GUEST EDITORS' INTRODUCTION

SPECIAL ISSUE "SITUATING TRANSFER THROUGH THE DESIGN OF ADAPTABLE CURRICULA, METHODOLOGIES, AND TECHNOLOGIES"

In educational circles, we often speak of "transfer" to mean "transfer of learning"—students' ability to apply knowledge from one situation to another. Transfer can also refer to the applicability of curricula, research methodologies, and technologies from one context to another. However, transfer, even when attempted, does not always occur. Whether learning, curricula, methods, or technologies transfer or not depends on many factors including but not limited to local infrastructure, teacher and student competencies, attitudes, culture and language.

Issues of transfer are particularly salient in emerging economy contexts. Many of the theories and technologies for education emerge from the developed world. How can the developing world adopt these theories and technologies? How can they be applied and will they be as effective under such disparate circumstances? How can researchers and educators from emerging economies contribute to the discourse on education theories? How can they contribute to the development of educational technologies?

This special issue features papers that attempt to answer some of these questions. It builds on the outcomes of the 1st International Workshop on ICT Trends in Emerging Economies held in conjunction with the International Conference on Computers in Education 2012. It includes invited papers from experts in the field. It also includes contributed papers that fall under two categories: the ways in which research informs practice and the ways in which practice informs policies, strategies, and innovation.

Papers that fall under the former category are theoretically grounded, conceptual, or empirical. They help us form a better understanding of how innovation takes place, recent trends and issues in the management of technological and organizational change, and the socio-economic consequences of innovation. Papers in the latter category highlight some factors that need to be considered when adopting, adapting and scaling innovations in developing countries.

Jones, Chang and Kinshuk's *Pecunia - A Life Simulation Game for Finance Education* simulates various situations requiring different financial decisions. Pecunia, the game world, is developed on the open-source platform OpenSim. Pecunia investigates whether the developed game will result in an increase in the player's knowledge of financial concepts, whether the player's attitudes toward games in general will influence his/her attitude to playing, whether the game's usability will affect the player's acceptance of the game, whether freedom in the game will encourage the player, whether

both genders will enjoy the game and whether prior gaming experience will affect game acceptance. The financial rules can be changed. Hence, the game can be easily scaled and adapted to suit the different needs of various individuals, groups and countries.

From a cultural perspective, Blanchard and Mizoguchi's *Designing Culturally-Aware Tutoring Systems with MAUOC, The More Advanced Upper Ontology of Culture* introduces the More Advanced Upper Ontology of Culture (MAUOC), a framework that researchers can use to design and develop culturally-aware tutoring systems. The authors created this framework to respond to findings that the technology-enhanced learning solutions tend to be developed in Western countries and are directed at Western audiences. When attempts are made to transfer these systems to other contexts, they may not adapt well to the local cultural context. MAUOC provides researchers with a way of thinking about the design of their systems so that they are respectful to local cultures while still maintaining educational efficiency.

Similarly, the paper by Rodrigo, Sugay, Agapito and Reyes, Jr., *Challenges to Transferring Western Field Research Materials and Methods to a Developing World Context,* present challenges which need to be considered when transferring systems and field study methodologies to developing countries. Derived from various research and practice studies, the authors presented five challenges which must be addressed during the transfer process: technology adoption, school support, infrastructure, student culture, and force majeure. Among these factors, the authors argued that cultural factors need to be given more attention when transferring data collection field methods to wider and more diverse contexts.

Another aspect of culture investigated is the role of moderators in Learning Management Systems. Moses, Wan Ali and Krauss present design factors that can be adopted or adapted for more effective online moderation in *Cause Analysis of Learning Management System: Role of Moderator in Improving Student Performance*. They describe the different ways in which facilitators support transfer of learning within an online learning management system. Through interviews with three experienced facilitators, the authors extend the Human Performance Technology model by identifying ways in which facilitators can foster greater learning among students: providing adequate support, rewards, and performance specification and reinforcement; demonstrating adequate skills and knowledge; preparing the environment; and publicizing the usefulness of their technology choices.

Having considered challenges affecting successful transfer and design factors, we now consider the crucial need to prepare pre-service teachers to integrate technological tools into their classroom teaching practices within their unique contexts.

Curriculum and Methodology

Tan's Transfer and Scaling of Knowledge Building Practices: A Journey from Diffusion Approach to Situative Knowledge Creation Community Approach presents efforts and lessons learned spanning 12 years in bringing knowledge building practices into Singaporean classrooms and scaling up related pedagogical practices to more classrooms.

The journey began with a linear diffusion approach, subsequently evolving into a collaborative learning approach (involving both researchers and teachers in co-designing the lessons) and later, a situative knowledge building community approach. The latter approach encourages teachers to assume agency to increase the effectiveness of pedagogical practices in their classrooms, and to share these practices to other classrooms and schools. Teacher learning is enhanced by helping teachers to reflect and create knowledge artifacts which capture the progress of their own knowledge building practices. The researchers look forward to possible transfer and scaling of these practices using various approaches to suit diverse contextual needs.

In *Developing Technological Pedagogical and Content Knowledge in Using Computerized Science Laboratory Environment: An Arrangement for Science Teacher Education Program*, Srisawasdi regards Technological Pedagogical and Content Knowledge (TPACK) as the reference framework to educate and equip teacher education students and pre-service teachers with the necessary 21st century skills. This article presents an example of how a science teacher education program is designed, with details on the alignment of courses for student science teacher preparation in the learning of how to use microcomputer-based laboratory and computer simulation to enhance inquiry-based science learning. Evidence of student science teachers' growth in relation to TPACK is presented for confirming the effectiveness of the design.

These studies have highlighted trends and issues in teacher professional development and possibly some areas for change in its design and management. We now move on to how technology can be used to scaffold learning.

Technology

McCaffrey, Krishnamurty and Lin's *Cahoots: A Software Platform for Enhancing Innovation and Facilitating Situation Transfer,* uses an ergosemantic visualization method to help learners model open and closed problems and the search for solutions. *Cahoots* breaks problem-solving into goals, resources, and interactions and visualizing the grammar for problem solving has resulted in admirably positive results. Two examples illustrating how *Cahoots* scaffolds analogical search and transfers highlight its intuitiveness and robustness at modeling and problem-solving.

In summary, the ecosystems papers have highlighted how the design of individual, collaborative and lifelong learning are influenced by various personal, organizational, communal, country-specific and most importantly, cultural contexts. Consequently, when designing and transferring curriculum, methodologies and technologies, especially from the Western Worlds to Emerging Economies, adaptations to these subjective aspects must be carefully designed. Taking into account differences and changes in management, technology, socio-economy and most importantly culture is more likely to result in creation of innovations and not merely the effective adoption, adaptation and scaling of innovations.

The study from Singapore has provided many examples of how research in curriculum and methodology informs practice and how practice informs policies,

strategies, and innovation. Tan's curriculum and methodology refined over 12 years of knowledge building efforts reflect lessons learned from three approaches. While the linear diffusion and collaborative learning approaches each has its strengths, the situative community knowledge building approach regards teacher agency as the primary force driving teacher professional self-development. Teacher agency is found to be more effective in motivating teachers to self-reflect on their own knowledge building growth and subsequently in motivating teachers to create knowledge artifacts and improve their own pedagogical practices. As they share practices which worked in their classrooms to other classrooms and schools, it is hoped that transfer and scaling to different contextual needs will bear similar positive results, inform research and create new innovations. The example from Thailand has provided specific examples of how TPACK can be applied to design programs to train science teachers to use microcomputer-based laboratories and computer simulation to enhance inquiry-based science learning. Juxtaposing these two studies can reveal interesting areas for more focused teacher and program development.

The technological study has presented a creative software platform for improving the modeling of problems, the search for analogous solutions through an ergosemantic visualization method and examples of how innovation and situational transfer can be scaffolded.

In conclusion, we aimed to create awareness and better understanding for further innovative research and practice by identifying the socio-technico-economic challenges when transferring to different contexts. It is our hope that this special issue will widen the overall scope and impact of knowledge creation, transfer, and adaptation in wider communities.

Last but not least, we would like to thank the authors, especially our distinguished invited authors for their contribution, our reviewers for their comments and suggestions and the Editorial Board of RPTEL for recognizing the potential of this theme and for supporting this special issue's objectives.

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Guest Editors