCATION

As a sector, higher education has expanded both in terms of the varieties of programs it offers and also in terms of the number of students enrolled. Higher education should be evaluated in with different perspectives, not only because it leads to economic development, but also from the point of view of the transformation that would lead to the creation of a more civil society. Now, more countries are considering the importance for their students to have experience in different countries and to have global consciousness in order for them to compete in today’s competitive international environment and world economy.
Despite the dramatic expansion in institutions, programs, and student enrolment during the past few decades, higher education in developing countries is falling behind the needs of students, employers, and society in general. Therefore, reform in higher education is essential in the developing countries to the eventual success of the social, political, and economic transformation underway in the world today and must be given priority. This reform must be accompanied with a sound and a comprehensive evaluation.

Experiences with evaluation in higher education institutions have historically not been widespread. Simple evaluation methods that in themselves may motivate participants (faculty as well as students) to engage in enhancement of teaching and learning are needed: quality improvement will result from involvement, not from inspection. Internationalisation of universities is another dimension that adds new challenges in today’s global higher education system and the transformation of academia. This dimension shall also be considered in the context of an overall evaluation and implementation of new strategies.

Creation of knowledge plays an important role in achieving advancement in a field and improving quality, yet in terms of enhancing quality it becomes more essential and effective when this knowledge transfer is provided. The best way to provide knowledge transfer is through collaboration.

**INTER-INSTITUTIONAL COLLABORATION**

Collaboration efforts are needed between institutions not only to set up the standards that would improve the quality in higher education, but also to share experiences and transfer knowledge among higher education institutions (Al-Shanableh, 2011). Collective work between institutions to share new technologies, applications and methods would provide development and enhance knowledge integration.

Collaboration between higher education institutions will allow increasing the ability to work together making advantages of each other’s strength and benefit from weaknesses, provides mobility of highly equipped faculty and researchers, transfer of knowledge and contribution to a common vision among these institutions to improve the quality of education, research and innovation.

Being one of the major missions of a higher education institute, scientific research which also help to raise intellectual interest of students and develop their academic character, should be encouraged at all levels, particularly at the graduate level. A significant research carried out at some reputable institute, for example, may become a driving force in enhancing quality when shared with another institution.

Interdisciplinary and inter-institutional collaboration can be in different fields; research, exchange of faculty, exchange of students, jointly organised conferences and symposia, joint programmes, and others. Among which cooperation in research and mobility of faculty may be considered as the most vital in terms of quality and knowledge integration enhancement. Knowing that research, in particular, has become a stronger driver than student mobility in the context of internationalisation of institutions.

Two examples of interdisciplinary and inter-institutional collaboration from Near East University (NEU); the first is an example of interdisciplinary collaboration between the Faculty of Dentistry and the Department of Mechanical Engineering at NEU, the second example is an inter-institutional collaboration between Near East University - Nicosia, North Cyprus and Middle East Technical University – Ankara, Turkey.

The first example was in the context of a research carried out for a PhD dissertation on Restorative Dentistry under the name of “Evaluation of Influence of Salivary Contamination During Different Stages on Microshear Bond Strength of Composite Resin Applied With Three Different Adhesive Systems.” The aim of this study was to investigate
the influence of salivary contamination on bond strength of dentin during different application stages of 3 different adhesive systems. Two-step-total-etch adhesive, two-step-self-etch adhesive and one-step-self-etch adhesive were used. In this study, the samples were prepared at the Faculty of Dentistry, the test setup was designed and produced by the Department of Mechanical Engineering staff and the tests were conducted in the Mechanical Engineering Laboratory.

The second example was a result of a protocol signed between the Department of Mechanical Engineering at NEU, North Cyprus and the Department of Biotechnology at METU, Turkey. The protocol stipulated the role and duties of each party and also stated the tools and means for transfer of knowledge and information. The project was funded by TÜBİTAK (The Scientific & Technological Research Council in Turkey). Two experiments were conducted under this project; the first, Preparation and Degradation of Mechanical Properties of PLLA/HAP Composite for Bone Repair Implants and the second, Preparation and Degradation of PLLA/PLGA/HAP Bone Plates.

PLLA/PLGA/HAP pastes (poly(L-lactic acid)/poly(lactic acid-co-glycolic acid)/hydroxyapatite) were prepared at 4°C in dichloromethane. The PLLA:PLGA:HAP ratios were varied to study the influence of composition on properties and on degradation. The samples were processed in a specially designed mold with dog-bone templates at 150°C or to 170°C, and then cured under 25 tones. The samples were aged at 37°C in human sera for six weeks and tested to determine the changes in the mechanical properties.

HAP is produced by mixing Ca(NO_3)_2 solution (Ca(NO_3)_2·4H_2O in deionized H_2O) and Na_3PO_4 solution (Na_3PO_4 in deionized H_2O), pH of the mixture is set to 10. Precipitate, obtained by keeping the solution for 24 hours at room temperature, is washed and treated in de-ionized water at 90 – 100°C under atmospheric pressure. n-HA powder is obtained after drying at 80°C.

HAP and PLGA were supplied by METU, PLLA was supplied by NEU. Mold was designed and produced by NEU, while the sample composition was designed by METU. Production, aging and testing were carried out by NEU and scanning Electron microscope and Stereo-micrographs by METU.

This collaborative project resulted in two scientific papers both were presented at international conferences. This project proved to be a good example of the benefits mention earlier; the collaborative research resulted in a knowledge integrated product of two scientific papers and at the same time secured collective funding for the project and other things.

Another NEU example of inter-institutional collaboration is the faculty exchange between NEU and Cairo University- Cairo, Egypt and Concord University-Athens, West Virginia, USA. Two professors from the schools of medicine at the above named universities will join NEU Faculty of Medicine as visiting professors for the academic year 2012-3013. Also, 1-2 professors from NEU are expected to join Concord University during the academic year 2013-2014 as visiting professors. This collaboration would facilitate for the share and transfer of knowledge and experience between these institutes leading to knowledge integration in HE, providing more quality education and better outcome of the process. Consequently, collaboration on the governmental level, collaboration among institutions of higher education, and collaboration between centres and agencies are important for enhancing knowledge integration.

Besides networking on the national and regional levels “as indicated in Figure 1 and Figure 2 (Appendix),” global networking is essential for collaboration and knowledge sharing and transfer “as indicated in Figure 3 (Appendix).” In order to achieve sound collaboration between institutions on the global level we need a solid networking mechanism. The criteria for each institute involved in the network, no matter on the national, regional or global levels, depend on many factors; among which is the capacity to participate in the network, the
quality and quantity of information, infrastructure, benefits of exchanges for research and development, and others. Interdisciplinary and inter-institutional cooperation should create support and coordination and define the nature of mechanism involved. This mechanism should address different issues such as infrastructure, legal aspects, applicability and compatibility, dissemination of wisdom and benefit sharing and also taking into account indigenous and cultural achievements. Scientific research activities require implement exchange mechanisms. It is also necessary for those working on mutual research areas who share the same specialization show a strong solidarity and collaboration. Due to the emerging of dynamic knowledge based economy, public policies and public institutes should adapt their material and human resources to the dynamic development of the knowledge and information society.

Inter-institutional cooperation at national, regional, and global levels shall to be improved in order to achieve our objectives, keeping in mind to safeguard rights and liberties. The social and economic efficiency of public order policies and measures need to be reassessed and improved based on updated inter-institutional and organisational concepts, on diversified methods of cooperation at national, regional, and international level. (Balan et al)

In addition to depending on effective knowledge generation and knowledge management when assignments involve multiple institutions, other knowledge management difficulties arise for such inter-institutional collaboration. These difficulties arise from the need to standardize and synthesize knowledge from multiple sources, and also from the necessity to provide proper protections for confidential and personal information.

Some of the main challenges in a knowledge-intensive environment are proved to be non-technical: social and legal issues of privacy, intellectual property, constructing precise but flexible contracts and agreements, and assuring continued support by corporate management and legal departments.

The handling and management of collaborative knowledge addresses three dimensions: the source of knowledge, the nature of the knowledge, and the use, application, and impact of the knowledge, particularly its effect on collaboration.

In [1] Alexander, considers action-based trust as a form of knowledge-based trust and discuss the relevance of time with regard to the establishment and maintenance of trust in a collaboration. Particularly collaborative settings which are facilitated by shared information systems are in need of action based and knowledge-based trust. It has therefore to be considered essential especially for the integration of knowledge from different organizations in a collaboration to ensure the exchange of trust-building information through interfaces.

The collaboration based innovation in industry, academia, and other areas is an effective way to enhance the innovative task. Relations can be expanded to more than bilateral and the complex dynamic process can produce a wide range of possible evolutionary directions. Since an essential feature of innovation is creation and knowledge integration, considering different perspectives knowledge will be integrated at knowledge-flow and organizational levels.

Culture, traditions, politics, and law make up the social context of the knowledge integration. According to some scholars, the practices of knowledge cohesion shall be in close contact with culture. According to Garibaldi and Turner (2004) the concept of“cultural keystone species” are explicit in a culture because of their value for food, material, or medicine. They tell how cultural keystones like the Western red-cedar (Thuja plicata) are important to coastal First Peoples of British Columbia as a vehicle for conservation and restoration as well as treaty and land rights negotiations. Cultural advisors in the White Mountain Apache community were interviewed regarding their views on
wetland restoration, and as a result of the interviews, Long et al.’s (2011) suggest that cultural traditions can guide ecological restoration efforts.

Indeed, indigenous peoples’ heritage, culture, diversity, wisdom and traditions have to be addressed, individually or collectively, and taken into consideration when designing sustainable systems of integrating knowledge and solutions, especially in social and ecological sciences.

CONCLUSION

To achieve development and perfection in scientific outcome, in developing nations worldwide, collaborative research should be encouraged and supported. Countries should share knowledge, increase communication and have agreements in between institutions if they want to invest in research. This effort would result in exchanging knowledge, and cooperation agreements among institutions, scientific reference and documents, and this would require intensifying communication, sharing participations in specialized scientific symposia, conducting collaborative research, and benefiting collectively from funding sources.

In order to achieve more collaborative knowledge, the concept of integrating knowledge should be debated on academic level. This debate should not be limited to universities and other higher education institutions. Different platforms must be included in the debate such that it covers expertise from all aspects of life. The outcome should consider all factors that may contribute to, or affect knowledge integration in the context of creating new standards that govern the knowledge management, knowledge transfer and sharing. Keeping in mind that to create new standards and collaborative systems related to higher education, different experiences must be evaluated, benefiting from their strength and avoid their weaknesses eventually making systems more efficient and internationally competitive. Meanwhile, and maybe more crucial is to maintain “our own” experience, indigenous and local culture and tradition that carry more sustainable features and probably be more adequate, especially in social and ecological sciences.

These platforms must lead to the creation of local and regional “knowledge sharing & innovation” centres that are interconnected to provide the transfer of knowledge and expertise and should be based on trust and cooperation. Meanwhile, they should be able to communicate and cooperate with other centres, specifically in the developing countries and globally in the rest of the World, providing that more collaborative knowledge is achieved.

Implementing of such project would require the use of grid technology that can be defined as a software infrastructure which enables flexible, secure and coordinated resource sharing among individuals and institutions. This grid technology requires the establishment of a reliable system on the legal, the hardware and the software levels. On the legal level, protocols should be prepared to provide legal regulations and rules that insure confidentiality, as well as ethical data and security constraints. The implementation of such a system may face different challenges, yet as for all emerging systems, these challenges and difficulties may be eliminated, if not totally at least to some acceptable extent, by determination and by making use of “expert systems” and qualified staff, and by true collaboration between institutions and governments.

Technological challenges, including interoperability are easier to handle when compared with political, economical and ethical issues that must be addressed, debated and agreed upon before launching such a project.

Indeed collaboration can add positively to knowledge integration. All we need is a comprehensive academic debate, determination and commitment to carry out our duties and
to do our homework. The future can be predicted as bright one if we all cooperate with faith, sincerity and hard working.

REFERENCES

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