the iafor

journal of education

Volume 2 - Issue 1 - Winter 2014

Editor: Bernard Montoneri

ISSN: 2187-0594

iafor

The IAFOR Journal of Education
Volume 2 – Issue 1 – Winter 2014

IAFOR Publications
Executive Editor:
Joseph Haldane
The International Academic Forum

The IAFOR Journal of Education
Editor:
Bernard Montoneri, Providence University, Taiwan

Associate Editors:
Cassandra Atherton, Alfred Deakin Research Institute, Australia
Beena Giridharan, Curtin University, Sarawak Malaysia
Askhat F. Safiullin, Chonbuk National University, South Korea

Published by The International Academic Forum (IAFOR), Japan
IAFOR Publications. Sakae 1-16-26-201, Naka-ward, Aichi, Japan 460-0008

Executive Editor, IAFOR Publications: Joseph Haldane
Design: Bernard Montoneri

The IAFOR Journal of Education
Volume 2 – Issue 1 – Winter 2014

IAFOR Publications © Copyright 2014
ISSN: 2187-0594 (Online) http://iafor.org/educationjournal.html

Cover image by Ajari/Flickr
http://www.flickr.com/photos/ajari/3898575530/in/photostream/
http://creativecommons.org/licenses/by/2.0/

Notes on Contributors

Henning Breuer is founder of “uxberlin – innovation consulting" (www.uxberlin.com) and professor of business and media psychology at the university of applied sciences for media, communication and management in Berlin, Germany. His focal point of interest is the creation of sustainable value. His research and consulting work currently focuses on innovation strategy and organizational learning, corporate venturing and business modeling and human-centered design. As an adjunct researcher at Waseda University Tokyo he is also creating concepts and prototypes for learner-centered design. For Deutsche Telekom set up a project field for User Driven Innovation as research and innovation director. Before, he used to work at consulting companies, at the University of Chile, and at the University for Applied Sciences Potsdam.

Heinrich Schwarz is owner of Schwarz Innovation, a people centric strategy consultancy based in Hamburg, Germany, and lecturer on business anthropology. In the past he worked as management consultant in Denmark and as academic faculty and ethnographic research consultant in the US. He holds a PhD in science and technology studies from M.I.T and other degrees in social and cultural studies and psychology.

Kristina Feller works as a scientific associate at User Driven Innovation, a user-centered unit of Telekom Innovation Laboratories in Berlin. The User Driven Innovation supports user-centric product development by developing and applying innovative user research tools along the entire innovation process. Kristina Fellers research and work focuses on the early phase of the innovation process - ethnographic exploration and idea creation based on the ethnographic insights. She holds a Master degree in Intercultural Communication and a BA in Social and Cultural Studies obtained at the European University Viadrina. Previous to her role as a research assistant Kristina Feller worked as a student assistant at Telekom Innovation Laboratories as well as at European University Viadrina.

Mitsuji Matsumoto joined NTT Labs in 1970 and worked on terminal architecture, design and international standardization for facsimile, telematics, and multimedia systems. In 1994 he received the Doctor's Degree of Engineering from Waseda University, Tokyo Japan. In 1996, he joined Waseda University as a Professor. From 2000-2004 he was Vice Chairman of ITU-T SG16 Multimedia. Recently he leads standardization in accessibility for persons with disabilities, and education about standards. He is a member of ITU-T Academia, IEEE Senior member, IET and a member of IEICE and IIEEJ (former President).

Esther Smidt is an Assistant Professor of TESOL in the Department of Languages and Cultures at West Chester University. Her research interests include distance education, computer-assisted language learning, immigrant identities, immigrant education, and second language teacher education.

Jennifer Bunk is an Associate Professor of Psychology at West Chester University. She teaches online and hybrid courses in industrial/organizational psychology and research methods. She is interested in understanding distance education through a psychological lens and also researches workplace stress, workplace incivility, and work-family conflict.

Bridget McGrory is currently a second year graduate student at West Chester University pursuing a Masters of Arts in the Industrial/Organizational Psychology program. She received a B.S. in Psychology from the University of Pittsburgh. Her research interests include distance education, workplace incivility and transformational leadership.

Rui Li is the Executive Director of Distance Education and Instructional Design at West Chester University. She has taught online/blended courses both nationally and internationally and her research focuses on distance education and technology as cognitive tools.

Tanya Gatenby is an Associate Professor and Masters of Public Health and Health Care Management Track Coordinator at West Chester University. Her research focuses on distance education, health and wellness, underserved populations and health care access.

Kiran Hashmi has been a Master trainer, a teacher educator and researcher for a decade. She is working as a Senior Lecturer at Notre Dame Institute of Education, Karachi, Pakistan. She is well known for her teaching skills and research contribution. She has a bright academic and professional career. Currently she is pursuing her doctoral study in Psychodynamics of Leadership, the first of its kind in Pakistan. Her research papers have been published at national and international levels.

Kent Fredholm lives in Sweden and has a background as a teacher of Swedish, Italian, French, Spanish, Latin and Mandarin Chinese, teaching pupils between ages 12 and 75 for the last decade. He is currently performing PhD. studies in Spanish at the Department of Language Education of Stockholm University. His current studies concentrate on the use of information and communication technology among pupils learning Spanish as a foreign language, with particular focus on digitalised writing strategies, grammar learning and online translation. Earlier studies and interests have concerned symbolism in Italian and French 20th century literature and pupils' motivation for foreign language studies.

Russell Butson is a senior lecturer in higher education/educational technology. His research is focused on institutional learning that is the learning that takes place within professional contexts, particularly within the university setting. How and why do students and faculty acquire the skills and knowledge needed to advance their professional goals? Information Communication Technologies (ICT) is a core part of this learning context and therefore the development of discipline-based ICT literacy offers a new perspective into the learning process.

KwongNui Sim is a Ph.D. candidate in higher education. Her research is focused on ICT (Information Communication Technologies) beliefs and practices held by students as they undertake their tertiary education. What is the role of ICT among undergraduate students in their daily study practice? How does ICT play a role in postgraduate students' day-to-day research practice? ICT literacy could be a significant aspect in today's tertiary learning context. Therefore, studies on students' ICT literacy offer a new perspective in the emerging area of research on ICT utilisation and integration in tertiary education.

Dr. Marilyn L. Balmeo is currently the Department Head for Professional Education in the School of Teacher Education, Saint Louis University, Philippines. She had been teaching for 18 years in the tertiary level and had been a research adviser both in the undergraduate and graduate levels in the University. She had been able to present several of her research works in varied national and international forum and conventions. She is also a trainer and speaker in education-related topics and activities.

Allan B. Castro is currently a fourth year student majoring in Mathematics Education under the School of Teacher Education of Saint Louis University, Baguio City, Philippines. He has been assisting various student researchers in his college in matters of interpreting research results and organizing research data. Outside the academic field, he is the president of the student council of Saint Louis University and is a debater for SLU Debate Society.

Kristine Joy T. Caplis is a Special Education graduate under the School of Teacher Education of Saint Louis University, Baguio City, Philippines. She is currently working as an educator at Northridge Academy, Inc., Baguio City.

Kizzylenn N. Camba is a Special Education graduate under the School of Teacher Education of Saint Louis University, Baguio City, Philippines. She is currently working as an educator at Northridge Academy, Inc., Baguio City.

Jahziel Gillan M. Cruz has been a Special Education student of the School of Teacher Education of Saint Louis University, Baguio City, Philippines.

Marion G. Orap is a fourth year special education student of the School of Teacher Education of Saint Louis University, Baguio City, Philippines. Currently, he is in his practicum phase for his chosen program.

Joroma Sol T. Cabutotan is a Special Education graduate under the School of Teacher Education of Saint Louis University, Baguio City, Philippines.

Mariyana Ivanova Ilieva is from Bulgaria, Sofia city. She obtained her PhD in 2012 at Sofia University St.Kliment Ohridski, Faculty of Education, code of professional field - Pedagogy, Doctoral programme - History of The pedagogy and the Bulgarian education. She graduated from the Sofia University St. Kliment Ohridski, Faculty of History in 2005 with Bachelor's Degree in History, specialization: History of Byzantium and the Balkans. She also completed a Master's Degree in Education, specialization: Management of education from the Sofia University St. Kliment Ohridski, Faculty of Education in 2002. Her career at Sofia University St. Kliment Ohridski started in 2008. She is currently an assistant professor at the University St. Kliment Ohridski, Faculty of Education. She teaches History of Pedagogy, History of Bulgarian Education, History of social work, Alternative Education - history and contemporary. Ilieva has published the research papers and articles about Historical pedagogy. Her research interest include European and Bulgarian history, Historical pedagogy, The Philosophy of education, Pedagogic innovations, Research and development methodologies, E-learning. She participated in several

national, an international scientific forums and conferences about Education. She also participated in several national projects. Ilieva is currently participant in the project Development of the research potential of University of Sofia in the field of e-learning is funded by the Operational Programme for Human Resource Development of the European Social Fund.

Journal of Education Editors

Editor: Dr Bernard Montoneri

Providence University, Taiwan

Bernard Montoneri earned his Ph.D. (African, Arab, and Asian Words; History, Languages, Literature) and his BA in Chinese from the University of Provence, Aix-Marseille I, France. He is currently an Associate Professor at Providence University, Taichung, Taiwan. He teaches Literature (European, Children, American, and British) and languages (French, English, and Italian). Bernard has published more than 32 journal and conference papers, 5 books and has obtained 16 teaching or research projects. His research interests include European literature, children literature, English writing, automated scoring systems, teaching and learning evaluation, data envelopment analysis, networking, and teaching methods. He is a reviewer for top academic journals such as Review of Educational Research (impact factor: 3.169; rank: 3 out of 203 in Education & Educational Research), American Educational Research Journal (2.393), Teaching and Teacher Education (1.322), and European journal of Operational Research (1.815). He is linked to around 22 million professionals on LinkedIn.

Associate Editor: Dr Cassandra Atherton

Alfred Deakin Research Institute, Australia

Cassandra Atherton is a senior lecturer at Deakin University. She has written several articles on academic public intellectuals for international journals and is currently writing a book, Wise Guys, on the changing role of the public intellectual in academe, based on her interviews with Noam Chomsky, Harold Bloom, Camille Paglia, Stephen Greenblatt and others. A book interviews with these American public intellectuals, entitled In So Many Words, is forthcoming from Australian Scholarly Press. She has written a critical monograph, a novel and a book of poetry.

Associate Editor: Dr Beena Giridharan

Curtin University, Sarawak Malaysia

Beena Giridharan is the Dean, Teaching and Learning at Curtin University, Sarawak. She is responsible for strategic and academic leadership and continuous improvement in teaching and learning across all programs offered by Curtin Sarawak. She attained a doctoral degree in Applied Linguistics and Education from Curtin University, Western Australia. Her Master's degree (first class) is in English Language and Literature, and her Bachelor's degree in Science (first class). She has been a fellow of the Higher Education Research and Development Society of Australasia (HERDSA) since 2006. She won the 2006 Carrick Australian Award for University Teaching and the Curtin Excellence in Teaching and Innovation award in 2006. As a member of an OLT (Office of Learning and Teaching, Australia) funded project entitled 'Learning Without Borders', she has investigated leadership roles in Transnational Education (TNE) and internationalization of curriculum. She is a reviewer for the Pertanika-Journal of Social Sciences and for the Higher Education Teaching and Learning Journal. She has been an invited speaker at several national conferences. Her research interests include vocabulary acquisition in English as a second language, higher education practices, transnational education, work-integrated learning, and ethno-linguistic studies in indigenous communities. She was a visiting professor at the Virginia Commonwealth University, Richmond, Virginia, USA, between 2007 and 2008.

Associate Editor: Dr Askhat F. Safiullin

Chonbuk National University, South Korea

Askhat F. Safiullin earned his Ph.D. (International Studies) and his BA in International Relation from the Yonsei University, Seoul, South Korea. He is currently an Adjunct Professor at Chonbuk National University, Jeonju, South Korea and Adjunct Professor at the Graduate School of International Studies at Yonsei University, Seoul. South Korea.

He is also a Visiting Professor at Sonkyunkwan University, Seoul, South Korea. He teaches a wide spectrum of subjects in International Relations ranging from Diplomacy and Global Governance to the Korean Research Design.

Askhat has published a number of journal and conference papers and a chapter in a book. His research interests include International Relations and related spheres, and effective teaching and learning methods.

Table of Contents

Introduction

It is my great pleasure and honour to introduce Volume 2 of IAFOR Journal of Education. This first issue is mostly a selection of papers submitted during:

1. The fourth annual Asian Conference on Education (ACE 2012), 'Learning and Teaching Through Transformative Spaces', held in Osaka in October 2012. ACE attracted 450 registrants and invited speakers from more than 40 countries; it was IAFOR's biggest conference to date. 130 papers were submitted online in December 2012.
2. The inaugural European Conference on Education (ECE 2013). The First European Conference on Education was held alongside the Inaugural European Conference on Technology in the Classroom (ECTC 2013). The two conferences were held in Brighton, UK, in July 2013. The event attracted 350 delegates from over forty countries.

The first paper is co-authored by Henning Breuer, Heinrich Schwarz, Kristina Feller, and Mitsuji Matsumoto. Breuer et al. identify a potential value innovation by using a recent innovation project in higher education in Germany. The project had the goal to identify potential new learner-centered tools and services for university students with high business potential. Three different research methods (Ethnography, desk research, and blue ocean market analysis) were applied and combined to achieve a broader and deeper understanding of the topic. Breuer et al. show that only in combination can the derived ideas create a new market and meet customers' needs at the same time.

The second paper by Esther Smidt, Jennifer Bunk, Bridget McGrory, Rui Li, and Tanya Gatenby propose to understand the experience of online courses from students' perspectives. They apply a qualitative method in a specific context, namely that of a Mid-Atlantic mid-sized state university, and translate their findings into practical recommendations for instructors. Smidt et al. notably demonstrate that online courses have heavy workloads requiring student autonomy; students tend

to complain about the lack of instructor support and about the lack of interaction, whether instructor-student or student-student.

Kiran Hashmi studies Human Resource Management and Development (HRMD) strategies and their effect on teachers' efficiency within the Catholic Board of Education (CBE) schools of Pakistan whose teachers are graduates in educational leadership courses from a private teacher education institutes in Karachi. The paper endeavored to build a simple theoretical and conceptual framework where the effectiveness of HRMD strategies in educational leadership were studied to explore their impact on enhancing teachers' efficiency.

The next paper, written by Kent Fredholm, conducts a qualitative survey mapping upper secondary school pupils' attitudes towards the Information and Communications Technology (ICT) use for learning Spanish language. His study looks at ICT use for grammar practice. A group of pupils completed lesson diaries, reflecting upon web-based grammar exercises, comparing them to paper-based exercises, and a questionnaire survey on general attitudes towards ICT in language learning. Results show that the majority of participating pupils ask for a greater variety of tasks and see a need also for traditional forms of grammar practice, especially written exercises which give time to reflect upon grammar, syntax and vocabulary. They want ICT use to be an option, not a constraint.

The paper by Bernard Montoneri uses student evaluation of teachers to design a teaching improvement matrix based on teaching efficiency and performance by combining management matrix and data envelopment analysis (DEA). This matrix is designed to formulate suggestions to improve teaching. The research sample consists of 42 classes of freshmen following a course of English in Taiwan. The empirical findings show that proposed model can distribute all the evaluated classes into 4 quadrants depending on their performance and efficiency, identify the importance of each performance indicator, and suggest the improvement direction in different

quadrants for all the evaluated classes. A study case of one inefficient class is presented in order to demonstrate the proposed model utility and feasibility.

The next paper is co-authored by KwongNui Sim and Russell Butson. They examine the degree to which twenty two undergraduate students used their personal computers to support their academic study. The students were selected based on their responses to a questionnaire aimed at gauging their degree of computer skill. Computer activity data was harvested from the personal computers of eighteen students and video footage of the students personal study sessions was gathered from a further four students. They conclude that for this group of students computers played an important role in their day to day lives, but the degree to which they were used in their academic study was lower than we had expected.

The study co-authored by Marilyn L. Balmeo, Allan B. Castro, Kristine Joy T. Caplis, Kizzylenn N. Camba, Jahziel Gillian M. Cruz, Marion G. Orap, and Joroma Sol T. Cabutotan applies Stimulus-Organism-Response theory to determine the perceived level of importance and perceived level of satisfaction of 399 college students in Saint Louis University, Baguio City, Philippines. Only 6 out of the 16 areas of the learning environment were identified with an existing significant relationship between respondents' perceived level of importance and level of satisfaction, that is, guidance office, computer laboratory, science laboratory, campus security, clinic services, and janitorial services.

Finally, this issue contains a novelty: a section entitled "Key educational scholars". Mariyana Ivanova Ilieva offers a rigorous summary of Geraskov's theories and her paper is a fascinating addition to the journal. Mikhail Geraskov (1874–1957) was an eminent Bulgarian educator and extraordinary professor. He developed the scientific foundations of didactics and methodology of training. His work contributed a lot to the development of the Bulgarian pedagogy.

Please note that we welcome original research papers in the field of education submitted by teachers, scholars, and education professionals. They may send their manuscript even though they did not participate to one of the conferences held by IAFOR. We also welcome book reviews, reviews of the literature in the field, and contributions introducing key educational scholars. The next issue scheduled for August 15, 2014 will also be a selection of papers submitted during the above mentioned conferences.

IAFOR publications are freely accessible on the website (Open Access). Moreover, there is no publication fee for authors. Please find the guidelines at this end of this issue. Follow the new guide for authors if you wish to submit your paper. Finally, do not hesitate to join us on LinkedIn via the group entitled *IAFOR journal of Education*.

Best regards,

Bernard Montoneri

Value Innovation in Learner-Centered Design. How to Develop Valuable Learning Tools.

Henning Breuer, Heinrich Schwarz, Kristina Feller, Mitsuji Matsumoto

Abstract

This paper shows how to address technological, cultural and social transformations with empirically grounded innovation. Areas in transition such as higher education and learning techniques today bring about new needs and opportunities for innovative tools and services. But how do we find these tools? The paper argues for using a strategy of (user) value innovation that creatively combines ethnographic methods with strategic industry analysis. By focusing on unmet and emerging needs ethnographic research identifies learner values, needs and challenges but does not determine solutions. Blue-ocean strategy tools can identify new opportunities that alter existing offerings but give weak guidance on what will be most relevant to users. The triangulation of both is illustrated through an innovation project in higher education.

Keywords: User needs and values; Innovation, learner-centered design; Ethnography; Blue ocean strategy; Triangulation.

Introduction

The reality of university students is in transition. New rules and regulations govern their education. Expectations from industry and society and their own self-image change while emerging digital tools uproot time-tested methods of studying. In Europe, the Bologna process fostering comparability in educational standards and ensuring quality of qualifications is only one visible cornerstone of substantial changes driven by trends such as globalization, mobile digitalization, and the knowledge economy. All stakeholders are being affected: Far from their old image of ivory towers, universities struggle to cope with the mass inrush of students. Still holding on to the Humboldtian model of unity between research and teaching, teachers are torn between their own scientific curiosity within an overwhelming body of knowledge and the demand to deliver innovative approaches to teaching and learning. Students are often overstrained by requirements resembling those of corporate managers but without having the resources and tools that professionals use. The scope and multitude of these transformations explain why educational technologies have struggled to keep up with providing the best potential support to students and professors. All this demonstrates the need for innovative tools and services outlining a new field for innovation in the higher education domain. But how can we support learners in dealing with the transformation in the educational systems and media landscapes? How can we grasp and specify opportunities for innovation in such a transitory field?

While numerous ways have been proposed to generate ideas at the fuzzy front end of innovation management and to position new products in a market, what is lacking is a consistent perspective on the theoretical and operational links between them. We suggest that the notion of value may provide such a theoretical perspective and a consistent anchor for the different activities involved in innovation. Our argument is based on the assumption that it is the purpose of business to create value for people and society. What is of value to individuals and to cultures, however, changes in eras and areas of transformation, like those currently taking place in domains like the financial

systems or higher education. A profound understanding of what is of value at a given historical moment is required to create relevant value propositions and enable sustainable new business. In order to comprehend what is valuable to people we need to understand their needs and their values.

On a theoretical level, we contrast different notions of value and propose an integrated concept of "value innovation" in order to create solutions that are both, valuable and relevant as well as novel, innovative and different. Value innovation combines user-centered with market-strategic approaches in order to create substantial new value for users by serving new or insufficiently fulfilled needs or by supporting inadequately supported values. Ethnographic research is good at identifying learner needs, desires, values and challenges but cannot define which solutions are viable. Blue-ocean strategy techniques are able to identify new opportunities from existing offerings but can only provide weak guidance on what will be truly relevant to users. We illustrate our suggested approach of creatively combining both approaches through a recent innovation project in learner centered design in Germany. The project on learning management tools and services demonstrates how the triangulation of both approaches can help to generate qualified product ideas and maintain focus throughout innovation projects.

Value innovation in learner-centered design: Related works and theory

For laying out our thoughts on value innovation, we build on scholarly work on learner-centered design (e.g., Breuer & Matsumoto, 2011), ethnographic explorations of customer needs, and grounded innovation theorizing (Breuer & Steinhoff, 2010).

A key role is played here by the notion of value. Often in discussions in economic or business contexts the notion of value refers to monetary value or price, what Marx had called exchange value, and is closely linked to profit considerations. Yet in our discussion on value innovation we understand the term "value" to refer to the value that products have or create for the user outside of its exchange value – how valuable it is for them in their use or in their life. There are several

ways, however, in which a product can have value for users (Boztepe, 2003). Of interest here at least three: products can be valuable because they have utility, because they fulfill people's (emotional) needs, or because they support their values (note the distinction here between "values" and "value"). We argue that in order to be successful, value innovation needs to take seriously the latter two meanings of value.

The most common view of value when referring to use, points to a product's utility, its practical purpose and functionality. Accordingly a wide-spread strategy for developing new products is making them useful in new ways or enabling new uses. Along these lines, in the Marxist tradition use value refers to utility and the physical properties of a product in use (Marx, 1962). Marx pointed out that in order to create use value the producer had to imagine what is useful to people and build that into the product. This imagining of usefulness is not a trivial task, however, and Marx did not specify how to determine what is useful, nor did he move beyond a quite practical but somewhat limited understanding of use and usefulness. Baudrillard (1991) later criticized Marx' "naturalistic phantasm" of utility value and complemented the functional dimension with a symbolic dimension of products, which are not only appreciated for what they do but for what they signify, resulting in their sign value. This way Baudrillard emphasized the importance of an understanding of value that includes emotional, social and identity-related aspects beyond purely functional ones.

We believe that a forward-looking understanding of user value needs to move beyond utility and pay attention to people's needs (especially their emotional needs), and values. Although the attention in the business world to customer need fulfillment has been growing in recent years, this perspective is far from a given and there are still a lot of innovation attempts that fail by failing to serve people's needs. Yet while needs are on the radar of companies at least to some degree, the value of supporting customer values and goals has received less attention. A notable exception is Schrage (2012) who demands that product innovation should not only address customers' needs

but also their desired futures – answering the question who customers want or need to become. Therefore it is important to analyze their personal, communal and cultural values. The distinction between needs and values may be worth pointing out. Needs always refer to a lack; they are experienced individually and often emotionally as part of a mental state of being. Values in contrast are directions for human action by pointing to ideals. They do not just belong to one individual, rather they are shared by cultures or communities or social groups, and like needs are not always conscious. Values can motivate and guide needs, preferences, wants and goals of people, and influence the interpretation of needs as well as decision making.

A focus on both needs and values is especially crucial when innovation is planned for domains in transformation, as it is the case in our example of digital learning tools or techniques in higher education. Change, whether it is technological, social or cultural, often changes existing or generates new needs and values. The task and opportunity for value innovation lies in uncovering and addressing these shifting and newly emerging needs and values. In short, a comprehensive notion of value innovations should recognize and include the value created by fulfilling people's emotional needs and by supporting or promoting their values, in particular if applied to shifting everyday practices, social domains or technological fields. In order to involve customers to help create value and to inform the innovation processes companies (or administrations) have employed a range of structured approaches, from traditional market research to advanced user studies.

In recent decades especially ethnographic research has become a preferred approach to see the world from a customer point of view, by studying them in their natural habitat and by using observation and participation as research techniques in addition to conversation and interviews (Atkinson & Hammersley, 1994). The key reason for the growing attention to ethnography in commercial contexts lies in its promise to enable the creation of value for customers and thus ensure the relevancy of new products, services and marketing activities.

The characteristics and specific qualities responsible for the claimed success of ethnographic insights have been widely discussed in the last decade (Sutherland & Denny, 2007; Cefkin, 2009; Jordan, 2002; Mariampolski, 2005; Bockhahn & Schwarz, 2010): Ethnographic insights are seen as more real and more true to the actual way people behave, think and make decisions than other methods. They are seen as going further and deeper than traditional market research in that they capture not just the rational but also the emotional side of people's experience and their interactions with the world. They are seen as less reductionist since they see people as part of social and cultural systems rather than simply as individuals with independent behavior. Finally, ethnographic insights are seen to capture not just behavior and opinions but moreover uncover intangibles such as e.g. needs and problems, fears and hopes, ambitions and values of people. In short, ethnographic research has been established as a source of deep insight into why people behave the way they do and what they intimately wish and need.

Yet such a rich and deep understanding of customers' needs does not per se lead to novel and innovative solutions. But we argue that ethnographic inquiry can encourage new ideas, for one due to its exploratory nature. In contrast to hypothesis-based research or testing methods, the open mind approach of ethnographic practice leaves the door open to findings and observations that are not pre-defined, anticipated or expected and therefore carry the potential to be surprising and new (Lindlof & Taylor, 2002). Yet more importantly ethnographic research can facilitate the development of new solutions in at least four ways: by focusing on unmet needs; by concentrating on latent or hidden needs, values and motives; by aiming at newly emerging needs and desires; and by paying attention to workarounds.

First, focusing on unpacking people's needs that are currently not or not sufficiently met, the product opportunities defined by these needs are by definition not already filled by existing products. If the right offerings were already available to customers these needs would not remain unfulfilled. For reasons ranging from a lack of knowledge, accessibility, availability, to a poor

overall configuration of products, the unmet need indicates openings for an innovative product offering, communication or distribution system.

Second, by uncovering latent or hidden needs, problems and values, ethnography increases the likelihood to discover new or untapped opportunities. If needs or values are hidden they are not easily discovered by traditional research approaches and thus are probably not yet part of the public discourse and general awareness. Invisible cultural patterns and taken for granted cultural beliefs and preferences are unknown to most people. People also do not always have access to the emotional drivers underlying their own decisions; rather motives tend to get rationalized after the event. Finally, people's ideals and impression management often obscure the reality of their lives and selves, not only to outsiders but also to themselves. By not solely relying on what people consciously articulate but rather by utilizing nonverbal cues, material artifacts, situational contexts and actual behavior and taking seriously seeming contradiction, ethnography may both circumvent the impression management of people and unpack hidden drivers and motives.

Third, investigating newly emerging needs and desires is likely to point towards new opportunities that can lead to novel solutions. Needs change in accordance with societal structures, cultural practices, and new means of satisfying needs. New needs surfacing in a situation of cultural or social transformation and technological change are different from existing and established needs, and so must be the solutions designed to address them. For instance, the unfolding needs and desires of students, who find themselves in an environment with heightened expectations on their performance and defined by a challenging mix of analog and digital learning tools and techniques, tend to resonate with this unique situation and cannot be served with old solutions, products and services.

Fourth, by paying attention to everyday practices and routines, ethnography frequently finds workarounds that people use. These are ad-hoc, improvised and often personal strategies that people employ to reach their goals in the face of challenges or in situations lacking established

solutions and existing products. Sometimes workarounds carry the seed for the type of solution that is required. When a mother tapes her phone to the baby stroller so that she can write text messages while pushing her child, there is a cue to a potential design solution. Like the inventions of lead users, workarounds found by ethnographic research can provide interesting pointers towards innovative solutions.

In sum, a focus in ethnographic research on unmet, hidden and newly emerging needs, motives and values and on everyday workarounds may guide the search for new solutions into new and uncharted territory. Yet, despite directing a guiding light into untapped directions and offering some inspirations for solutions or user requirements, an ethnographic approach cannot pre-determine these solutions, guarantee their novelty, and ensure their potential for business. Other techniques must complement the ethnographic approach.

Particularly, in order to turn ideas on potentially valuable solutions into an innovation on a marketplace knowledge of this marketplace is required. Strategic approaches like blue ocean analysis (Kim & Mauborgne, 2005) aim at such an understanding of the strategic market value that new products and services can capture. Referring to the renewal of corporate strategy rather than to incremental innovation in established business Kim and Mauborgne (2005, 218) remark that "value innovation is about redefining the problem an industry focuses on rather than finding solutions to existing problems". Putting a notion of (buyer) value and a focus on non-incremental innovation into the center of attention blue ocean analytical tools and frameworks suit to the attempt to drive innovation based on empirical customer values.

It is important to point out the differences between our concept of 'value innovation' based on real customer insights and the notion of value innovation on a corporate strategy level used in the literature on blue ocean strategy. Kim and Mauborgne (2005) discuss value innovation as strategic renewal impacting the corporate activity system rather than innovation in the sense of new product development. Their concept focuses on the notion of exchange value as discussed

above, and defines value through the alignment of innovation with utility, price and cost positions (2005, 13) and distinguishes between buyer value and company value. As buyer value is comprised of utility and price of a product, and company value is comprised of price and cost structure both may be remodeled in order to create or enter into an "uncontested market space". Trying to transcend established market boundaries and industry structure blue ocean strategy remains related to both as defined by the competition on the rather macroscopic level that is closely related to business model innovation. While such market analysis can identify potential new markets, the relevancy of the assumed, the potential real values for users, cannot be determined by it.

Combining market analysis and ethnographic approaches through the notion of value, in this paper we follow a user-centered and learner-centered paradigm, in which value is defined by the user or learner. The value proposition links business to the existential needs and motivations of different groups of people, and thereby the existential reason for the whole endeavor, the job to be done. A value proposition not only describes the functional utility, or what something can do, but also implies personal needs and values. Value innovation then refers to the empirically grounded development of new and relevant value propositions. Value innovation in our understanding is based on functional, emotional and symbolic user needs and values, backed up by cultural trends, intersecting with novel product value factors (functional, emotional and symbolic ones) backed up by market trends (see Figure 1 below).

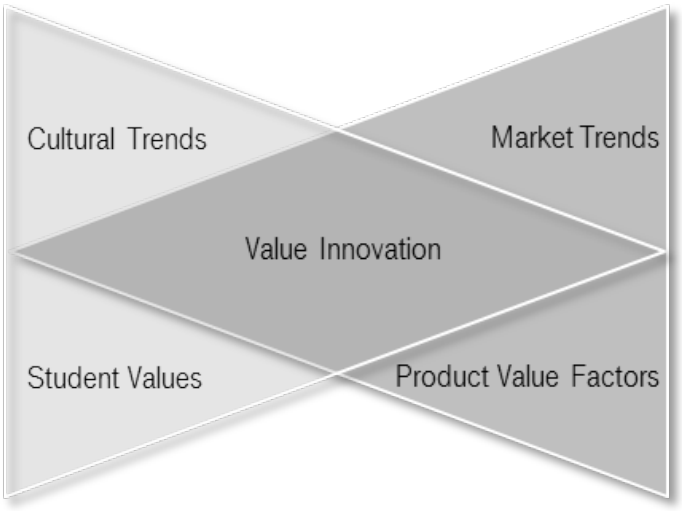


Figure 1 Value Innovation is based on an understanding of user / student values (backed up by cultural trends) intersecting with new product utility factors (backed up by market trends).

Methodology for identifying a potential value innovation

Based on this understanding of value innovation we suggest the following methodological approach within fields of cultural transformation such as today's higher education domain.

- A deep immersion into the world of the customer through ethnographic methods.
- Competitive analysis and contrasting market boundaries based on desk research and expert driven business modeling.
- Triangulation of both perspectives supports the creative generation of qualified product ideas and value propositions that also allow to maintain focus throughout innovation projects.

Immersion into students' lives is meant to yield insights into the nature of learning activities and challenges, reoccurring routines, obstacles, workarounds and problems as well as unfulfilled needs and values. Participant observers of students focus on unmet, hidden and newly emerging needs, values and motives and pay attention to workarounds in order to lay the direction for potentially novel perspectives and solutions. In order to do so it may be important to observe students in key learning situations, individual and social ones, in their homes and at other learning locations; to explore both digital and analog ways of studying, organizing material and note-taking etc.; and to investigate what it means to be a student today more broadly. In order to

analyze the current market desk research may proceed top down starting from global trends (such as the trend towards lifelong learning or the increasing importance of peer learning), or bottom up looking up relevant keywords in order to retrieve inspiring cases in terms of new products, new business (e.g. startups and corporate ventures) and emerging platforms and ecosystems. Most interesting cases may be shortlisted based on criteria such as e.g. market reach, novelty, time to mainstream adoption and attractiveness of the business model being pursued.

Looking into a specific market or product category (such as learning-management systems or digital textbooks) competitive factors of existing offerings represent the dimensions on which products within this category compete, e.g. the price or feature range or editing capabilities of a digital textbook. In blue ocean strategy a "value curve" is used to depict corporate or product scores on the main competing factors. The value curves of competitors are used to identify potentials for variation and extension. The so-called "four actions framework" promotes four kinds of variation to the main competing factors within an industry in order to generate a new buyer value curve. Variation eliminates, reduces or raises factors below or above the industry's standard or (in line with our approach to identify empirically grounded value innovation) creates new factors. It aims at increasing buyer value by optimizing utility and price, and to increase company value by optimizing price and cost structures (Kim & Mauborgne, 2005, 17). The identification of new competitive factors plays the decisive role in the attempt to create substantially new value for users. Several methods may be applied to identify new and unique product factors (such as a learner-centered modularity of content organized around learning goals in the case of digital textbooks). The ethnographically grounded approach to value innovation bears the greatest potential to introduce new product factors to blue ocean analysis based on a profound understanding of changing values of individuals and society. Such understanding is a sound basis for knowing which factors to eliminate-reduce-raise-create, and for knowing why to do so.

Triangulation makes it possible to scrutinize a problem from various sides in order to validate results and enable a broad understanding from multiple angles. The methodological and data sets triangulation suggested here can be also complemented by a triangulation with respect to researcher (see Figure 2 below). According to Denzin (1970) researcher triangulation involves different researchers during observation or data analysis. It is based on the assumption that participation of more than one researcher can mitigate the problem of conflicts of interest that may appear if it is the same researcher who both formulates a theory and empirically examines its research results. Also, different skills and backgrounds on behalf of different researchers may enrich the elaboration of results.

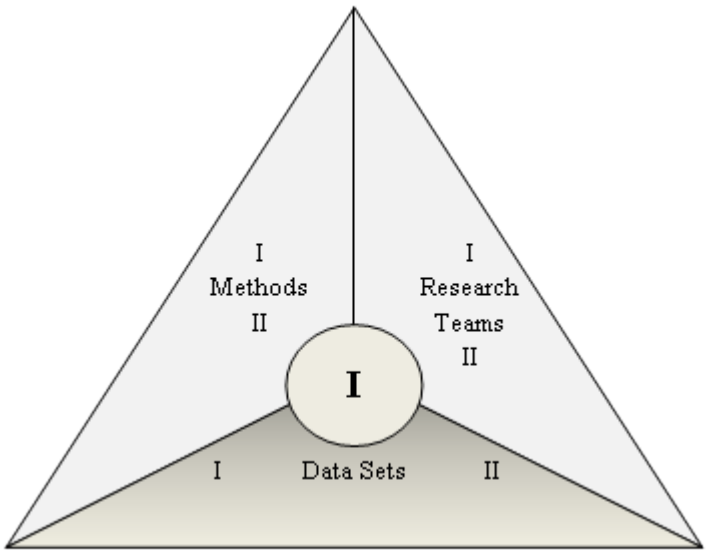


Figure 2 Triangulation of methods (I ethnography and II blue ocean), research teams (I anthropologists and II market researcher) and data sets (I on student life and values and II market state and benchmarks); results are synthesized in workshops aiming to find ideas for value innovation through interference of diverse knowledge types.

In this case, triangulating an empirically grounded understanding of learner values with knowledge about alternative market positions creates a productive foundation for identifying qualified ideas for new value propositions and offerings. Doing so still requires a vivid confrontation of different perspectives and (implicit and explicit) knowledge. The typical format for this is a workshop where carefully selected representatives bringing to the table different

kinds of knowledge interact in a live environment. A moderator and group exercises push participants to take their thinking off the beaten tracks of convention. Shifts in perspective are further encouraged through external participants, a thorough preparation and utilization of instructions and media, and specific communication techniques like ad-hoc visual documentation of discussions. Such an interactive environment of changing conditions aims at helping the actors generate new knowledge and ideas.

A Case on Learner-Centered Design

As an illustration for describing the approach and methodology for identifying a potential value innovation we use a recent innovation project in higher education in Germany. The project had the goal to identify potential new learner-centered tools and services for university students with high business potential. As suggested above, three different research methods were applied and combined to achieve a broader and deeper understanding of the topic at hand: Ethnography, desk research and blue ocean market analysis. The ethnographic part and the analytical part were each performed by two different research teams from different service providers; one specialized in market analysis, the other in ethnographic research.

Ethnographic research setup and results

One of the main challenges was to capture the broad variety of today's students' learning activities interests and values – and to find corresponding participants. Our sample contained 11 students between 19 and 27 who studied in or around Berlin, Germany. We strove for a balance between female and male, freshmen and advanced students, and students from different disciplines (law, business, and social sciences & humanities). The context and content of learning, learning techniques applied, as well as learning problems and needs differ widely depending on the discipline or desired degree. We wanted to understand not just learning activities in a narrow sense but also the organization of university life including issues like time management and collaborative learning.

The ethnographic research had two parts: participatory observation with ethnographic in-depth interviews followed by self-observation with online diaries. The observation aimed at understanding students' daily routines and different learning situations in order to identify latent, unmet or newly emerging needs and problems. Researchers participated in lectures and seminars, accompanied the students to study groups or library visits. The observations usually took two to three hours and were followed by a three-hour semi-structured interview in the student's familiar environment, usually their home. The interviews were designed to explore students' motivation, their social interactions, their learning behavior and strategies, the digital and analogue tools they used and student life in general. The second research part consisted of a five-day online diary. Students were asked to describe their learning activities, the use of digital and analogue tools, and potential problems and challenges. They were also encouraged to describe their motivation, dreams and ambitions by using pictures and short texts. The self-descriptive data helped to enrich and put into perspective the insights gained during field research.

The results were analyzed in a ten-day process of identifying patterns in the data collected and subsequent insight development. One result, for example, revealed that most of the students were struggling with time problems. Due to increasing study and difficulties to efficiently manage the time, nearly every student complained about running out of time and time pressure. Literature research, for example, appeared to be an especially time-consuming and costly activity. One of the students complained about finding and getting literature: "I usually dedicate my Saturdays for searching for books, getting them, going through them and copying the chapters we need." Other students reported on their struggles with limited access to online books and journals, especially from home, difficulty in assessing which article or book is worth reading, lack of overview and centralized control over different lending sources and costs caused by purchasing articles and lending fees. The observations also revealed some workarounds such as for instance checking reviews in Amazon before lending a book in order to save time.

More specifically, ethnographic research and analysis led to four different need or value clusters:

1. “Quality of learning” was reflected by students’ complaints about poor quality of educational materials and a lack of support when needed. The cluster also refers to students’ concerns about the quality of their education and their needs for effective learning techniques, from note taking and marking up digital content to understanding and memorizing content.
2. “Motivation” illustrates students’ needs for motivational support during the semester and the whole period of studies, their wish to sweeten study activities through little rewards and pleasures, their strong desire for feedback on learning outcomes, and their need to assess labor and time investments and progress in knowledge and skills.
3. The “efficiency” cluster describes students’ need to manage time and organize learning activities efficiently in an environment free from distractions. This includes the need to coordinate group activities and exchange insights and materials, also easy literature searching and quick access.
4. “Productivity / organizing” deals with students’ need for easy-to-use resources, well organized and managed study material, a flexible move between analogue and digital material, as well as ubiquitous but one-place access.

These results were then explored in a concept workshop with the goal to develop product ideas based on the obtained student needs.

Desk Research and Blue Ocean

In order to understand the educational market and educational trends a comprehensive desk research was conducted based on a wide screening of relevant publications and start-ups in the field of education. It identified a number of socio-economic and technological drivers, such as a growing demand for education and reorganization of knowledge, to name just a few. Based on these drivers six key educational trends were derived. Examples include:

• Open education: the growing amount of teaching content online and learner-generated content available (Breuer & Matsumoto, 2011),

• Edutainment – implementation of game mechanics in processes of learning, and

• Enriched content – integration of audiovisual interactive and social media elements into traditional content formats.

Some of the trend fields that resulted from desk research (e.g. enriched digital content) were selected for close examination. A blue ocean workshop was designed to identify various value curves of brands and products in order to distinguish the potential new business from its competitors. Creative sessions involving "learning from other brands" and "brainstorming with megatrends" revealed competitive factors for developing an innovative learning management system e.g. based on an increase or creation of flexibility, openness, personality development, emotions, fun and world of experience. Informed by the trend of enriched digital content and the empirical student need to quickly assess and find suitable literature, the attendees created new ideas for modular digital textbooks such as the concept of "Digital ConText Book" (see Figure 3 below).

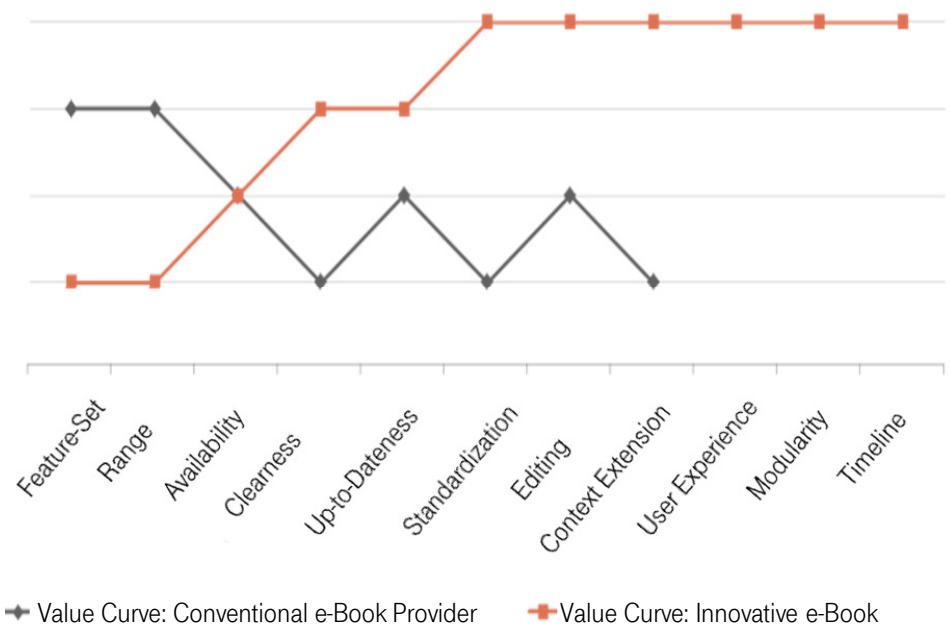


Figure 3 The value curve depicts depict corporate scores on the main competing factors of digital content providers.

Its modular structure allows to focus on educational content and learning goals. Students can purchase and work with relevant parts of a publication and do not have to buy an article or a book as a whole. They can also subscribe to topics they are interested in to get content from different journals, papers, single chapters of a book. In addition, learning materials, learner-generated content and documents can be matched to one's personal learning progress. Students can view and edit content that is created or organized and validated by a lecturer. The idea of a "Digital ConText Book" satisfies different needs identified through ethnographic research, e.g. the need for easy literature searching and access from different work locations. It offers efficiency that do not exist on the market yet and an added value by guaranteeing high quality of materials, providing flexibility in note taking and text marking, and allowing feedback on the progress in knowledge and skills, thus providing for a sense of overview and success.

Synthesis

Due to integrating the two perspectives of ethnographic research and blue ocean analysis the obtained results enriched and encouraged each other. On the one hand student needs and values, desires and problems described above could not be identified through desk research or blue ocean

strategies but rather only through a deep immersion into the students' worlds by using ethnographic methods. On the other hand ethnographic research cannot yield an overview over the educational market, its competitors and market niches. Only in combination can the derived ideas create a new market and meet customers' needs at the same time. Results of each methodological approach have not only enriched each other but also encouraged the project teams' assumption that the search field of higher education bares substantial and qualified business opportunities. These are based on uncovered customer values and needs and may be served by an industry that currently does not provide them.

Conclusions

We described a green-field approach on how to drive innovation in user- and learner-centered solutions based on an empirical understanding of student values, needs, and requirements (e.g. in terms of efficiency and time-management). Ethnographic results and a clear understanding of the strategic market position based on extended value curves informed strategic decisions and specification of propositions. Novel solutions were generated e.g. providing enhanced contexts to learning materials. Encouraged through their participation in the discovery of real user needs, values and strategic options, the business owners gained sufficient confidence in the concepts to invest in their development within a newly found business unit. First patent applications are underway. Their specification, implementation, marketing and validation in the marketplace are work in progress. Future review must show if a potential success of propositions may be traced back to these value-based concepts. So far, understanding user values, needs and desires, and strategic market analysis already created the indispensable basis for the attempt to develop new and relevant products and to establish sustainable business.

Acknowledgements

Many thanks to Gregor Erkel and Friedrich Kurz for enabling the project and for contributing essential ideas. They are working hard to turn these ideas into reality. We also thank our colleagues from User-Driven Innovation at Telekom Innovation Laboratories, Trommsdorff & Drüner, and Point Blank International for their support.

References

Atkinson, P., & Hammersley, M. (1994), Ethnography and participant observation. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research*. (pp. 248-261). Thousand Oaks, CA: Sage.

Baudrillard, J. (1991), *Der symbolische Tausch und der Tod (Symbolic Exchange and Death)*. Munich: Matthes & Seitz.

Bockhahn, S. R., & Schwarz, H. (2010), Anthropology as a tool for business innovation. *Ethnoscripts.* 12 (2).

Boztepe, S. (2003), The Notion of Value and Design. *Proceedings of the 6th Asian Design International Conference*, Tskuba, Japan, October 14-17, 2003.

Breuer, H., & Matsumoto, M. (2011), Ubiquitous Learning Environments: Notions of Context, Application Scenarios and Reflective Stories. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011* (pp. 2366-2374). Chesapeake, VA: AACE. Retrieved February 04, 2014, from http://www.editlib.org/p/38189

Breuer, H., & Steinhoff, F. (2010), Grounded Innovation – A Research Approach for the Fuzzy Front End of Innovation Management. *Proceedings of BAI International Conference on Business and Innovation:* Vol. 7 (ISSN 1729-9322). Kitakyushu, Japan.

Cefkin, M. (2009), *Ethnography and the Corporate Encounter.* New York: Berghahn Books.

Denzin, N.K. (1970), *The Research Act in Sociology: A Theoretical Introduction to Sociological Methods.* London: Butterworth.

Jordan, A. (2003), *Business Anthropology.* Long Grove, IL: Waveland Press.

Kim, W.C., & Mauborgne, R. (2005), *Blue Ocean Strategy. How to Create Uncontested Market Space and Make the Competition Irrelevant.* Boston: Harvard Business Press.

Lindlof, T., & Taylor, B. (2002), *Qualitative communication research methods* (2nd ed.). Thousand Oaks, CA: Sage.

Mariampolski, H. (2005), *Ethnography for Marketers. A Guide to Consumer Immersion.* Thousand Oaks, CA: Sage.

Marx, K. (1962), Das Kapital. Band I. Kritik der politischen Ökonomie. (Capital. A Critique of Political Economy). In *Karl Marx - Friedrich Engels - Werke*, Volume 23, (pp. 11-802), Berlin: Dietz Verlag.

Schrage, M. (2012), *Who Do You Want Your Customers to Become?* Boston, Mass.: Harvard Business School Publishing.

Sutherland, P., & Denny, R. (2007), *Doing Anthropology in Consumer Research.* Walnut Creek, CA: Left Coast Press.

Student Attitudes about Distance Education: Focusing on Context and Effective Practices.

Esther Smidt, Jennifer Bunk, Bridget McGrory, Rui Li, Tanya Gatenby

Abstract

There has been an unquestionable upsurge in distance education in recent years. Given this, it is extremely important to understand the experience of online courses from students' perspectives. The purpose of the current qualitative study is to understand student attitudes about distance education in a specific context, namely that of a Mid-Atlantic mid-sized state university. We then translate our findings into practical recommendations for instructors. Data sources consist of journal entries written by 36 teacher candidates taking the course, Teaching English Language Learners PreK-12. Findings are categorized according to Course Characteristics, e.g. students have definite opinions about the use of the discussion forum, some of them negative, Instructor Characteristics, e.g. students see the need for interaction/synchronous communication and effective assessment, and Learner Characteristics, e.g. the appropriateness of distance education depends on student learning style and practical factors.

Keywords: Distance Education; Student Attitudes; Effective Practices.

Introduction

There has been an unquestionable upsurge in distance education in recent years. Between 2002 and 2011, the percentage of college students who were enrolled in at least one online course increased from 9.6% to 32% (Allen & Seaman 2013). Given this, it is extremely important to understand the experience of online courses from students' perspectives. The ultimate beneficiaries of online education are, after all, the students.

The purpose of the current qualitative study is to understand student attitudes about distance education. To clarify, first, this study is student-focused and not faculty-focused. While we acknowledge the importance of investigating faculty attitudes about distance education, our goal is to move the spotlight onto students as well. Second, our focus is on attitudes, which have been classically defined in the social psychological literature as "an evaluation or evaluative judgment made with regard to an attitudinal object" (Weiss 2002, p. 175). Thus, student distance education attitudes represent cognitive assessments made by students regarding distance education.

We extend previous research in two ways. First, we prioritize student needs in a specific context by focusing on students from a mid-sized state university in the Mid-Atlantic region of the United States. Our goal is to understand the attitudes of these particular students in order to direct our efforts accordingly. We thus acknowledge that online learning phenomena can be, and often are, context specific (Gibbs 2010). Second, we direct attention towards effective practices. Findings have little practical use if they do not result in actionable knowledge. Therefore, we will translate our findings into practical recommendations for instructors (along with the necessary contextual caveats). Although changing teaching practices can be difficult, there is evidence that prior to making changes, instructors rely on student needs more than empirical findings (Price & Kirkwood 2013). Our student-centered practical approach will conceivably inspire instructors to make incremental changes to their online courses that will increase effectiveness and satisfaction.

What follows is a two-part review of the literature. First, we will present an overview of distance education research. Then, we will review empirical findings that are relevant to the focus of our current study.

Literature Review

Distance Education Research: An Overview

Kehoe, Tennent and Becker (2005) provide a useful framework for understanding distance education scholarship. Essentially, they divide the distance education experience into three parts: online material delivery, online assessment, and online interaction and engagement. With regard to online material delivery, research in this area is focused on the use of different delivery modalities including synchronous versus asynchronous (e.g., Carswell & Venkatesh 2002), and specific tools like discussion boards (e.g., Chapman, Storberg-Walker & Stone 2008) and WebCT (e.g., Osman 2005). Research focused on online assessment is concerned with quality and learning outcomes. For example, multiple meta-analyses have been conducted comparing learning outcomes in face-to-face versus online courses (e.g., Bernard, Abrami, Lou, Borokhovski, Wade & Wozney 2004; Means, Toyama, Murphy, Bakia & Jones 2009; Sitzmann, Kraiger, Stewart & Wisher 2006).

The third area that Kehoe, Tennent and Becker (2005) discuss is our area of focus: online interaction and engagement. Researchers in this area tend to be interested in student satisfaction and similar attitudinal variables. We will examine empirical findings in this area in the second part of our literature review. For now, it is worth stressing the utility of focusing on attitudinal outcomes like satisfaction. Not only is there evidence that attitudes about technology are related to performance outcomes (Petter & McLean 2009), but they can also help inform best practices. For example, if we know that students are dissatisfied with the amount of technical support they are receiving, we can focus our efforts on increasing the quality of such support. Another reason that focusing on attitudinal outcomes is so important is that they are a necessary piece to the

bigger picture. In other words, if our ultimate criterion is "success in distance education," that criterion would be deficient if we focused solely on learning outcomes. It would be difficult to argue that an online class was completely successful if the students learned a lot but did not have positive attitudes about the experience.

Student Attitudes about Distance Education: Empirical Findings

Internal Factors

One of the goals of the current study is to prioritize student needs by taking a student-centered approach to understanding attitudes about online coursework. Part of doing so means acknowledging that students' individual differences—or factors internal to individuals—are going to play a role in predicting satisfaction. To this end, a variety of studies in this area have found exactly this. For example, Sun, Tsai, Finger, Chen and Yeh (2008) found that learner computer anxiety was a critical factor in predicting satisfaction with e-learning. In this survey study, computer anxiety was defined as feelings of nervousness and discomfort when working with computers and satisfaction with e-learning was defined as students' overall sense of satisfaction with the e-learning course in which they were enrolled. In addition, Holley and Oliver (2010) used a biographical narrative approach to explore students' accounts of online learning. Analysis of the student narratives revealed that students' ability to control technology, along with students' educational experiences and expectations of managing their "learning spaces" played a role in students' engagement with online learning.

Moreover, the utilization of asynchronous communication tools, such as discussion boards, also points to the dissimilarities in student preferences which may be based on internal, individual differences. For example, Gilbert, Morton, and Rowley (2007) found that while 68% of students they surveyed were comfortable using discussion boards, 32% were "not sure" or "uneasy" about them. In addition, according to Osman (2005), 70% of students felt more comfortable participating in an online discussion forum compared to an in class discussion. These differences

in attitudes about discussion boards could be attributed to personality differences, where an introverted student may enjoy the feeling of anonymity created by participating in an online discussion compared to a face-to-face discussion.

Other studies have investigated satisfaction with the quality of online interactions. For example, Felix (2001) found that students had a negative attitude towards online learning when there was inadequate personal interaction. According to the results of this study, 10 students noted the lack of presence of a teacher to be a disadvantage compared to the 3 students who felt the exact opposite—that it was an advantage. Additionally, Lee, Srinivasan, Trail, Lewis and Lopez (2011) also found that students valued and benefitted from interaction with instructors and peers. When students were asked, "How could this course support your learning better?" interaction with teachers and peers was found as a primary solution. Lee et al. proposed an online or on-campus study group as a means to avoid feelings of isolation and discomfort with a lack of interaction. These effects related to interpersonal interaction could be due to personality differences. For example, an extroverted student may thrive on classroom interaction, feeling it is necessary to their understanding of the material. In particular, this extroverted student may value the direct interaction with a teacher.

Continuing with the exploration of internal factors affecting students' attitudes towards distance education, it would appear that one's self-discipline and drive will also play a role. A student lacking motivation may find it difficult to stay focused while completing online assignments. Smart and Cappel's (2006) findings support this belief as students who were interested in the material or identified with it demonstrated a higher level of motivation. Additionally, disinterest and distraction could explain some students' negative attitudes. Felix (2001) attributed distraction to the "wealth of information" offered by online learning, a problem he proposed was not as prevalent during the age of CD-ROM-based online learning. Currently, while participating in

online course work, the wonders of the internet and the potential for distraction are only a click away.

Interaction with External Factors

These internal factors affecting students' preferences are also influenced by external factors such as enrollment in an elective versus a required course. In a study by Smart and Cappel (2006) exploring students' perception of online learning, students enrolled in an elective course rated online classes positively, while those in a required course rated the online classes negatively. Those students enrolled in the elective course felt online learning was "an effective way to learn," was "fun," and were more likely to take online classes again in the future. This could be a result of the degree of interest in an elective versus a required course or the level of motivation or self-discipline of the students.

Another factor that can affect students' online course satisfaction is experience with technology. A lack of experience can interact with the existence of technological problems to heighten dissatisfaction. For example, Smart and Cappel (2006) suggested that students with more technological experience would be more likely to take an online class than those who did not have experience. They also suggested that the potential for technological problems and inexperience with technology could make lengthy assignments seem even longer and could potentially contribute to the frustration students feel with the amount of time required to complete online coursework. Indeed, Smart and Cappel found that 30% of students in their sample felt as if the amount of time it took to complete online assignments was not worth what was gained. Having experiences in an online learning unit in a blended context may likely benefit students in the future as they make decisions about selecting between different educational or training options. The results may suggest that students with more experience with technology and e-learning rate it more positively.

Students taking online courses value control over course content and this can interact with the choice of learning tools affecting satisfaction. Mockus, Dawson, Edel-Malizia, Shaffer, An, and Swaggerty (2011) demonstrated students' preferences for control in their online learning experience via a mobile learning study. Students used Androids, BlackBerrys, iPhones, iPhone Touches, and iPads as platforms to access course material. Findings revealed that students found course content delivered to their mobile device to be motivating and they enjoyed learning this way. The authors explained that this pointed towards the desire of students to engage in personalized learning. This demonstrates the importance of taking students' preferences into account, and utilizing effective tools to address these preferences to ensure continued satisfaction and participation in distance education.

External Factors

It is also essential to explore the role of external features on attitudes towards online learning. Another goal of the current study is to highlight the importance of these external components in understanding student attitudes about distance education. Several studies have found that a diverse set of external factors can predict student attitudes. One factor is the length of files to be downloaded, which will become increasingly important as instructors rely on more sophisticated multimedia like videos and podcasts. Related to this, Bolliger, Supanakorn, and Boggs (2010) investigated the impact of podcasting on student motivation and found that the length of files could have an impact on a learner's level of satisfaction. Specifically, some students felt downloads took too long, potentially causing them to lose focus.

Another external factor to consider is the kind of multimedia used in an online course. Boling, Hough, Krinsky, Saleem, and Stevens (2012) found that online classes that relied heavily on text-based multimedia were very unengaging and not effective in helping students to learn. They suggested that the use of interactive Web 2.0 tools could be more effective. Furthermore, Boling et al. proposed that the accessibility of instructors and information had an effect on determining

the overall impression of distance education, which was largely based on the design of online programs.

Students' perception of support is another external factor that can affect students' attitudes. According to a study by Lee et al. (2011), students' perception of support had a positive relationship with their degree of course satisfaction. When the above discussed technological problems or assignment confusion takes place, it is imperative that students feel that they can easily contact their instructor or an Information Technology (IT) staff member. Indeed, in a study by Gilbert et al. (2007), comfort with the amount of support offered was positively related to students' satisfaction with their online learning environment. As further evidence for the importance of support, Gilbert et al. (2007) found that a lack of resources and outdated materials could leave students feeling dissatisfied and unhappy with their online learning experience. In addition, Lee et al. also found course satisfaction to have a small yet notable correlation with final grades. This points to the importance of designing courses with a range of options of support and resources. As Lee et al stated, "access to a learning experience that is tailored to his/her learning style…may result in a more favorable course satisfaction" (pg. 161) and with that, potentially higher grades.

Felix (2001) also found that several other external factors could impact satisfaction with online courses. Specifically, he found that time flexibility, reinforced learning, privacy, wealth of information, ability to repeat exercises, and gaining computer literacy were all cited as advantages of online learning by students. This is promising, as it suggests that students appreciate the pedagogical benefits of distance education and that online instructors should do what is possible to increase these factors in their classes.

In summary, our review of the research related to students' attitudes about online learning reveals that a combination of both internal and external factors can affect student attitudes. In addition, it is clear that both positive and negative attitudes towards online learning exist. Our goal with the

current study is to build upon this research by prioritizing student needs in a specific context and identifying best practices.

Methodology

As intimated in the Literature Review, the research question of this qualitative research study is: *What do students think about distance education?*

Data sources consisted of 36 journal entries written by 36 teacher candidates taking the course, *Teaching English Language Learners PreK-12*, after listening to a research presentation entitled "*Reactions to and attitudes about asynchronous online discussion forums in an online faculty development program*." Particulars about the 36 teacher candidates are as follows:

Level	Number	Colleges	Number
Freshmen	2	College of Education	16
Sophomores	5	Health Sciences	6
Juniors	12	Arts and Sciences	11
Seniors	10	Visual and Performing Arts	1
Graduate	7	Undeclared	2
Total	36	Total	36

We, the first three co-authors, met weekly and kept researcher journals. We underwent training in NVivo 10, a qualitative research software. We then divided the journal entries into three groups, one per researcher, and created nodes. After this first pass, we compiled a nodes master list and recoded the journal entries, resulting in the following 16 nodes:

Nodes	References
Online	71
Positive	67
Negative	63
Discussion Board	46
Interaction	34
Neutral	26

Flexibility	24
Learning Style	22
Online Experience	17
Assessment	17
Blended Learning	14
No Online Experience	12
Workload	11
Synchronous	4
Experience	3
Face-to-Face	2

We then combined the three groups of journal entries and separated the nodes into "Negative" and "Positive" categories, as follows:

Nodes	Negative
Online	45
Discussion Board	24
Interaction	17
Learning Style	8
Workload	8
Online Experience	7
Assessment	6
No Online Experience	3
Positive	2
Blended Learning	2
Neutral	2
Flexibility	1

Nodes	Positive
Online	26
Discussion Board	26
Flexibility	20
Interaction	12
Learning Style	11
Blended Learning	9
Online Experience	9
Assessment	4
Synchronous	3
Workload	3
Negative	2
Face-to-Face	2
No Online Experience	1

As an analysis of the tables above reveals, some nodes were consistent in placement in both the negative and positive categories, for instance *Online, Discussion Board, Interaction, Learning Style, Online Experience, and Assessment*, while other nodes occupied obviously different placements, for example *Flexibility, Workload, Blended Learning, and Synchronous*.

We then conducted triangulation where we looked for representative excerpts of arising themes. While we were doing this, we realized that most of the nodes coded in negative and positive categories were related. We thus ended up recategorizing the nodes according to the themes of Course Characteristics, Instructor Characteristics, and Learner Characteristics, which are the first three learner satisfaction factors identified by Sun et al. (2008). It should also be noted that the

first two themes of Course and Instructor Characteristics would be subsumed under the External Factors mentioned in the Literature Review while the Learner Characteristics would be categorized under Internal Factors.

Discussion

Course Characteristics

Discussion Boards

The lack of well-designed tasks, particularly as they relate to discussion boards, was a negative course characteristic students felt keenly. Students saw ill-designed tasks as busywork. Among examples cited include uninteresting coursework that incorporated closed-ended questions that students could answer without actually having read the text. Students were also dissatisfied with the preponderance of tasks that catered to visual rather than auditory or kinesthetic learners (8 references of *Learning Style/Negative*). Implicit in these examples are the negative uses of discussion boards, as demonstrated by 24 references of *Discussion Board/Negative*. Indeed, NB2 lamented that a too structured prompt stifles creativity:

> *In terms of structured assignments, professors should keep in mind that even the smallest idea can spark thousands of new ideas within the minds of students, as everyone has a different perspective and might see something in a prompt that others might not see. When I see a prompt with a bunch of questions that need to be addressed, or that requires a certain number of posts, I lose all creativity. My response suddenly becomes about answering the question, meeting my minimum post requirement, and calling it complete. A discussion board that has too many guidelines or requirements feels like being given a picture and told to color inside the lines. It dismisses any chance for creativity or individuality by having all students conform to the same old cookie-cutter answers that get the good grades.*

The desire for creativity, collaborative learning and opportunities for open expression is aptly encapsulated by NT:

> *My other two classes at my community college were way better, because they were actually hands on. One of my teacher[s] would ask us to do something crafty, or make things out of clay or blocks (it was teaching elementary education). After we would create things she would ask us to take a picture of our ideas and post them. Then we would be able to view everyone's creative ideas and learn from each other. It did not always involve writing, which I found to be excellent! I felt as though I was actually learning something.*

NT's journal entry reiterated the point that asynchronous discussion does not have to be boring, nor does it have to leave out auditory and kinesthetic learners (11 references of *Learning Style/Positive*). HM, however, highlighted the benefit of synchronous audiovisual communication for multiple learning styles: "*In my ideal online class, instant chat or Skyping with a professor would be the best situation for learning."* This sentiment is reiterated by 3 references of *Synchronous/Positive*—there were no references of *Synchronous/Negative*.

Other positive experiences of discussion boards included the use of discussion leaders, groups, and different types of discussion boards (non-course boards and boards for general course questions). NB1 also specified the attraction of student generated questions:

> *Also, online courses always have assigned discussions. I had to for my summer course pick an article and ask my class questions one time. Then every other week I answered everyone else['s] questions. I think this was the most effective discussion methods, to have the students direct the questions because we were talking about what interested us.*

Students' positive experiences about well-designed discussion board activities were demonstrated by the 26 references of *Discussion Board/Positive*.

Students also suggested two features that would make discussion boards a better experience, firstly by making previous posts invisible:

> *I liked the idea of making other students' posts invisible because it will encourage them to: Actually do their own work and [d]o their work on time, because they will be forced to think of their own answers instead of re-wording a compilation of their classmates work five minutes before the deadline. (NL)*

Secondly, students complained about the inability of their being informed about reply posts, especially in situations where there was a significant lag time between posts and replies:

> *In online classes however, it is not as easy to communicate because the response is not immediate. If I did have a question, or presented an argument, the other person may not respond for a few days and I will forget what I was talking about. (FC)*

It should be noted that the new version of the Learning Management System allows students to subscribe to particular threads so that they are informed of replies to their posts.

There appeared to be some misconceptions about learning and distance education on the part of students that require some reeducation. Three participants considered collaborating and using supplementary materials and textbooks for assessment purposes to be cheating. DR2, for example, appeared to believe that learning consists of memorizing information and retaining knowledge:

> *Many times, classes that are online just state the facts and have open book tests and quizzes, which don't benefit the students. This is due to the fact that they are not learning and memorizing the information and retaining this knowledge, rather looking up facts to pass a class. Since the students aren't technically required to know the material, I feel that many online classes are easy A's and do not benefit everyone.*

Related to the excerpt above is the assumption by four participants that online courses are not rigorous and difficult—*"you should not take any of your core major classes online" (UM1)* and *"it is [not] beneficial to the overall education of the students to have a 300 or 400 level class online" (LG)* because *"[a]lthough they say online classes are more convenient, they are probably the most neglected classes that students leave until last minute" (FC)*.

Underlying these misconceptions may be the philosophy that a face-to-face class occurs in the *"real world" (SG)* while an online class does not. Moreover, *"too much technology creates a social barrier between students and teachers" (SP)*. Indeed, SP goes on to state categorically that:

> *While I believe that some online learning activities are okay, too much of anything is excessive. I am completely against online learning and it truly scares me for the future of my career. I want to teach students in a real classroom in a real school, in person.*

While no one would argue that face-to-face interaction is not real, the converse, that online interaction is fake and problematic, especially in a world that is moving exponentially towards social networking and telecommuting.

Blended Learning

Blended learning is one of the nodes that had different placements within the negative and positive categories, namely 9 references of *Blended Learning/Positive* as opposed to 2 references of *Blended Learning/Negative*. BG1's excerpt is representative of the positive attitudes about blended learning:

> *and also one of my Tues/Thurs classes had in-class learning every Tuesday and online learning/assignments due every Thursday. This was my absolute favorite because it enabled us to meet with the teacher and our classmates at least once a week, yet we could complete our assignments and outside of the classroom learning on our own time. I felt more independent this way and my grades were actually better than the typical in-class-only learning. To me, this type of learning felt more like what I'd expected college to be...what it was "supposed" to be, where our grades and how much effort/energy we put into an assignment was totally on us.*

Instructor Characteristics

Interaction

The lack of interaction, whether instructor-student or student-student, was one that students felt keenly, as demonstrated by 17 references of *Interaction/Negative* (and confirmed in Felix 2001). In particular, their inability to depend on non-verbal communication resulted in students' preference for agreeing with posts:

> *Interaction is key not only with your professor but also with your classmates. When you don't see someone face-to-face, you don't know anything about them. You don't know their tone of voice, their personality, etc. For this reason, in prompts like "respond to a classmates thoughts", I usually look for ones that I agree with, because it's first of all easier to agree with someone th[a]n it is to argue with them, but you also don't have to*

> *worry about offending anyone, or coming off as rude, since the people you are interacting with don't know your tone or your personality. (ML)*

This finding is illuminating since it provides a glimpse to the reason for the lack of critical thinking in some discussion posts.

Instructor Support, Student Autonomy, and Workload

A familiar complaint, as demonstrated by 8 references of *Workload/Negative* and confirmed by Smart and Cappel (2006), is that online courses have heavy workloads requiring student autonomy and what students perceive to be a lack of instructor support:

> *My personal opinion about online classes is that online classes place more responsibility and time on the student[s], rather than the professor. In previous online classes I have taken, I found that I needed to spend more time throughout the week focusing on my online classes than my classes that were face-to-face. I did not get the opportunity to attend class one to three times a week, and learn the information auditorally [sic]. Instead, I was teaching the information to myself over the course of many days. Also, I did not find it appropriate that online classes had different assignments due all throughout different times in the week. This resulted in confusion for both me and my classmates. Whereas in a face-to-face class, assignments are usually due on the date that you attend class. (FP)*

Organization and Clarity

Students also desired specific instructor characteristics, for example, prompt feedback and e-mail response from the instructor, and clear instructions and assessment requirements (as demonstrated by 6 references of *Assessment/Negative*):

> *The way the teacher grades assignments is also unclear in online classes. In my current class, my teacher is not clear with what she wants in her responses and as a result, some of the students are not doing as well as they deserve. (FC)*

In particular, strong organizational skills were highly appreciated:

> *At the beginning of the semester everything was posted on the online syllabus and she strictly followed the syllabus. For example, we even knew when ou[r] final was going to be due months ahead of time. I loved her organization. (NT)*

Learner Characteristics

Flexibility

One of the greatest advantages of online courses is students' ability to decide when, where, and how coursework should be completed, as demonstrated by 20 references of *Flexibility/Positive*. This is particularly true for students who emphasize self-paced learning and possess an independent learning style:

> *Another benefit to taking online classes is that it makes one's schedule more flexible. Instead of spending time in a classroom, online classes allow students to spend time in their homes. Because almost all of the assignments are posted online, students can s[p]end as much or as little time on each assignment as they think that they need. Also, some students learn and work better on their own time. Instead of sitting in a class listening to a teacher lecture, students can read a textbook on their own or teach themselves the material that they need to know. Also, if they need more time to work on an assignment, they are not restricted because they have all the time that they want to figure out a problem (LB)*

Shy/Introverted Students

As confirmed by 3 participants, and reiterated by Osman (2005), shy or introverted students express satisfaction with online courses:

> *But, on the other hand, I am a shy person, and I don't normally speak out in class, especially in response to another student. I would never disagree with someone in class, so an online aspect makes this part better for me. I feel that I am able to actually speak my mind through the computer, and not worry about someone judging my every spoken word in class. Through typing, I am able to take my time to think out my response, or erase my previous thought in order to rewrite my answer. (DR1)*
>
> *I feel that online classes allow students to freely and openly express themselves, especially if the students are on the quieter side. Online classes allow students who do not actively participate in classroom discussions a chance to voice their opinion through the computer. The safety of an online class allows shy students to show their intelligence without feeling as self-conscious and worried about their responses. (DR2)*

Student Investment

Conversely, a lack of student investment would adversely affect student performance and satisfaction in online courses. The lack of a captive audience and the need to be physically at a computer with its distractions (Felix 2001) and technical problems are issues students have to face, as stated by QE:

> *I am not going to spend more time with the online class than I have to. I will just write my post, fulfill the requirements, and then get on with my day. If there is a discussion in class I might as well participate because I have a certain time frame blocked out of my day to be in that class.*

Practical Applications

This paper began with the argument that it is important to investigate students' attitudes about distance education—that their thoughts and feelings matter. These attitudes vary based on students' individual differences. For example, the introverted students in this study thought differently about online courses when compared with their extroverted counterparts. It is also important to consider context, e.g. commuter students or students who work full time think differently about online courses when compared with traditional, on campus students. In other words, it is simplistic to decide that 'face-to-face courses are always better'—online courses may be better for some students in some contexts while face-to-face courses may be better for other students in different contexts.

Having said that, here are six practical applications that can be drawn from the findings of this study:

1. *Implement discussion boards carefully*: Ensure that tasks are well designed—they should encourage critical thinking, creativity, collaborative learning, and open expression, and cater to a variety of learning styles. Avoid closed-ended questions. Instead, encourage student generated questions. Also, task responses do not have to be text-heavy. Use discussion leaders, small groups, and multiple types of discussion boards. Encourage students to subscribe to discussion threads so that they will be informed of replies to their posts.
2. *Consider blended courses*: These courses may be the best of both worlds, although more data is required before this conclusion can be definitively drawn. However, students do think very positively of these courses.
3. *Focus on interaction and rapport*: To make up for the lack of face-to-face interaction, cultivate instructor-student and student-student online interaction and rapport. Encourage students to connect with the instructor and one another as individuals. Synchronous

audiovisual communication can feature greatly in this regard. In this way, it is hoped that students would move away from a preference for agreeing with their peers' posts in asynchronous discussion.

4. *Give students a realistic preview of the course*: Ensure that students understand that online courses require a new set of skills from them—autonomy, time management, intrinsic motivation, and student investment. Set students' expectations so that they can decide whether an online course is right for them.
5. *Be very organized*: Explicit and clear guidelines for assignments and tasks are critical. Prompt feedback and e-mail response is crucial.
6. *Be clear about what does, and does not, constitute cheating*: Online course instructors must set clear guidelines regarding academic honesty. For example, if students are expected to work alone for an assignment, this must be communicated. However, if assessments are "open book," the instructor should clearly communicate that using the book and supplementary materials is completely acceptable.

Conclusion

By its very nature, a qualitative study is context-specific. In this instance, the findings are derived from teacher candidates in a Mid-Atlantic mid-sized state university. Therefore, it is illuminating that this study's findings confirm what has been found in previous studies and add nuances that contribute to further knowledge in the field of distance education. Findings suggest students favor blended learning format and value the flexibility of an online environment. This is especially true for students who are shy or introverted in the face-to-face classroom. Students also expressed interaction is key to course success not only with their instructor but also with their peers. On the other hand, instructors should provide clear structure and guidance in addition to educating students about course expectations and responsibilities in online courses. It's also important to offer well-designed and creative tasks such as audiovisual content for multiple learning styles.

Using students' perceptions about distance education to help identify best practices is a logical approach. We hope that these six practical applications would give instructors a place to begin as they compare their online courses against the "evaluative judgment[s] made by [students] with regard to [distance education]" (Weiss 2002, p. 175).

References

Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States.* Pearson. Retrieved February 04, 2014, from http://files.eric.ed.gov/fulltext/ED541571.pdf

Boling, E. C., Hough, M., Krinsky, H., Saleem, H., & Stevens, M. (2012). Cutting the distance in distance education: Perspectives on what promotes positive, online learning experiences. *The Internet and Higher Education, 15*(2), 118-126.

Bolliger, D. U., Supanakorn, S., & Boggs, C. (2010). Impact of podcasting on student motivation in the online learning environment. *Computers & Education, 55*(2), 714-722.

Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., & Wozney, L. (2004). How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research, 74*, 379–439.

Carswell, A. D., & Venkatesh, V. (2002). Learner outcomes in an asynchronous distance education environment. *International Journal of Human–Computer Studies, 56*, 475–494.

Chapman, D., Storberg-Walker, J., & Stone, S. (2008) Hitting reply: A qualitative study to understand student decisions to respond to online discussion postings. *E-Learning, 5*(1), 29-39.

Felix, U. (2001). A multivariate analysis of students' experience of web based learning. *Australian Journal of Educational Technology, 17*(1), 21-36.

Gibbs, G. (2010). The importance of context in understanding teaching and learning: Reflections on thirty five years of pedagogic research. Retrieved February 04, 2014, from http://issotl10.indiana.edu/plenary.html

Gilbert, J., Morton, S., & Rowley, J. (2007). E-learning: The student experience. *British Journal of Educational Technology, 38*(4), 560-573.

Holley, D., & Oliver, M. (2010). Student engagement and blended learning: Portraits of risk. *Computers & Education, 54*(3), 693-700.

Kehoe, J., Tennent, B., & Becker, K. (2005). Using the web to enhance tertiary education learning experiences. Retrieved February 04, 2014, from http://ausweb.scu.edu.au/aw05/papers/refereed/kehoe/paper.html

Lee, S.J., Srinivasan, S., Trail, T., Lewis, D., & Lopez, S. (2011). Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*. doi: 10.1016/j.iheduc.2011.04.001.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.* Washington, D.C.: U.S. Department of Education, Office of Planning, Evaluation, and Policy Development.

Mockus, L., Dawson, H., Edel-Malizia, S., Shaffer, D., An, J., & Swaggerty, A. (2011). The impact of mobile access on motivation: Distance education student perceptions. *World Campus Learning Design*. Retrieved February 04, 2014, from http://learningdesign.psu.edu/research/MLRTWhitePaper.pdf

Osman, M. E. (2005). Students' reaction to WebCT: Implications for designing online learning environments. *International Journal of Instructional Media, 32*(4), 353-362.

Petter, S., & McLean, E. R. (2009). A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level. *Information & Management, 46*(3), 159-166.

Price, L., & Kirkwood, A. (2013). Using technology for teaching and learning in higher education: A critical review of the role of evidence in informing practice. *Higher Education Research and Development* (in press).

Sitzmann, T. M., Kraiger, K., Stewart, D. W., & Wisher, R. A. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. *Personnel Psychology, 59*, 623–664.

Smart, K. L., & Cappel, J. J. (2006). Students' perceptions of online learning: A comparative study. *Journal of Information Technology Education, 5*(1), 201-219.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008) What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education, 50*(4), 1183-1202.

Weiss, H. M. (2002). Deconstructing job satisfaction: Separating evaluations, beliefs, and affective experiences. *Human Resource Management Review, 12*, 173-194.

Human Resource Management Strategies and Teacher's Efficiency within Schools: A Co-relational Study.

Kiran Hashmi

Acknowledgement
Dr. Margaret Madden RSM
Margaret.madden@acu.edu.au
Australian Catholic University

Abstract

The aim of the paper is to study Human Resource Management and Development (HRMD) strategies and their effect on teachers' efficiency within the Catholic Board of Education (CBE) schools of Pakistan whose teachers are graduates in educational leadership courses from a private teacher education institutes in Karachi. The study endeavored to build a simple theoretical and conceptual framework where the effectiveness of HRMD strategies in educational leadership were studied to explore their impact on enhancing teachers' efficiency. Leadership education is a relatively a new field of study in the Pakistani education and the concept of Human Resource Management (HRM) is regarded as novel and its effective usage is rarely seen. HRM strategies if effectively utilized may become a source of developing a transparent performance management system, a collaborative and cooperative environment in the schools and of promoting teachers' efficiency in the areas of knowledge, values, skills and development as professionals as well as enhancing a school's productivity and improving its overall performance.

A survey methodology was adopted for the current research with purposive sampling to select 50 research participants and a questionnaire was used for data collection using an attitudinal scale. The results of the study revealed firstly that no relationship exists between the organization of the school and the newly acquired knowledge and skills of HRM. The school leaders are unaware of the various functions and strategies which are necessary to promote teachers' efficiency. Secondly, the study showed that some of the educational leaders are striving to meet the educational requirements of the times and to face challenges while using the learnt strategies of HRM to promote teachers' efficiency for the improvement of their particular schools.

Keywords: Human Resource Management and Development; teachers' efficiency; Pakistan.

Introduction

Pakistan's most recent Education Policy, (Ministry of Education [MoE] 2009) identified two gaps as the fundamental causes of the weak performance of its education sector. The first was named as the commitment gap, highlighting the lack of commitment to making education of good quality and accessible to all children. The second gap concerned the lack of implementation which has disaffected the implementation of policies with their relevant and updated educational practices. The two gaps are linked, as such 'a lack of commitment leads to poor implementation' while 'weak implementation leads to problems' (p.14) that can be traced to a lack of commitment and competence at governance and leadership levels (p.22).

The professional standards and expertise exercised by the Pakistani policy makers in the National and Provincial Ministries of Education as well as the principals and middle managers in the schools are fundamental to bridging the implementation gaps. Yet these pivotal educators are unprepared. While countries across the world place emphasis on educating school leaders and the establishment of academies for school leadership, in contrast, almost no persons in management positions in Pakistan's education sector have skills training in the function of educational leadership and are appointed to positions with little management experience (MoE 2009, p.28).

In 2008 the minorities' system of Catholic Education through its Board of Management for the Programme Office for Education (POE) took steps to address the dire need for quality leadership at both its system and individual school levels as a means to ensuring the long-term benefits of its programmes. Notre Dame Institute of Education (NDIE) was commissioned by the POE to design and implement an intervention to include the components of educational policy development and planning; curriculum development and implementation; and effective management structures and strategies. The Institute took the position that short term leadership in-service programmes would be neither effective nor efficient for long-term outcomes. With the

support of Australian Catholic University's (ACU) School of Educational Leadership three long-term systematic Award courses were designed and encultured for the Pakistani context.

To fill in the desired gap, in 2010 NDIE piloted a two year programme of educational leadership offering the (ACU Awards of Graduate Certificate (GradCert), Post- Graduate Certificate (PGCert) and Masters in Educational Leadership (MEdLead). An outcome of the implementation process was the development of the type of curriculum and instruction which aimed to create an environment of self-directed learning and decision making in committed and professionally qualified educational leaders who in turn contribute to the creation of a national educational environment where both equity and diversity are honored (Mission Statement of NDIE 1991; 2009).

Leadership in and for education and its development is a relatively new field of study in Pakistan as are the components of its curriculum. Human Resource Management and Development (HRMD) was included as a unit of study in the NDIE Masters course to help develop the skills of practical and strategic management of the personnel within a school. HRMD studies, while originating in the field of business studies, are equally relevant and critical for the effective management of educational institutes.

HRMD is considered as an important field of study for professionals in the corporate as well as in the education context. Such studies equip the leadership and management of different organization to deal with the human resources within an organization in multiple ways while utilizing its strategies to reach their goals (Akbar 2009; Guttel 2010; Bibi, Lanrong & Haseeb 2012; Wisdom & Ebimobowei 2013). Many studies have been conducted and provided valuable insights on HRMD in the corporate sector in the recent years; while neglect of such studies is evident in the paucity of utilization of effective HRMD in the education sector (Akbar 2009). Erdamar (2013) pointed out that the knowledge, awareness and application of HRMD is integral

to the effective functioning of education leaders as it helps to provide a foundation for the growth and promotion of education systems. Skilled and professionally qualified leaders in HRMD are considered to perform better for the development of the organization than the unqualified and unskilled ones (Iqbal, Arif & Abbas 2011). Furthermore, Hoffman and Shrew (2013) laid stress on the fact that the leaders' knowledge and skills of HRMD help in promoting the efficiency and efficacy of the staff leads to the development of their organization at large. The concept of utilizing HRMD in the corporate sector to achieve the desired goals has almost the same implication in the education sector. Leaders are required to be acquainted with the skills needed for effective leadership and management for the development of their institutions and the wellbeing of the human resource employed.

Considering the importance of HRMD and its practical implications for the effective performance of leaders in schools, the recent study involved participants from various geographical areas of Pakistan enrolled in the pilot NDIE-MEdLead course. The study's intent was to spotlight and investigate specifically selected strategies such as compensation, job description, training, performance appraisal, employee participation, leadership and team work in HRMD used by the unit participants as leaders in their local school settings in order to promote the teachers' efficiency. The study also aimed to be an evaluative tool for the researcher in identifying the co-relation between the content and learning-teaching strategies employed in teaching the HRMD unit of study and the participants' abilities to make relevant application in their work settings. From an analysis of this data, the research will gain practical insights for redesigning the study unit with a focus on ensuring the MEdLead students will gain better professional skills of managing HRMD having a balance of knowledge, understanding, creative and critical thinking within their personal and interpersonal capacities. Pakistan based research into the effects of conscious use of (HRMD strategies in the schools to promote teachers' efficiency is minimal and this fact urged the researcher to undertake the study.

Objectives of the Study

The objective of the study was to investigate how far applied HRMD strategies such as compensation, collaboration, team work, payments and rewards, professional development, employee management and performance appraisal have been effectively utilized in selected CBE schools across Pakistan and the impact these strategies have on teachers' efficiency. Efficiency of staff in an educational environment is not a tangible phenomenon which can be easily measured, as efficiency accounts for multiple psychological and social traits and little consensus has been reached in terms of its definition, attributes and construct as described by Hoffman and Shaw (2013, p.1). However, the research provided a critical attempt to check the applicability of HRMD strategies in the CBE schools which employ the NDIE MEdLead students.

Research Question

The problem to be probed through this research was the effect of HRMD strategies used by educational leaders professionally qualified from NDIE in the unit of Human Resource Management and Development (EDLE 679) offered under the ACU EdLead Award in promoting teachers' efficiency to improve the standard of the CBE schools.

The research problem of this paper is presented in the following question:

> What effect does the use of Human Resource Management and Development (HRMD) strategies by school leaders have on the efficiency of teachers in Catholic Board Schools in Pakistan?

The study adopted the following hypothesis:

> There exists a positive relationship between the Human Resource Management and Development (HRMD) strategies used by school leaders on the efficiency of teachers in the Catholic Board Schools in Pakistan.

$$\mu_{HRMDS} \neq \mu_{TE}$$

Purpose of the Study

The purpose of the study was to investigate the links between what was learned in a unit of study of HRMD and the participants' implementation of that specific learning in their workplaces. The study considered the recently established link between the participants' actions with identifiable and measurable efficiency criteria among teachers of the respective CBE schools, focusing on the efficiency criteria that were not present in the teachers prior to the interventions made by the unit participants. Furthermore, an attempt was made to find a measure of the improvement which the unit participants made in managing their staff more effectively through using a variety of strategies to develop and promote efficiency in them.

An anticipated outcome from the study is the assistance it will provide selected educational leaders to improve their practices of management and leadership for a sustained and accelerated outcome of their school. This study's importance for NDIE is the insights it will offer towards improving the set curricula for better applied outcomes most particularly as the EdLead programme is at the completion of its two year pilot phase. Through this study it is anticipated that NDIE will be able to evaluate classroom based efficiency and effectiveness of its educational leadership graduates working within the CBE school system across Pakistan

Study Organization

Following the introduction, the study presents the theoretical linkages between HRMD strategies and teachers' efficiency within schools. Section three provides a review of selected empirical studies on human resource strategies with the conceptual framework developed. The model of regression analysis is used to analyze data, the details of which are discussed in section four while the fifth section assesses the HRMD strategies utilized by the unit participants and

discusses the extent of the impact they create on teachers' efficiency in the selected CBE schools in Pakistan. The final section sets the directions for further measures and concludes the study.

Review of Literature

Theoretical Framework

Researchers such as Simatwa 2013; Kelly & Odden 2008; Wang, Chich-Jeng & Mei-Ling 2010; Jane, Mattew & Bedi 2010; Raccah 2012 suggests that the study of HRMD implies a combination of theories dealing with the social, psychological and economic dimensions of the leadership and employees. Theories of motivation, behaviorism and humanism form the proposition of theories used in this particular study as it investigates human resources within an organization. A critical analysis of these foundation theories leads to the development of three different perspectives of HRMD, namely the behavioral, normative and economic perspectives that can enhance employees' efficiency in an organization. The behavioral perspective highlights the analysis of employees' actions to identify behavior patterns that separate an effective employee from a non-performing employee, hence provide support to the leadership in managing them. The normative perspective of HRMD links workforce management to organizational strategy. HRMD stresses the linkage of functional areas such as manpower planning, job analysis, recruitment, compensation and benefits, performance evaluations, contract negotiations and labor legislations to corporate strategy. This link enforces the organization's interests over the employees' conflicting ambitions and interests. It views the workforce as passive resources that the organization can use and dispose of at will. On the other hand, the economic perspective holds the view that the strong natural inclination of people working in groups is to reduce their performance and rely on the efforts of others in the group. When one person delegates responsibility to another person, conflicts of interests invariably arise. The major role of human resource management in such a context is to promote alternative ways of controlling behavior to

reduce the effects of such conflicts and minimize the cost to the organization. This includes the two approaches of monitoring and incentive giving (Act of Managing Institutes, UK, 2009).

HRMD is arguably one of the challenging units of study in the field of business and has influenced the education sector in Western countries over the past 30 years (Nakpodia 2010). Recently it has stepped into the education sector of Pakistan (MoE 2009). While HRMD can be defined as the utilization of individuals to achieve organizational goals, effective HRMD is required in organizations to get things done (Koc 2010). Individuals dealing with HRMD matters face a multitude of challenges, ranging from a changing work force to government regulations, technological revolution and the recent global competition. Those engaged in its management must develop and work through an integrated HRMD system comprising such functions as staffing, human resource development, compensation and safety and employee labor relations (Mondy2009). Badri and Mourad (2012) stated that HRMD strategies enhance productivity and the effectiveness of the organization. When the leaders within organizations employ such personal practices as internal career ladders, formal training systems, result-oriented performance appraisal, employment security, employee voice and participation, broadly defined jobs and performance based compensation; they are more able to achieve their targets. The effective application of HRMD strategies by the educational leaders is likely to attain the desired outcomes of the institution.

Dessler and Varkkey (2011) highlighted the importance of HRMD for any organization to work and prosper. They hold that the paradigm shift in HRMD from the corporate sector to the education sector is a result of rapid globalization in the field of knowledge and education, increased competition in the education market, reduced financial budgets for the education sector and changing economic downturn. The economic blow from the West has affected the East as

well and therefore the education sector of Pakistan has incorporated HRMD in the studies of leadership at least in theory, in order to manage its human resources more effectively.

As research in the field evolved, scholars presented many different viewpoints on HRMD strategies. The theory of planned behavior by Azjen (2011) emphasized the viewpoint that HRMD managers tend to guide the human behavior of employees based on three beliefs, namely a belief about the likely consequence; a belief of the normative expectations of others; and beliefs about the presence of factors that may facilitate or impede the performance of the planned or desired behavior. In HRMD managers' respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior; normative beliefs result in perceived social pressure; and control beliefs give rise to perceived behavioral control. In combination, attitude toward the behavior, the subjective norm and the perception of behavioral control lead to the formation of a behavioral intention.

Following theory of Azjen, McClelland (2008) claimed that effective HRMD revolves around three major categories: achievement, affiliation and power. In an educational organization, the leaders use effective HRMD to build a framework where employees with different needs are motivated differently. To manage the employees suitably, high achievers in the organization should be given challenging projects with reachable goals and be provided frequent feedback. It is expected that the employees with a high affiliation need, perform best in a cooperative environment, hence HRMD managers strive to develop a collaborative environment in their respective organizations. Furthermore, the potential leaders within the educational organization should be picked and assigned with tasks and opportunities to manage others. In this way an effective system of management would be developed and the process of goal seeking would be made relatively easy (Mabin 2007). HRMD mainly works to promote the productivity,

performance and efficiency of the staff for the achievement of organizational objectives and progress.

Conceptual Framework

The conceptual framework of this study has been designed while keeping the determinants of the independent and dependent variables in consideration. The independent variable was the selected HRMD strategies (team work, performance appraisal, employee participation, job description, compensation and leadership), whereas, the dependent variable was teachers' efficiency accounting for the determinants of competency, compensation, work environment, job satisfaction and professional development.

If HRMD strategies such as compensation, pay, reward, benefits and policies within organisations are well thought out beforehand and applied effectively, it helps in the promotion and development of the commitment and performance of the employees. Self-directed and self-committed employees are considered an asset to an organization as such attributes among employees foster the productivity of the organization at large and help in sustaining it for a longer period. The applied HRMD strategies in the organization help in creating a meaningful way to meet the outcomes utilizing the physiological, psychological and social variables related to employee development (Erdamar 2011). Furthermore, that the efficiency of teachers/ employees can be enhanced if the educational leaders know which HRMD strategy is appropriate to be used at which time (Badri and Mourad 2011). To Koc (2011), the overall performance of the school depends on both the leadership and the employees as they need to operate in harmony while considering the qualitative and quantitative aspects of the operation of educational institutions. If HRMD strategies are applied in an effective manner, it is predicted that they develop a twofold environment where one outcome is to achieve the set targets by promoting the performance, productivity, efficiency, innovations reliability and security of the employees. The second

outcome concentrates on the wellbeing of the employees in terms of health and safety, satisfaction, pleasure, learning and personal development which enhances the morale, efficacy and efficiency of the employees through a system design.

HRMD strategies are a set of inner-organizational personal management strategies (Wang, Chich-jen, & Mei-ling 2010). The effective application of the HRMD strategies in different situations can help organizations use employees effectively for the completion of organizational targets. However, classifications of the HRMD strategies made by various scholars differ from each other. For example, the inducement strategy, the investment strategy and the participation strategy are presented by Dyer (1988), while Schuler (1989) addresses accumulation, utilization and facilitation. The development strategy, the motivational strategy, the reinforcement strategy and the transfer strategy as presented by Huang (1998) were taken as the dimensions of the HRMD strategies for the purposes of this research.

HRMD practices in organizations depend largely on relative powers of organizational actors to push innovation to enhance productivity. The nature of the relationship of the HRMD department with the different levels of management and employees develops a strategic plan that assists in the attainment of the set organizational goals (Jain, Mathew, & Bedi 2012). Agarwala (2003) examined the relationship between organizational commitment and the dimensions associated with HRMD practices, the extent of their introduction, their importance for goal achievement and the satisfaction with their implementation. He further found that among all dimensions, the introduction of such practices explained the maximum amount of variance in organizational commitment and thus were most effective in enhancing employee attachment to the organization. Agarwala's research indicated that HRMD practices such as innovative and an open work environment, opportunities for career development, development-oriented appraisal system and

comprehensive and customized training programs were positively linked with organizational commitment.

Methodology

The researcher adopted a survey methodology because of its strength in investigating the effect of the HRMD strategies used by the EdLead unit participants of NDIE to effect teachers' efficiency within the Catholic Board schools of Pakistan.

Target Population

The accessible population for this research was GradCert, PGCert and MEdLead students of NDIE who undertook their courses in educational leadership between 2010 and 2012. From the total accessible population, a sample of 50 participants was selected comprising of a total of 9 males and 41 females.

Sampling Technique

The purposive sampling technique was used in collecting data from the research participants as the focus of the research was to analyze the effect of HRMD strategies promoting teachers' efficiency by NDIE Edlead Graduates. The total research population was 76 out of which 9 expressed their non-availability to participate in the research activity; 11 had not completed the EdLead program; and 6 participants were not employed by the CBE. Therefore the researcher had available a total population of 50 participants who agreed to take part in the research activity and filled in the required questionnaire. All 50 research participants received a copy of the questionnaire which was the main data gathering tool and 44 returned the questionnaires completed according to the given instructions. The results of research are based on these 44 responses.

Instrument Development

The questionnaire used for data collection was divided into two sections. Section A was designed to acquire demographic information from the research participants in response to the most suitable variables while sections B was based on attitudinal scales. The two main types of attitudinal scales, namely Likert scale and rating scale, were used in developing the data collecting instrument.

Instrument Reliability

The value of Cronbach's Alpha calculated for data collected from the EdLead Unit participants of NDIE from all across Pakistan in relation to the overall reliability of the instrument was calculated to be 0.922 indexes, which shows high reliability value.

Table 1

Reliability Statistics

Cronbach's Alpha	N of Items
.922	15

Regression Model

For this study the Linear Regression Model (LRM) was used. The regression analysis focused on seven types of human resource management strategies which were training, performance appraisals, team work, employee participation, job description, compensation and leadership constituting together as the independent variable. The teacher efficiency variable consisted of knowledge, professional development, values and skills, and collaboration as indicators of dependent variable.

To examine the effectiveness of HRMD strategies on teachers' efficiency, the following empirical equation of the linear regression model was developed:

$$\beta_0 HRMD = +\beta_1 Kn + \beta_2 Pd + \beta_3 Vs + \beta_4 C$$

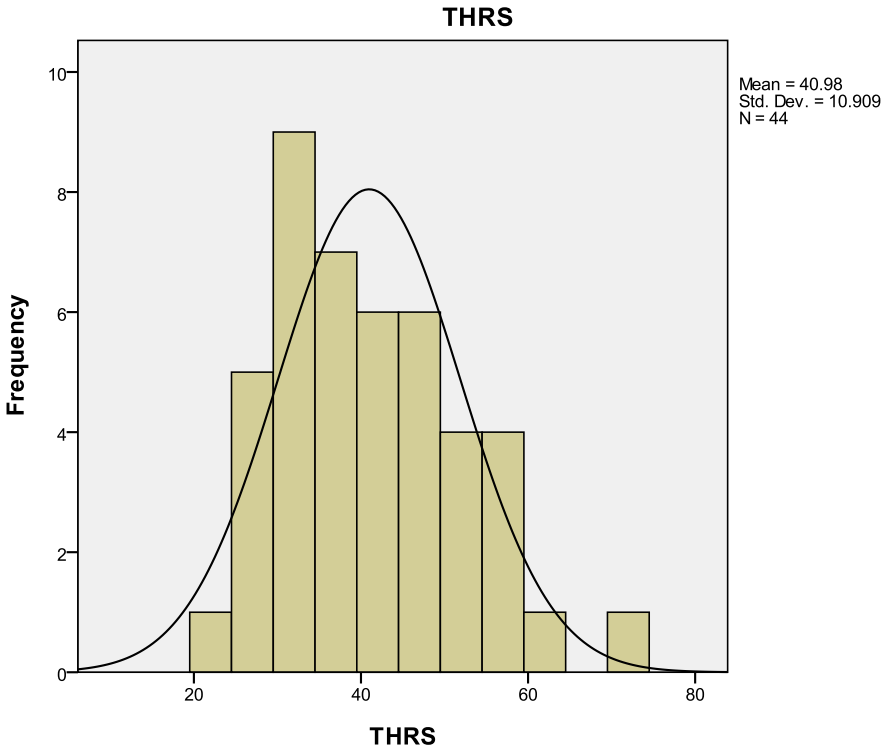
Where HRMD are the Human Resource Management strategies, KN is the knowledge of the teachers, PD is the professional development, VS are the required values and skills of the teacher and C is teachers' collaboration.

Data, Estimation Results and Findings

The estimation of the results is stated below:

Frequency Distribution

Figure 1



Descriptive Statistics Analysis

Table 2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
HRMDS	44	22	71	40.98	10.909	.535	.357
Valid N (listwise)	44						

The descriptive statistics above display the values of the measures of central tendency. The statistics exhibit that the HRMD strategies used at schools by leaders have a critical value less than 5 percent equivalent to 0.05 which indicates that the data is normally distributed. Moreover, the histogram presented above presents the same distribution of data.

The descriptive statistics reported in Table1 illustrate that the HRMD strategies used in the CBE schools are not according to the strategies applied in the other the educational institutes as described by literature. A possible reason for this result is that HRMD is a newer field of experience for the educational leaders of the CBE schools. A second possible reason is that teaching the unit through a mixed mode approach did not give a sufficient and holistic understanding of the application of the strategies, hence the educational leaders are not sufficiently aware of the effective use of the strategies. Furthermore, the results of the descriptive statistics shows that as the practicing and potential leaders are currently in the state of gaining professional qualifications, important aspects of increasing and improving teachers' efficiency within their schools are not skillfully utilized. The results also show the trend that current practices HRM by the educational leaders at CBE schools are not effective to an extent where it improves teachers' efficiency. The human resource management and development strategies were not effectively utilized by the educational leaders due to loosing leaders, within-system sorting, lack of finances for professional development and unqualified leadership (CBE Rule Book, 2006,

p.26). The value of the standard deviation is high which shows that the dispersion of the data from the midpoint and the critical value are at almost half of the mean for most of the variables.

Regression Analysis

The following section presents the result of the regression analysis undertaken using the above mentioned equation.

Table 3

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	41.279	7.591		5.438	.000
Knowledge	-.168	4.125	-.006	-.041	.968
(Constant)	36.862	8.834		4.173	.000
Knowledge	-.611	4.152	-.023	-.147	.884
Professional development	1.182	1.208	.152	.979	.333
(Constant)	50.465	10.873		4.641	.000
Knowledge	-1.813	4.049	-.068	-.448	.657
Professional development	.912	1.173	.117	.778	.441
Values and Skills	-4.065	2.018	-.306	-2.015	.051
(Constant)	52.677	11.448		4.601	.000
Knowledge	-.892	4.309	-.033	-.207	.837
Professional development	.546	1.304	.070	.418	.678
Values and Skills	-3.637	2.133	-.274	-1.705	.096
Collaboration	-1.102	1.664	-.118	-.662	.512

a. Dependent Variable: Teachers' Efficiency

Regression Findings

In order to see the effect of HRMD adopted by the EDLE 679 unit participants from NDIE to enhance their teachers' efficiency within schools, a linear regression analysis was done. The estimated growth equation displayed that in the regression model run with four independent variables, the model with collaboration showed a strong negative correlation. The rest of the variables, such as knowledge of the staff, their professional development and inculcation of values and skills had no effect on teachers' efficiency in their respective CBE schools.

The β value of the dependent variable (HRM strategies) shows that there exists a negative sign in the relationship. This accounts for multiple interpretations and inferences. Although the educational leaders were professionally qualified having degrees of Bachelors in Education (BEd) and Masters in Education (Med), still there is question on the quality of the implementation of the learnt skills in the professional education programmes. In the Med programme, although leadership and HRM are taught, its practical implication is not according to what is expected by the educational leaders. Secondly, it has been interpreted that as leadership education and particularly HRMD is a newer field in the education system in Pakistan, the educational leaders were not aware of the effective application of a HRMD system and hence did not apply it effectively. Another possibility could be the fact as HRMD is considered more of a concern of the corporate sectors therefore its effective utilization and implication in the education sector particularly in the schools system is rarely to be seen. This study was conducted amongst participants who had recently completed the unit EDLE 679 and perhaps the study had not allowed sufficient time for the participants to introduce and implement HRMD strategies into their local schools. Such changes do take time if they are to be effectively implemented. If this study is conducted again after 3 years, then there is a probability that the results would be different and more in line with what other researchers have documented.

As the regression result indicated a high degree of negative correlation between the two variables, it made little sense for the researcher to focus on the underlying possible internal and external factors which might have created an imbalance in the relationship between the two. The regression results have opened many avenues for improvement amongst the educational leaders of the CBE schools in particular. It is assumed that if educational leaders clearly define the job descriptions of their teachers and provide room for professional development, it is likely to develop a positive relationship between the selected variables of teachers' efficiency and determinants of the human resource management and development strategies. It is also recommended that if teachers are encouraged to contribute in quality enhancement of the managerial and academic processes at school, they would feel more empowered and the likelihood of a positive correlation will also occur. If a properly developed and managed staff performance management system is in place, it is expected that its measures will assist in enhancing teachers' efficiency within schools in the expected areas of concern. If teachers are provided performance based feedback and counseling, they will develop faith in the transparency of the performance appraisal system which in turn will enhance their efficiency at school. It is also expected that if teachers in the school are allowed to make decisions related to budget, functions and events, it will enhance their efficiency as well. Professional development programmes if conducted at intervals throughout the year for human resource personnel in each job specification, it will assist in enhancing teachers' efficiency. Through formal induction, orientation and training programmes new inductees will learn the required skills to perform their jobs in schools more efficiently. It is also expected that if teachers are provided opportunity to suggest improvements in the way things are done in the school, new knowledge and skills will be periodically imparted to the teachers which will help in enhancing their efficiency.

The findings of this study differ from the insights contained in the literature reviewed to support the study. The reviewed literature showed a positive relationships described by Akbar 2009;

Guttel 2010; Bibi, Lanrong & Haseeb 2012; Wisdom & Ebimobowei 2013 whereas in this study the Durban-Watson test showed a negative correlation. Therefore, the research hypothesis is rejected as the research found a negative correlation between HRM strategies and teachers' efficiency in the selected CBE schools of Pakistan.

Direction for Future Research

Overall the regression model is significant. However, the adjusted R2 value and Durbin-Watson value do not show the complete causal-effect relationship between the effect of HRMD strategies and teachers efficiency in the CBE schools of Pakistan. Therefore, further in-depth analysis is required in order to bring more authentic results.

Conclusions and Implications

In this paper the effect of HRMD strategies on teachers' efficiency within selected CBE schools was studied. A simple theoretical framework was built where the effects of HRMD strategies were contrasted with teachers' efficiency. Leadership and HRMD theories were taken into account and a theoretical framework was constructed. Moreover to further support the theoretical framework, a conceptual framework of the selected dependent and independent variables was also constructed to comprehend the research study. The result of the correlation test showed a negative correlation between the variables. The general lesson that emerges from this study is that the practical implication of the learnt theories is important in the current leadership scenario. Although CBE schools have shown their commitment, contribution, service and dedication in the improvement of the education sector, they now need to shift their attention towards teachers' growth and development by focusing more on the application of HRMD strategies. If CBE's HRMD department takes an account of the effectiveness of the strategies in the registered schools, the desired outcomes can possibly be achieved.

References

Achua, F. C., & Lussier, R. N. (2007), Leadership: Theory, application and skill development, 3rd edition, Cengage Learning, Canada.

Afza, T., & Nazir, M. S. (2007), Economic Competitiveness And Human Resource Development : An FDI Perspective, *Pakistan Economic and Social Review*, 45(2), 167-180.

Ali, A. (2009). The Role of Leadership in Human Resource Management a Comparative Study of Specific Public and Private Sectors in Pakistan, *Journal of Management and Social Sciences*, 5(2), 180-194.

Aloo, J. O., Simatwa, E. M. W., & Nyang, R. A. (2011), Impact of the School Based Teacher Recruitment Policy on the Distribution and Retention of Teachers in Public Secondary Schools in Kenya, A case study of Nyando District, 2(March), 1006–1020.

Armstrong, M. (2011), Strategic Human Resource Management: A guide to action, Kogan page, New Delhi.

Budhwar, P. S., & Sparrow, P. R. (2002), Strategic HUMAN RESOURCE MANAGEMENT Human Resource Management through the Cultural Looking Glass , Mapping the Cognition of British and Indian Managers, 599–639.

DeCenzo, D. A., Robbins, S. P. (2010), Human Resource Management 10th Edition. Balaji Enterprise, New Delhi.

Dessler, G., & Varkkey, B. (2011), Human Resource Management, 12th edition. Dorling Kindersley, New Delhi.

Franekel, J. R., Wallen, N. E., & Yuhan (2012), How to design and evaluate research in education, 6th edition, McGraw Hills Publication, New York.

Jain, H., Mathew, M., & Bedi, A. (2010), The International Journal of Human HUMAN RESOURCE MANAGEMENT innovations by Indian and foreign MNCs operating in India : a survey of HUMAN RESOURCE MANAGEMENT professionals, (March 2013), 37–41.

Johnson, L., & Shields, J. (2007), Lessons from management–union partnership in teacher performance appraisal in the New South Wales public education system, *International Journal of Human Resource Management*, 18(7), 1214-1227.

Koç, G. E. (2011), An investigation of student teachers' study strategies with respect to certain variables, *Educational Research and Evaluation: An International Journal on Theory and Practice*, 17(2), 69-83.

Mondy, R. W. (2010), Human Resource Management, 10th edition. Prentice Hall New Delhi.

Ministry of Education (2009), National Education Policy, Government of Pakistan, Islamabad.

Of, A. C., & Telecom, P. (2010), Impact of Human Resource Management (Human Resource Management) practices on employees performance.

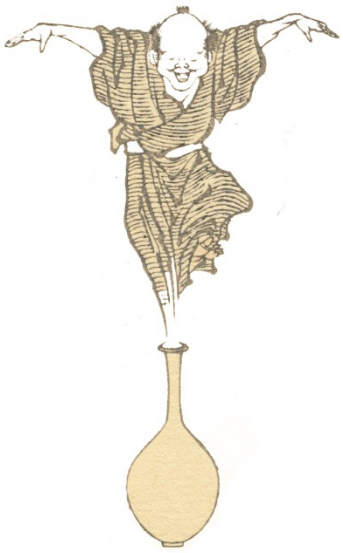
Pierce, J. L., & Newstorm, J. W. (2012), Leaders and the leadership process: Reading, self-assessments and application 6th edition, Mc Graw Hills Publication, New York.

Starratt, J. R. (2011), Refocusing school leadership: Foregrounding human development Human Resource Management throughout the work of the school, Routledge, New York.

Tomlinson, H. (2004), Educational Leadership: Personal growth for professional development, Sage Publication, London.

Wang, F., Chich-jen, S., & Mei-ling, T. (2010), Effect of leadership style on organizational performance as viewed from Human Resource Management strategy, *African Journal of Business Management*, 4(18), 3924–3936.

Wichenje, K. M., Simatwa, E. M. W., Okuom, H. A., & Kegode, E. A. (2012), Human Resource Management : challenges for head teachers in Public Secondary Schools in Kenya , a case study of Kakamega East District, *Educational Research*, 3(2), 159–171.



“I prefer to think for myself”: Upper Secondary School Pupils’ Attitudes towards Computer-based Spanish Grammar Exercises.

Kent Fredholm

Abstract

There is an increasing pressure from school leaders in many countries for teaching to be based solely on ICT tools. The present study is interested in what this does to pupils' attitudes towards ICT in language classrooms. Is a digital monopoly a good way for pupils to learn languages? Is it what they want?

To understand for which tasks students feel that computers are an appropriate tool, a qualitative survey mapping upper secondary school pupils' attitudes towards the ICT use for learning Spanish has been conducted. The study looks at ICT use for grammar practice. A group of pupils have completed lesson diaries, reflecting upon web-based grammar exercises, comparing them to paper-based exercises, and a questionnaire survey on general attitudes towards ICT in language learning.

The results indicate that the majority of participating pupils ask for a greater variety of tasks and see a need also for traditional forms of grammar practice, especially written exercises which give time to reflect upon grammar, syntax and vocabulary. They want ICT use to be an option, not a constraint. Many complain on flaws in the design of web-based grammar exercises. This shows a need for more research into the effects of different designs of web-based tools. It also becomes clearer that decision-makers and teachers must focus more on the pedagogical purpose of learning tasks and that the first question to ask is: "How can I teach this in a way that suits my pupils?" rather than: "How can I add more ICT to my teaching?".

Keywords: ICT; CALL; Foreign language learning; Pupils' attitudes; Grammar learning.

Introduction and background

I am one of many teachers witnessing the Information and Communications Technology (ICT) revolution reaching our schools, as an ambitious 1:1-laptop programme is being implemented in the public upper secondary school where I teach. When private schools started offering free laptops, it was seen as a way to attract pupils from public schools (Lund, 2006, 2007; Odlander, 2007). The current 1:1-implementation is motivated otherwise: we need to prepare today's youth for tomorrow's future, increase entrepreneurial thinking and find new teaching methods to enhance pupils' learning (examples from discussions among local school authorities). Educational challenges like these are seemingly all to be solved by giving computers to the pupils. As is often the case, much thinking and dreaming goes on before the computers arrive, but fewer efforts are done after that to make something out of the technology (cf. Svärdhagen et al., 2011). A worrying tendency, locally but also reported in international reports (e.g. Zucker et al., 2005), is the wish to use ICT to save money on other teaching material.

Many researchers and opinion-makers seem fairly agreed on the need to use ICT in school. Cobo Romaní & Moravec (2011) discuss how Drucker's (1959) vision of the "knowledge worker" has realised itself and that pupils need to know how to handle the new technique, an opinion expressed also in Motteram (2011). Cobo Romaní and Moravec observe, nevertheless, that this does not necessarily mean that ICT is always the best method. The voices heard on ICT in school are, however, mostly focusing on the need of getting more teachers to use ICT, rather than discussing when, how or why (from a pedagogical point of view) ICT should be used.

Computers are often thought to automatically motivate pupils (Zucker et al., 2005; Ware et al., 2006; Kahraman et al., 2011; Edmunds et al., 2012; AlAmmary, 2012; Tallvid et al., 2009). According to Usta (2011), however, neither traditional nor web-based teaching methods influence on pupils' attitudes towards computers or the Internet; considering this, the methods per se would

not automatically constitute a motivating (or demotivating) factor; what is needed is rather a well-planned and varied teaching adapted to student needs and preferences. There are indications that pupils grow weary of computers as the charm of the novelty wears off (Wiebe et al., 2010; Lim et al., 2006; Warschauer, 1996; Chiu et al., 2013). Few seem to bother, though, to ask pupils what they perceive as instructive methods.

As Svensson (2008) and others (e.g. Enkvist, 2002, 2011; Roszak, 1994) point out, there is sometimes an "almost regularly occurring overconfidence in new media" (Svensson, 2008, p. 145, my translation). This overconfidence may be forcing ICT-based teaching methods prematurely on teachers and students, thus neglecting other ways of teaching and learning, as well as impeding a well thought-out use of ICT tools in classroom practice. Ware et al. (2006) stress that, "Justification for the new uses of technology must be based, not on unmitigated, unrealistic optimism, or on uninformed, a priori rejection, but on empirical data matched to particular uses in specific contexts." (p. 4). Chapelle (2011) also says that it is difficult to conclude what are the effects of ICT use in language instruction, and Buskqvist et al. (2011) write that it is "problematic that implementations of ICT-based forms or elements of instruction are based neither on scientific evidence nor are followed up by scientific studies" (pp. 68 – 69; my translation). In *New Millennium Learners*, the OECD admits the "intrinsic difficulty when researching the effects of technology on educational performance", and mentions "inconclusive results" (OECD, 2008, p. 7; cf. Rosén, 2012), a view shared by Chapelle (2011). According to Nutta (1998), ICT-based grammar instruction can be as effective or more so than traditional one, while Lim et al. (2006), on the other hand, have found that CALL does not necessarily give better results than traditional instruction. Kroksmark (2006) suggests that pupils might prefer traditional teaching. Interestingly, Wiebe & Kabata, (2010) have found in several studies that teachers perceive ICT use as more useful than many pupils do, and Svärdhagen et al. (2011) point out that school leaders, in their

turn, put more faith in it than teachers do. It may be time to find out more about what the pupils who use the technology actually think of it.

Aim of the present study

A better understanding of pupils' views on purposeful and instructive ICT use in language learning could help us construct better programs and software, and make us understand what needs to be studied more (Larsson, 1986). To be able to perform research on how ICT use changes learning outcomes, we first need to gain a better understanding of what pupils do with their computers in school, and what their feelings towards these study methods are (cf. Wiebe et al., 2010).

According to Ayres (2010), ICT is particularly useful for practicing spelling, writing and grammar skills, but less motivating in other cases. The present study is particularly interested in situations where ICT can be perceived of as obstructing or disrupting the learning, or simply not functioning well, from the pupils' point of view. This is less studied than ICT as a motivating factor; cf., though, Granath et al. (2008) and Andersson (2010), among others.

The aim of the present study is, thus, to investigate attitudes among Swedish upper secondary school pupils towards ICT use for Spanish grammar learning. In order to clarify these opinions, computer-based learning methods are compared to "paper-based" methods. This can hopefully contribute to a better understanding of learning processes in 1:1 language classrooms and of pupils' views on appropriate ICT use for language learning.

The main research questions are:

- When do pupils see computers as an appropriate tool for learning Spanish grammar?
- When do they not see them as appropriate?
- What didactic and scientific implications can be drawn from these results?

Methods

Data were collected at three occasions during the autumn of 2012, using two lesson diaries and a questionnaire. In both diaries, the pupils evaluated and reflected on the teaching methods and grammar exercises they had worked with. The questionnaire, designed according to guidelines in Dörnyei (2010, chap. 2), focused on general attitudes towards computer-based and paper-based grammar learning. The study shows the pupils' thoughts over a few months, thus reducing the issue of attitudinal changes over time (cf. Dörnyei and Ushioda, 2011).

The diaries and the questionnaire were distributed through a course management system (CMS)[1] used at the school and chosen for practical reasons, being already there, ready to be used and known to the pupils.

For the lesson work preceding the lesson diaries, online exercises were chosen to reflect types of exercises easily accessible on the internet and regularly used at the school of current interest.[2] The exercises consist of fill-in-the-blanks, matching, verb conjugations exercises and similar activities, which, according to Tomlinson (2011), still make up the major part of self-access online material for language practice. The paper-based exercises were produced by teachers or taken from a Spanish textbook (Vanäs Hedberg et al., 2008), and other commercially available material such as Grönwald (1999a, 1999b). The main difference between the exercises was that the paper-based ones also contained sentences to translate to and from Spanish, which will be further commented on later.

The analysis of the lesson diaries and the questionnaire follows a theme-based qualitative content analysis, inspired by phenomenographic methods such as described by Larsson (1986).

[1] See www.itslearning.com. "Courseware", "virtual learning environment", "learning management system" are other terms for this kind of platform (Svensson, 2008; Cavus et al., 2010).
[2] Established through personal experience and discussions during language teachers' conferences. The online exercises were mainly from http://cvc.cervantes.es/ensenanza/actividades_ave/aveteca.htm and http://www.ver-taal.com/.

Participants

Twenty-six pupils in a group of twenty-seven, age 17, gave their informed consent to be part of the study. The average answer rate was 89%. There were 6 boys and 21 girls, reflecting the uneven distribution of Swedish language students at their level (Lannvik Duregård, 2010). The participants being my own pupils, I have avoided to discuss views on learning methods or in other ways alter their opinions. A variety of teaching methods has been used, involving computers as much as other modalities. It has also been clearly pointed out that the study has no relation to grading or other forms of assessing their language skills.

The group was chosen for its mix of pupils from different study programmes: the Arts Programme (henceforth "Arts", 5 pupils); the Business Management and Economics Programme ("Economics", 4 pupils); the Natural Science Programme ("Science", 15 pupils); and the International TIME Programme[3] (1 pupil). The TIME pupil's answers are analysed with the Science pupils'. It was their sixth year of Spanish studies and their Spanish proficiency corresponded approximately to the B1 level of the CEFR scale (cf. Skolverket, 2013). They had their own laptops, provided by their schools.

A note on terminology

Exercises, grammar explanations, etc. in books and on loose sheets of paper are referred to as "paper-based", exercises etc. in digital form as "computer-based". The term "online" is used for explanations and exercises on the Internet. The term "ICT" (information and communication technologies) is used for discussing not only computers but other digital technologies as well (cf. Kern, 2006, p. 185).

[3] This is a Natural Science programme specialising in "telecommunication, IT, media and interactive entertainment" (Karlstads kommun, 2012).

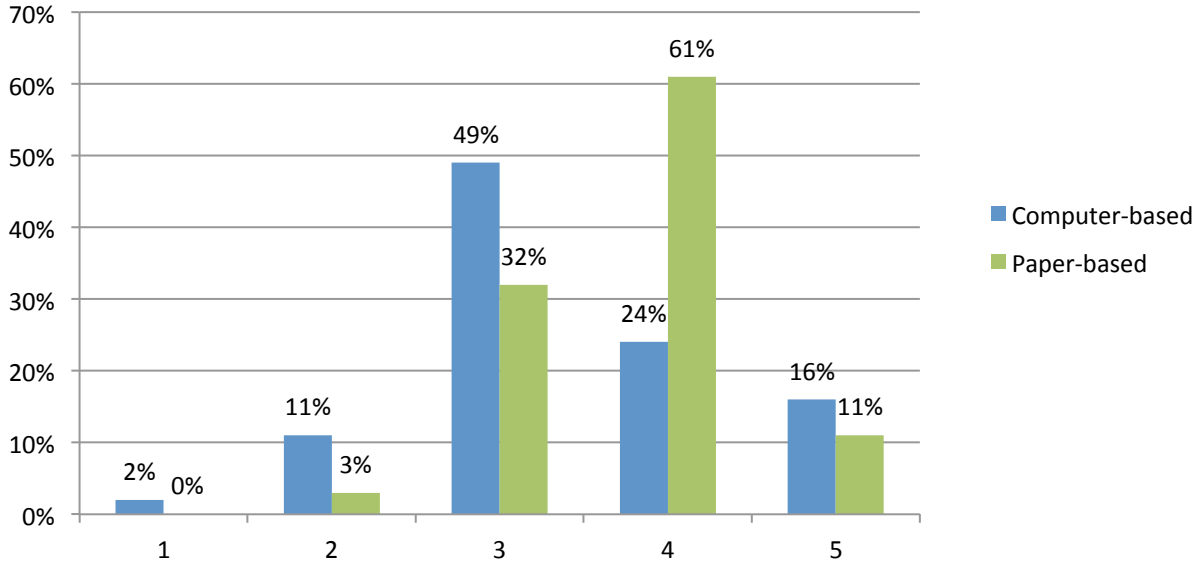
Results and reflections

Results from Lesson diaries

The lesson diaries focused on pupils' perceptions of grammar exercises on the Spanish future tense and gerund constructions.[4]

According to Edmunds et al. (2012), using the "Technology Acceptance Model" developed by Davis (1989), the perceived ease of use and the perceived usefulness influence on the user acceptance of a technology. Bearing this in mind, the pupils were asked to grade the instructive value of the computer-based exercises, on a Likert-scale from 1 to 5. Diagram 1 shows the mean percentage from both diaries.

Diagram 1 – Perceived instructive value of exercises (group level)



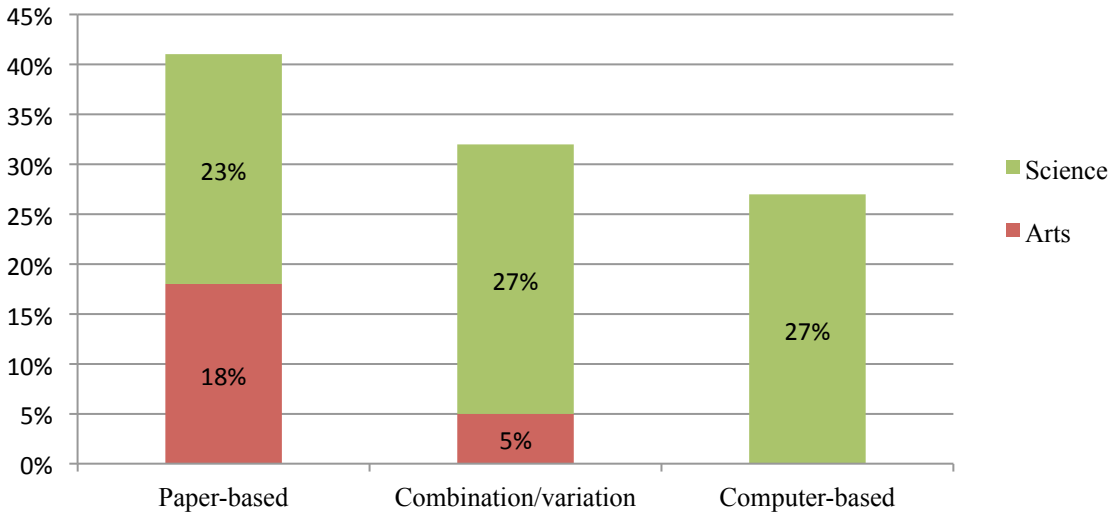
More pupils rated computer-based exercises than paper-based ones "5", but on a whole they preferred the paper-based exercises. Views differed more within the computer-based exercise answers. The Science pupils were more negative to computer-based exercises than the other pupils. It is unlikely that this is due to differing computer skills or experience, as most of the pupils considered their computer skills good (Diagram 3).

[4] These areas were part of the participants' on-going curriculum.

The computer-based exercises rated higher in the second diary than in the first. The most common rating was still "3", though, whereas the perceived instructive value of the paper-based exercises continued to rate higher than the computer-based. The increase in popularity for the online exercises can be explained by the fact that they were better structured than the exercises in the first lesson diary. Pupil 8 (Science) commented that the instructions were easy and that her opinion depended "on the quality of the web-sites".

When asked which kind of exercise they generally prefer, (keeping instructive value in mind but also considering other criteria such as being fun, user friendliness, etc.), the pupils answered as in Diagram 2. (No Economics pupils answered this question.)

Diagram 2 – Preferences: computer-based or paper-based exercises



There was a slight preference for paper-based exercises. Some of the motivations for this were that the pupils felt that they learned better when they wrote by hand, that it was easier to focus on the task and that they "sort of get the feeling in the hand" (pupil 16, Arts) when writing by hand.[5] Every Arts pupil but one preferred paper-based exercises, and no one wanted only computer-based exercises. Only 6 out of 22 pupils (27%) preferred to use only the computer, none of them

[5] Cf. Longcamp et al. (2008) and Velay et al. (2004a, 2004b), for neurocognitive studies where young and adult learners recognised and remembered letters better when they had learned them by handwriting, compared to typing on a computer.

Arts pupils, while the remaining 73% preferred to work with paper-based exercises or with a combination. This wish for combined teaching methods is in line with Motteram's (2011) opinion that web-resources do not cross out the use of text-books but can be a way to enhance them or update their information. These results might also be compared with Wiebe et al. (2010), saying that, "students chose their textbooks to be the most effective for materials in their course" (p. 226) and Hegelheimer et al., (2006) writing that "learners often want to focus on form and wish for a pedagogical tool to serve as a reference and an easy-to-use resource" (p. 259).

In the general comments on computer-based and paper-based exercises, only one pupil thought that the paper-based exercises were "fun"; many appreciated them, however, seeing them as instructive and presenting them with a good opportunity to review old knowledge and learn more. Several pupils mentioned the instructive value of tasks involving translation of entire sentences, (something rarely seen in computer-based exercises), and asked for more of them. In a Swedish school context, this is worth noticing, as the national curriculum for foreign languages does not include translation (Skolverket, 2013; cf. Council of Europe, 2001, chap. 2.1.3).

Several pupils stated that they learned more easily when working with pen and paper. Only three pupils believed that they learned more from online exercises then from paper-based, and some pointed out that a combination of methods is preferable. One pupil (5; Science) said that online exercises facilitate revising grammar at home, but others thought that papers are easier to save for reviewing. The variation of working with both paper-based and computer-based exercises also made it easier for her to work for longer without getting tired or bored. Another pupil (2; Science) commented that being able to choose from many different types of exercises makes it easier to cater for different learning styles. A few pupils preferred the online exercises because they did not have to keep any papers, whereas others wanted papers as they felt that it was easier to gather all the papers in one place and keep them for reviewing or studying for tests later.

Results from the Questionnaire survey

The questionnaire focused on general attitudes towards the use of ICT, compared to paper-based methods. Questions were also asked about general computer competence and confidence, and computer use in and outside of school.

Computer competence and general computer use

As indicated in Diagram 3, a majority of the pupils had high or very high confidence in their computer competence. Most of them were frequent computer users at home and at school (Diagrams 4 and 5). Negative attitudes towards the use of ICT can apparently not be explained with lack of computer competence or experience, in this study.

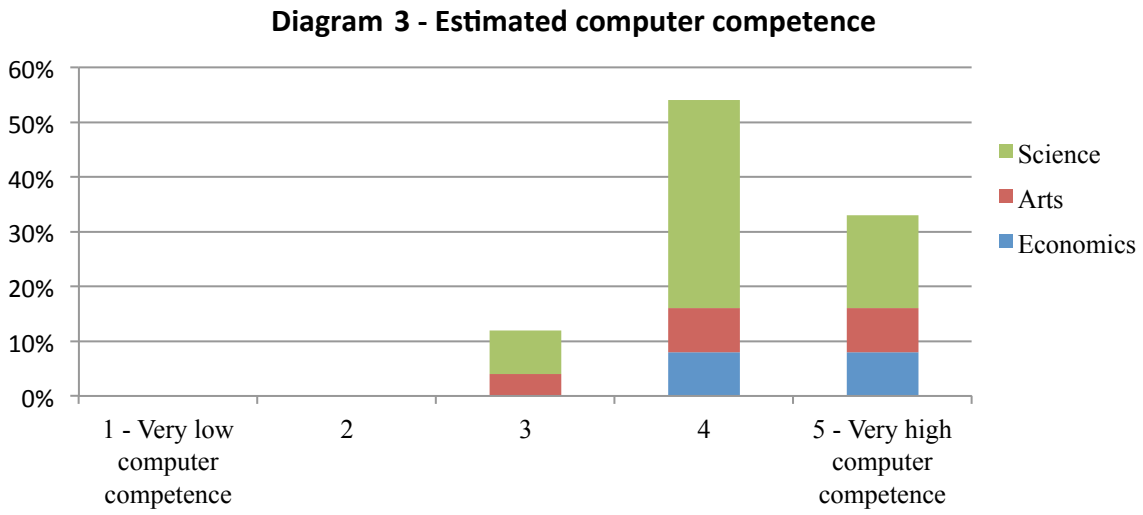


Diagram 4 - Frequency of computer use at home for school purposes

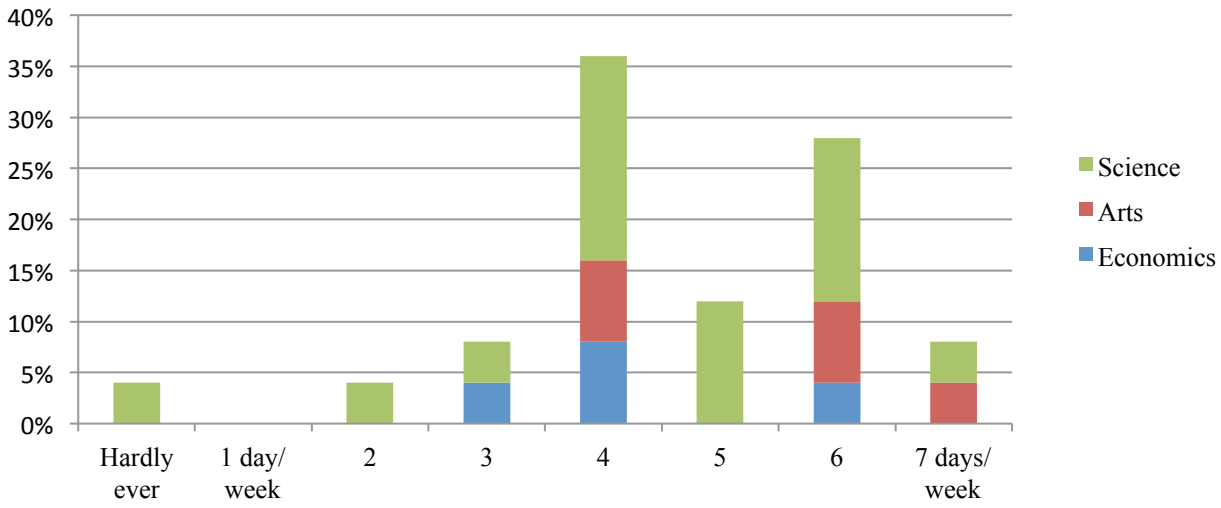
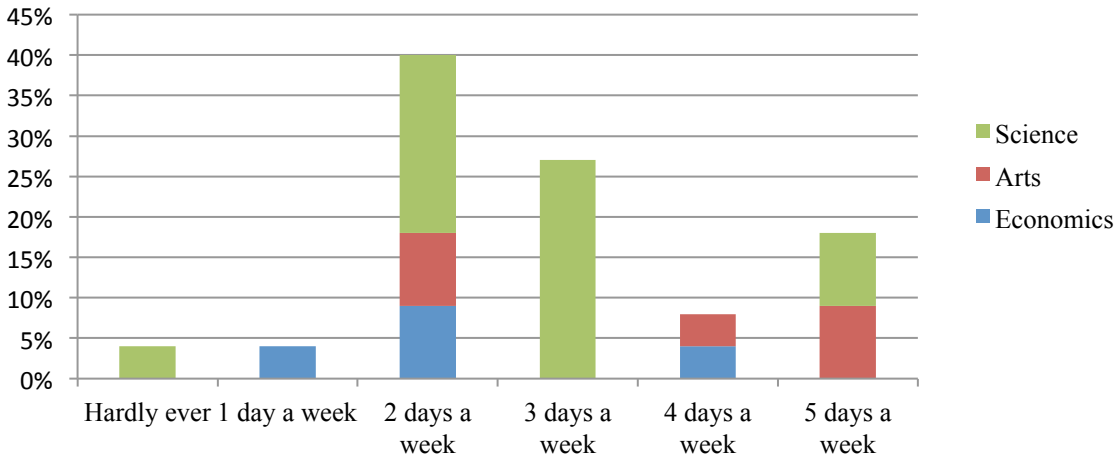
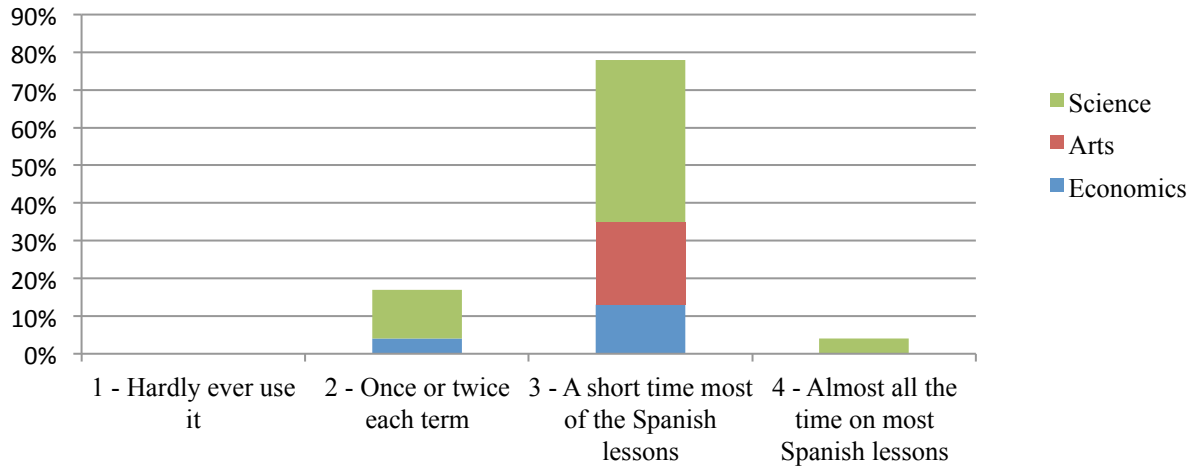


Diagram 5 - Frequency of computer use during lessons (all subjects)



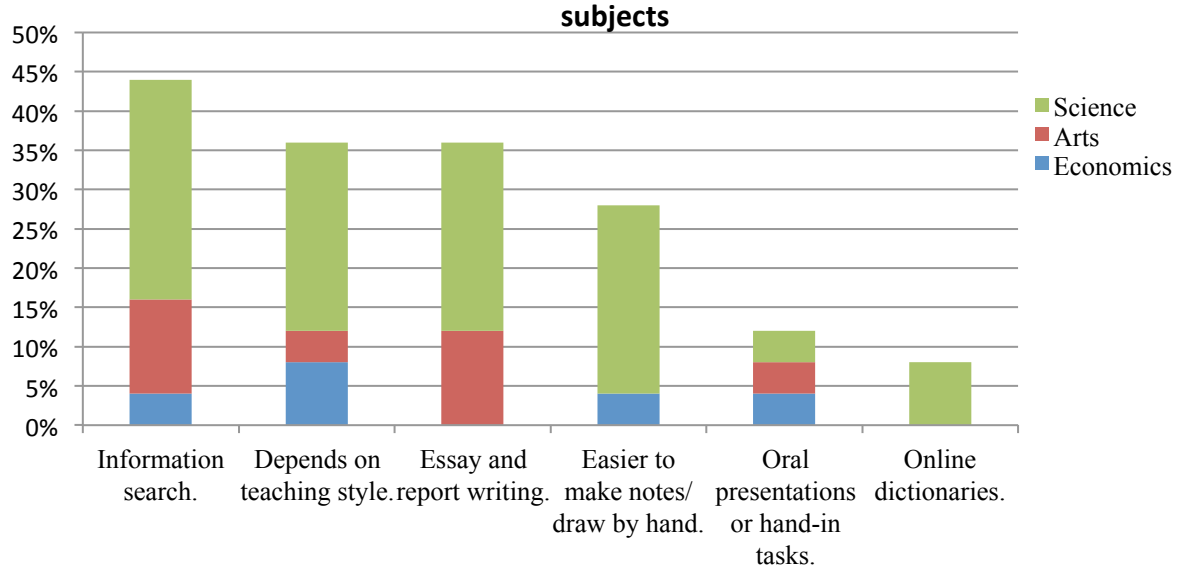
The pupils used computers mostly in language lessons and social sciences. Pupil 21 (Economics) commented that he hardly ever used the computer in any subject, except for oral presentations. He preferred to use his smartphone, as it can perform everything he needs during the lessons and is easier to carry around. He was not alone: most pupils used the computer regularly during Spanish lessons (Diagram 6), but 80% also used smartphones to look up words or other information. More pedagogical uses of the smartphone, such as applications for vocabulary practice or watching instructive videos, were rarely found.

Diagram 6 - Individually chosen computer use during Spanish lessons



Four main reasons to explain differences in computer use between subjects can be distinguished (Diagram 7). Languages and social sciences involve more information search and writing. Several pupils pointed out that it is more difficult in some subjects (mathematics, physics, and chemistry) than in others to make notes on the computer, as they require drawing of diagrams, graphs, etc. The computer use also seems to depend on teachers' preferences and ways of teaching (cf. Svärdhagen et al., 2011; Thullberg et al., 2009). Different schools seemingly have different ICT culture; especially the Economics pupils made little use of their computers. Whether this depends on teacher beliefs, lack of teacher training, or other factors, needs to be further investigated.

Diagram 7 - Reasons for differing computer use in different school subjects

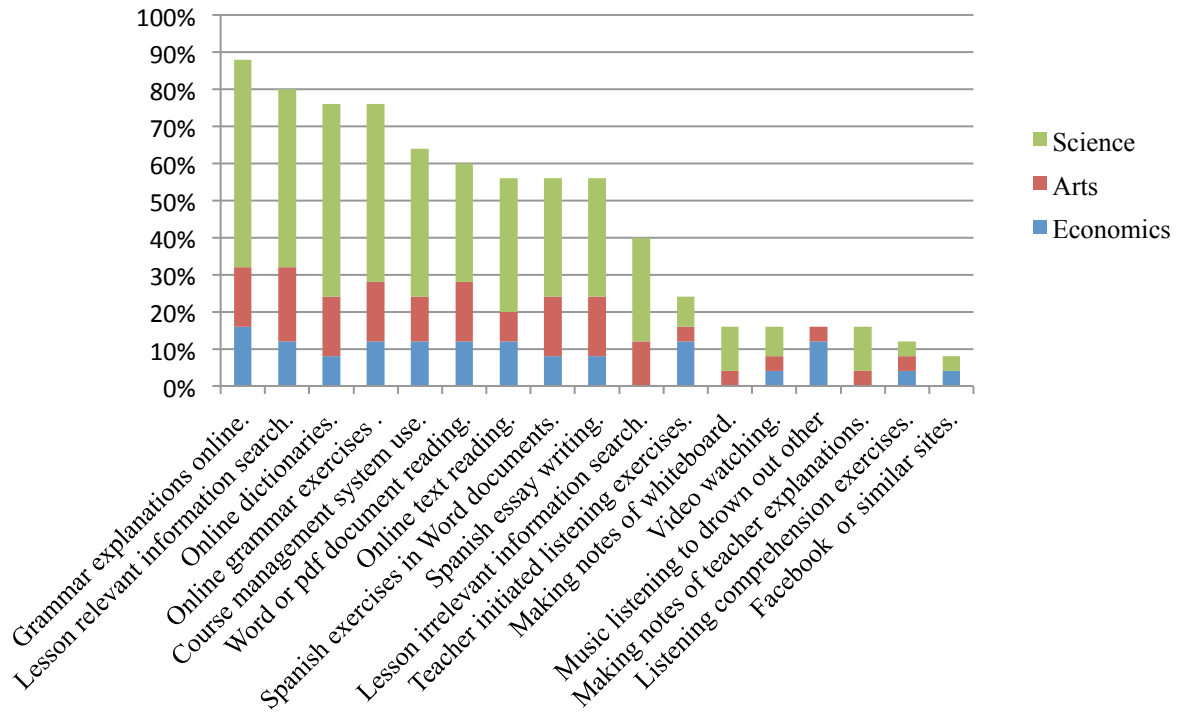


Some pupils did not clearly link their computer use to specific subjects, but rather stated personal reasons for (not) using the computer. Pupil 15 (Science) commented that she starts her computer only if the teacher says that it is going to be used during the lesson; she preferred not to use it as it makes her focus less on the lesson content. Pupil 18 (Science), showing a clear aversion to computers, stated that she chooses to use papers, unless the teacher tells her to use the computer. An Economics pupil (17) wrote that the computer makes storing information from the lessons easier. This can explain why she preferred to use the computer in subjects where the teachers give out digitalised information, but it does not explain why the computer use in those particular subjects is elicited by the teachers.

The pupils reported many uses of their computers during the Spanish lessons (Diagram 8). Facebook interaction, dreaded by many teachers, was scarce, although there was much "lesson irrelevant information search" going on, including looking at the online schedule, finding out what is for lunch, checking bus time tables etc. Again, reading, writing, searching for information and doing exercises were among the main areas of computer use; surprisingly, though, essay writing did not score higher. According to Warschauer et al. (2010), "the greatest impact of individual laptop use is on student writing" (p. 221).

Few pupils used the computer for making notes, and many expressed clearly that they saw great disadvantages in using the computer for this. (Only one pupil stated the opposite.)

Diagram 8 - Areas of computer use by pupils during Spanish lessons



Advantages and disadvantages of computer or pen/paper use

As shown in Diagram 9, the most useful use of the computer, according to the pupils, is for writing essays (although, as seen in Diagram 8, this use could increase among the participants). Almost half of the pupils saw online dictionaries as useful, and about a third mentioned grammar exercises and information search; even fewer online grammar explanations (they preferred explanations by the teacher). Only Economics pupils talked about the use of computers for oral presentations, with PowerPoint. Again, this might depend on different school or study programme cultures.

Diagram 9 - Perceived usefulness of computer use in Spanish lessons

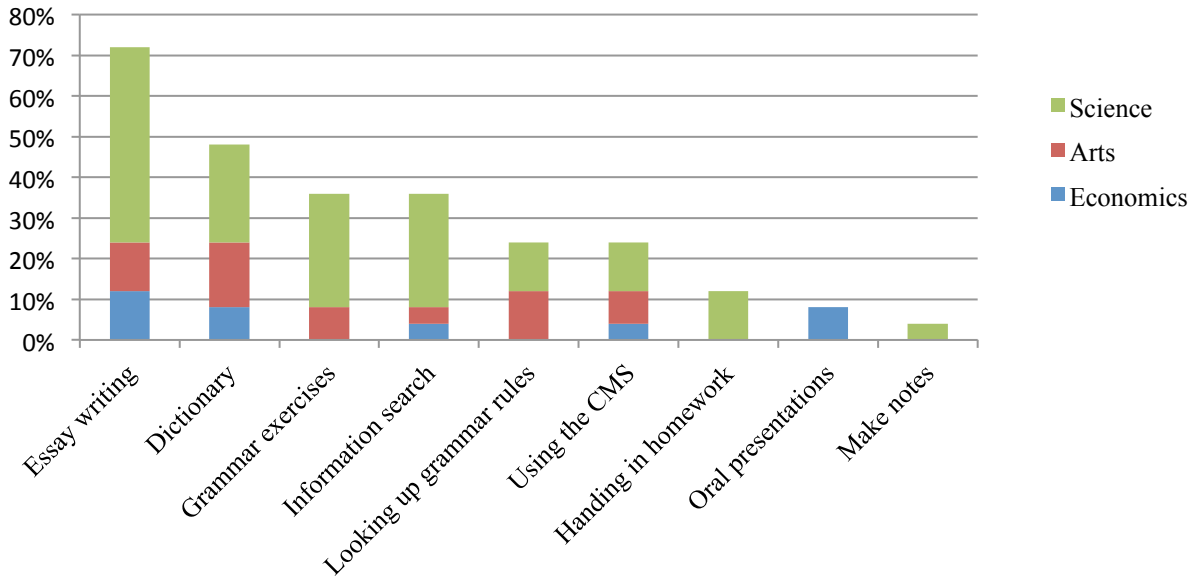
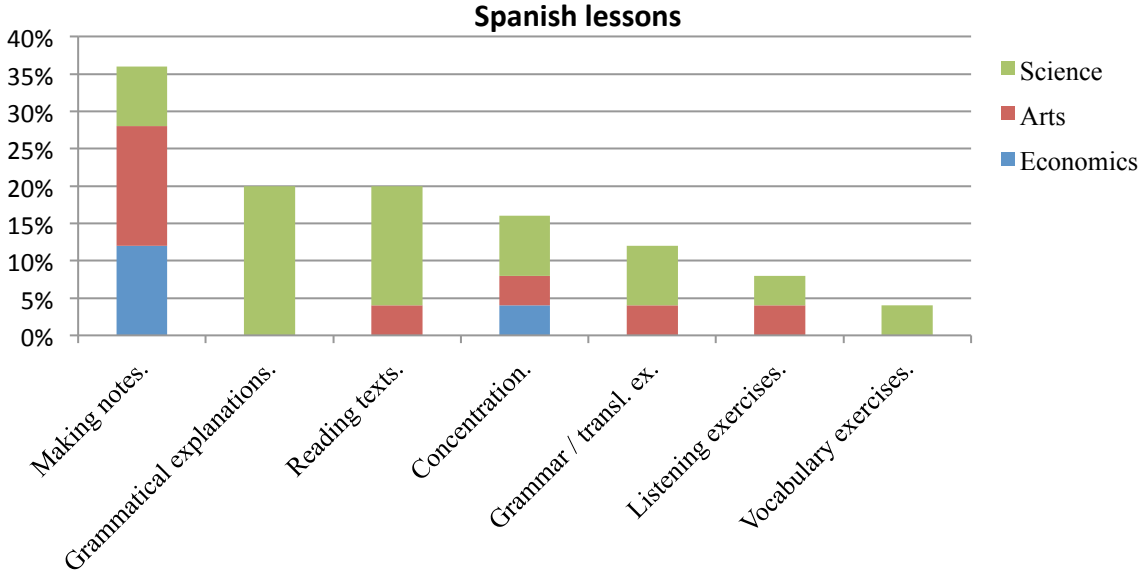


Diagram 10 shows the areas that the pupils did not see as good for computer use.

Diagram 10 - Perceived disadvantages of using computers in Spanish lessons

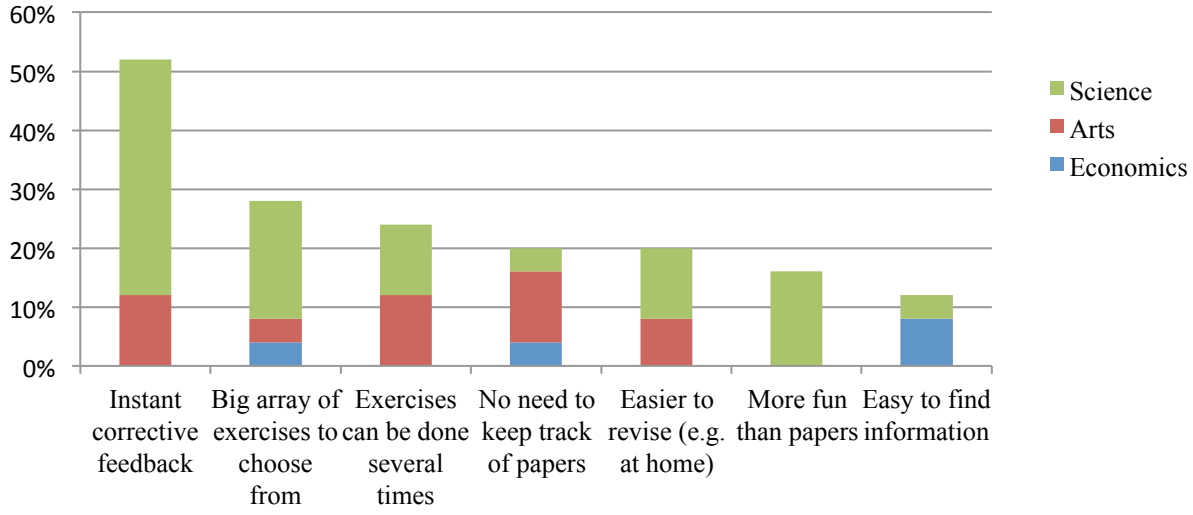


Making notes was repeatedly commented on in the questionnaire. Many pupils found it difficult to make notes on the computer, whereas only one preferred to use the computer. Teachers wishing to increase ICT use in their classes probably need to take this opinion into account and teach suitable techniques for making notes and filing them (be it on computers or by hand). Several pupils also wrote that they did not enjoy reading longer texts on the computer, as it was tiring for the eyes. Working on the computer was also seen as distracting by some pupils.

Grammar explanations are also an area not suitable for computer use, according to some pupils, who preferred teacher-led oral explanations at the whiteboard and/or individual explanations by their desks.

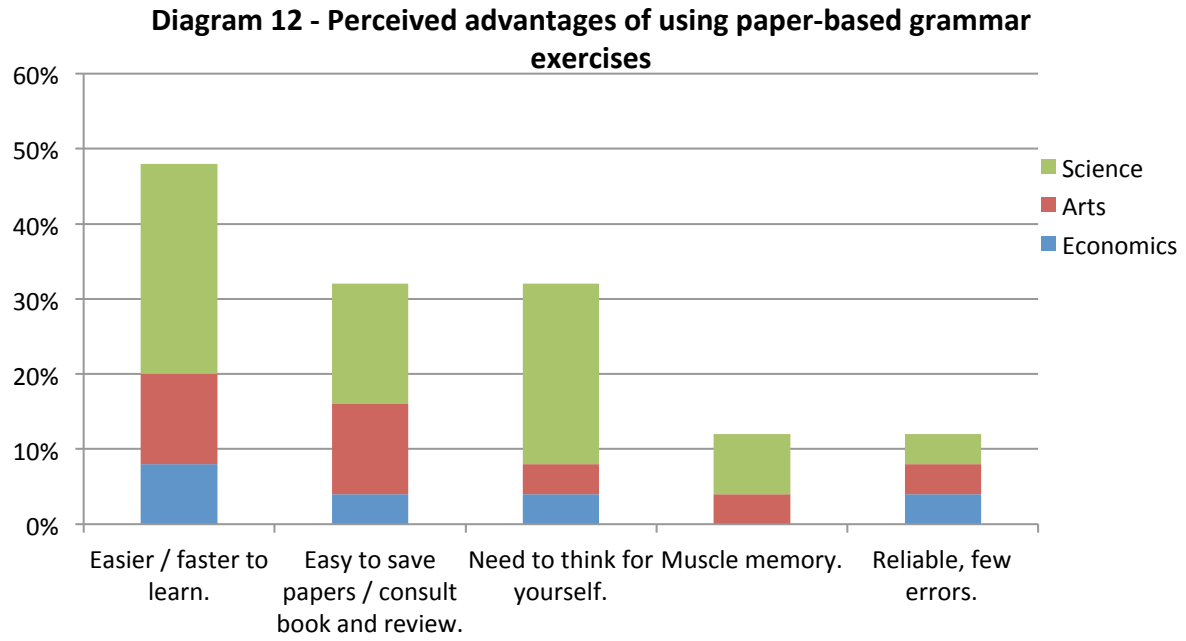
The major advantage of online Spanish grammar exercises (Diagram 11), according to many of the pupils, is the instant corrective feedback. One of the Science pupils also mentioned the spell checker function in Word as an advantage.

Diagram 11 - Perceived usefulness of using computers for Spanish grammar learning



In a study on electronic feedback and development of writing skills in a second language, Ware et al. (2006) conclude, though, that automated grammar feedback has unclear influences on students' writing skills. Pupils' reactions to this type of automated correction may be further researched. Many pupils enjoyed the automatic feedback but were aware of its drawbacks, and commented that without the automatic correction they were forced to think more for themselves, and performed the paper-based exercises with greater care.

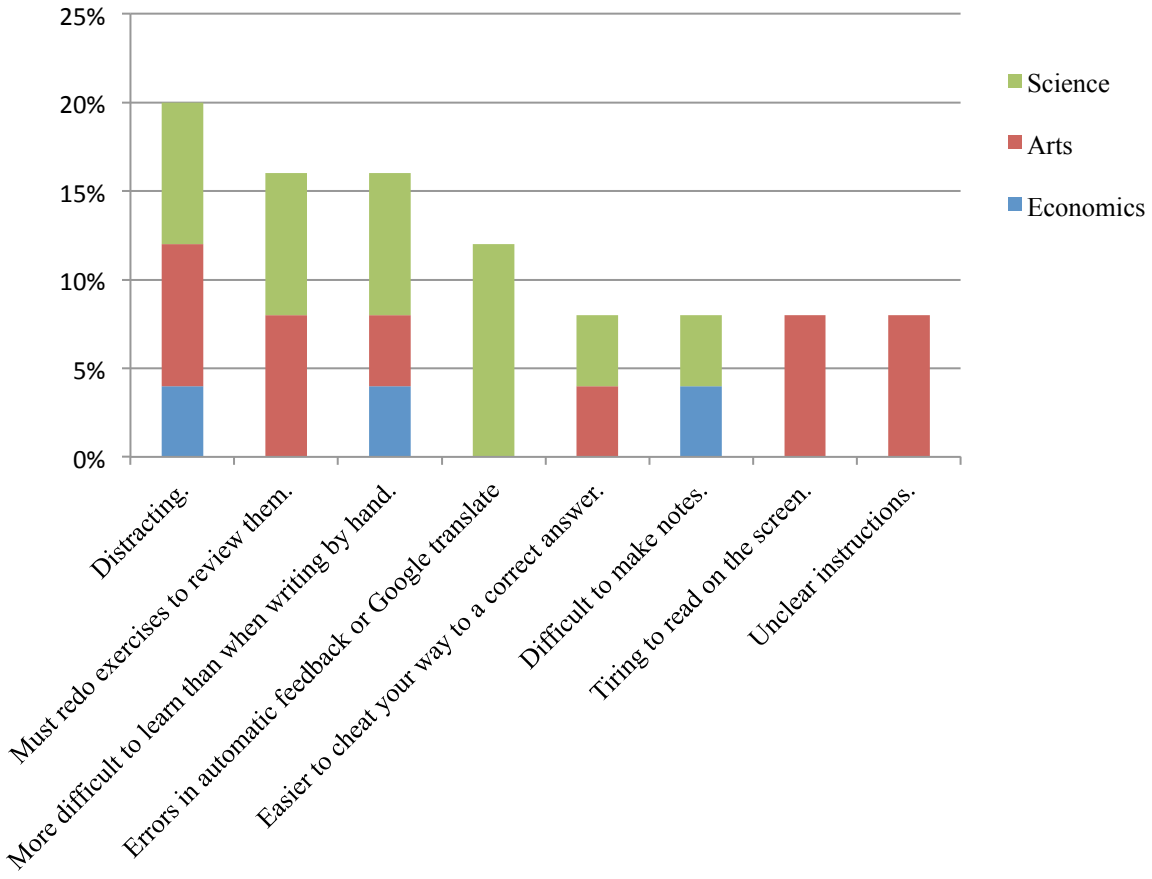
Features such as big variety of exercises to choose from and repeatability (without having to use an eraser) were also mentioned as advantages of computer-based exercises, as opposed to typical paper features (Diagrams 12 and 13).



Several pupils conveyed strong opinions on advantages of paper-based exercises. Pupil 9 (Science): "there's no automatic correction [and] you have to know what you're doing". Pupil 18 (Science): "you get a very concrete feeling, and it absolutely [enters] your brain a hundred per cent faster, when things are in paper-form. You can quickly ask the teacher or look things up on the internet if you've made a mistake." Pupil 14 (Science): "I feel that I learn the spelling better if I can write by hand instead of using the computer". Pupil 17 (Economics) also mentions spelling, and that it is an advantage to have to think for yourself instead of getting the correct spelling from the spell checker in Word. Pupil 16 (Arts) says, "I get a better feeling for the grammar when I write by hand" and "I also think it's important to keep writing by hand so that we don't lose it completely just because the computers soon take over".

Several pupils liked the auto-correction feature of many online exercises, but here, pupils 23 and 13 (Science) said that it is good for learning to have to do your own corrections or revisions.

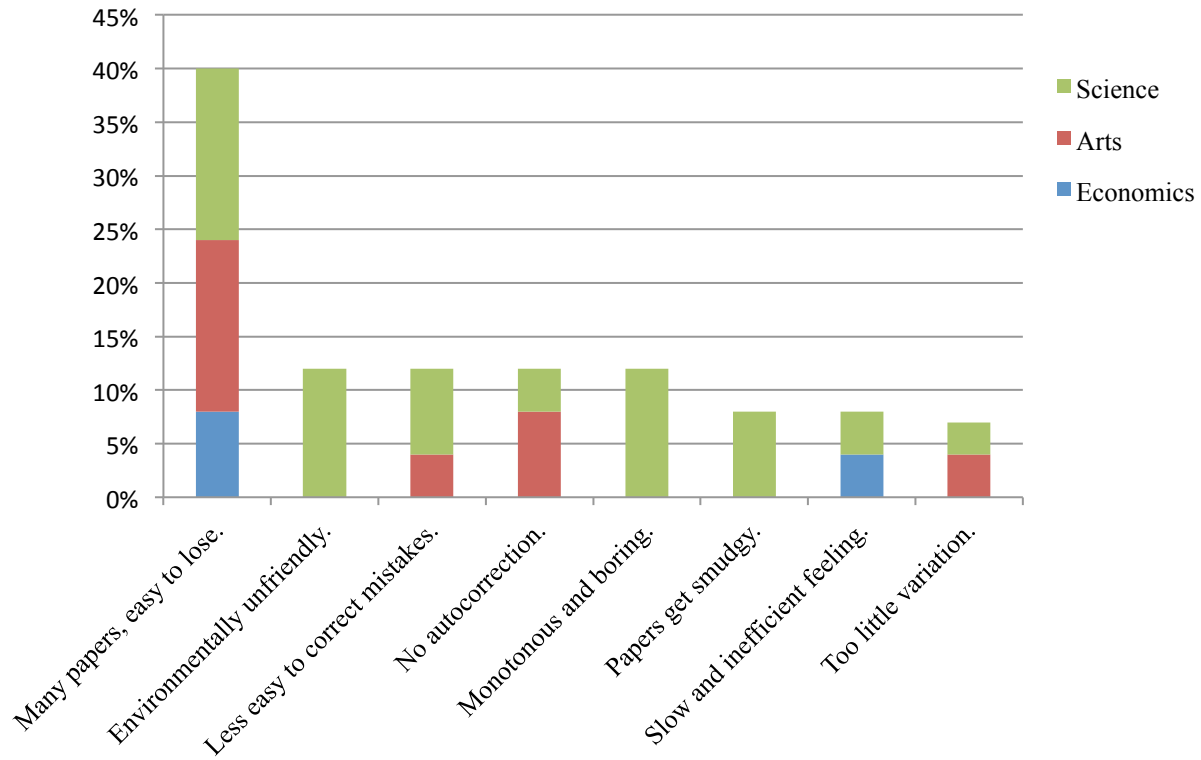
Diagram 13 - Perceived disadvantages of using computers for Spanish grammar learning



Some pupils mentioned the possibility to review online exercises at home as an advantage of computer-based exercises. Nevertheless, when it comes to perceived disadvantages of computer-based exercises (Diagram 13), several pupils pointed out that in order to review the content of many online exercises at a later occasion, they must do them all over again, something not needed with paper-based exercises. They also found computers distracting (either because they were tempted to do other things online, or because the exercises themselves were distracting due to bad structure, irrelevant pictures or other design flaws). Unclear grammar explanations or instructions can also be confusing and take attention away from the instructive purpose of the exercise – pupil 10 (Arts) explained how she sometimes focused more on the exercise layout than on its content. To cite Brett et al. (2011), "Teaching material's design stands out as one of the important questions for pupils, both in paper format and online".

Errors in feedback, online dictionaries or translation sites also annoyed the pupils. Pupil 18 (Science), wrote, “Google translate [...], it’s the worst thing I know! Many times it absolutely doesn’t work; many times the sentences are incorrectly constructed. I prefer to think for myself!”. Discussing advantages and drawbacks of using interactive whiteboards and multimedia in language classrooms, Cutrim Schmid (2008) raise similar thoughts among pupils, pointing out that the technology does provide them with easy answers but makes them think less for themselves, thus not evolving their imagination or learning strategies.

Diagram 14 - Perceived drawbacks of using paper-and-pen grammar exercises



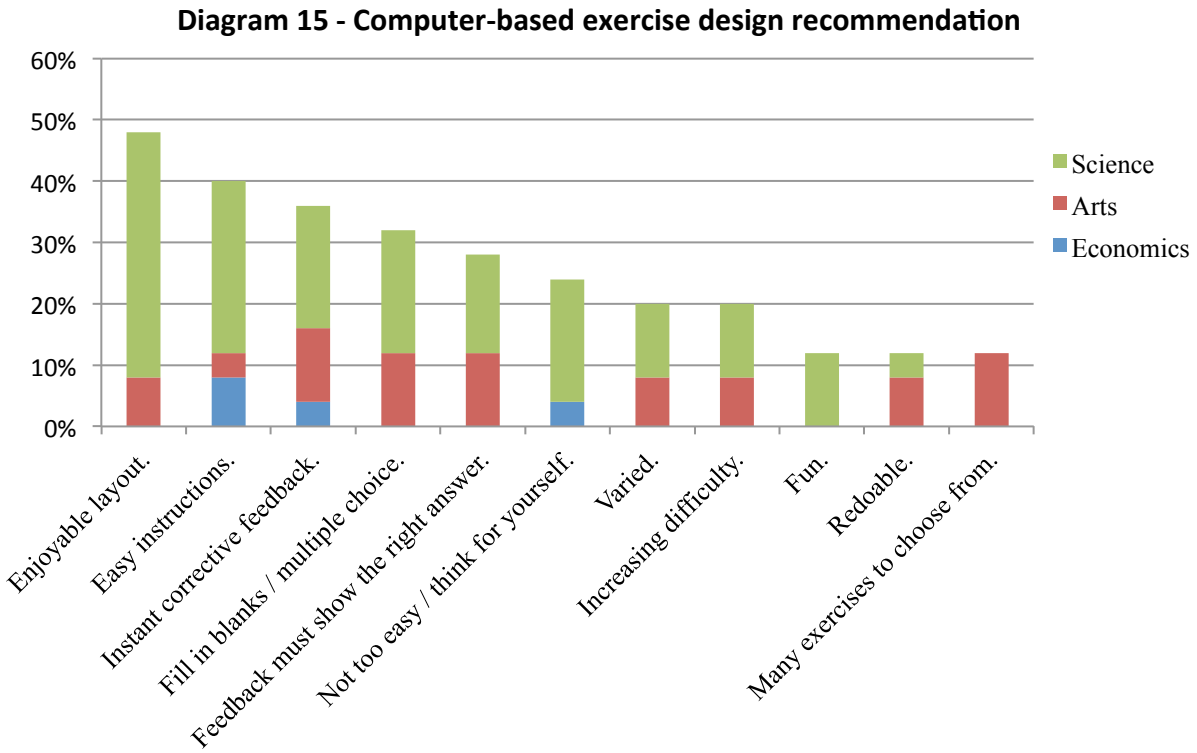
Many pupils saw the fact that papers are easy to lose or forget as the main drawback of paper-based exercises (Diagram 14). Pupil 10 (Arts) pointed out, however, that it is up to the pupil not to lose papers and that he/she can purchase a loose-leaf binder.

Pupil 20 (Science) found it boring to correct the exercises manually, saying that this leads to not doing any corrections and thus not learning as much. Pupil 11 (Arts) had similar thoughts and

mentioned that manual corrections are time consuming. Pupil 23 (Science) also thought that paper-based exercises are boring, since "most of the things you do at school are done in paper-form", and she said that this made her less focused. Pupil 12 (Arts) said that paper-based exercises generally are less individualised.

Recommendations for the use of computers or paper and pen

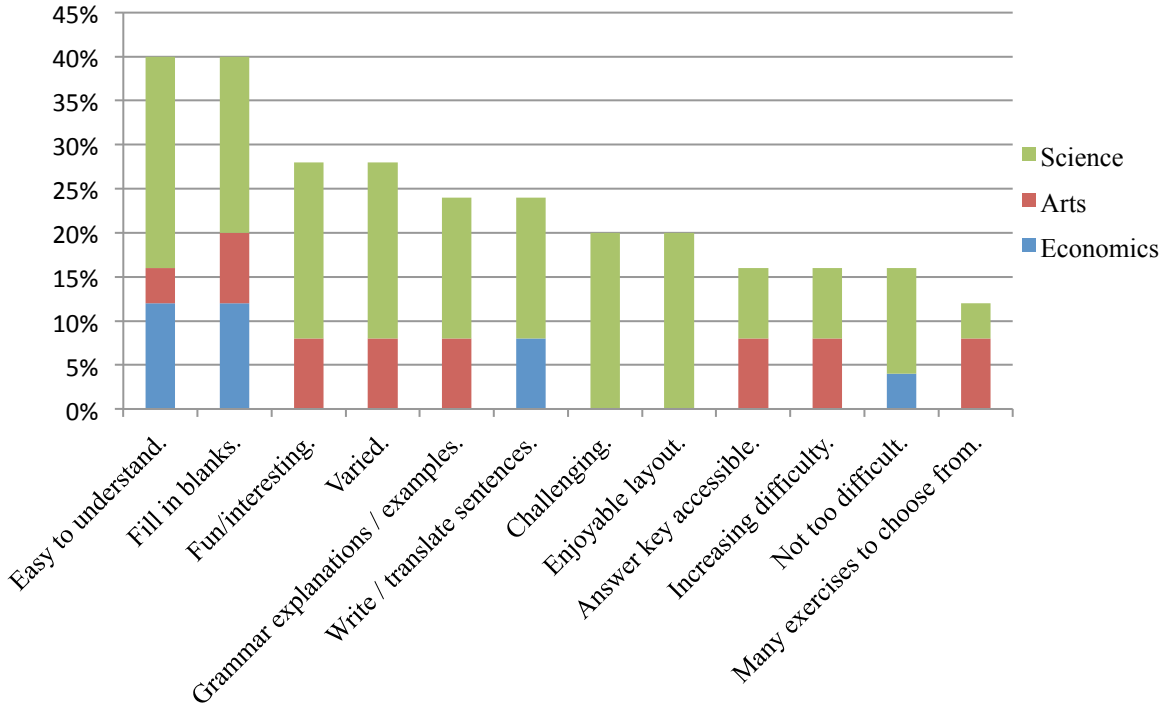
The pupils' most frequent recommendations for computer-based grammar exercises design (Diagram 15) focus on layout, instructions and feedback. The design of exercises influenced greatly on several pupils' opinions on whether they were useful (cf. Brett et al., 2011). The researcher could arguably have found better exercises; however, as mentioned before, efforts were made not only to find exercises with a clear layout and a well thought-out instructional purpose, but also to choose material reflecting what is actually used and easily accessible for teachers.



Again, many pupils appreciated the instant corrective feedback. However, automated correction might be most appropriate as a complement to traditional corrections, as the interactive parts of ordinary feedback from a teacher ought not be underestimated (Ware et al., 2006). Several pupils stressed that the automatic correction is only useful if the feedback is correct (which was not always the case), and if it is not too "picky", i.e. that variations or synonyms should be allowed.[6]

The most frequent recommendations for design of paper-based grammar exercises are shown in Diagram 16.

Diagram 16 - Paper-based exercise design recommendations



The diagram sums up some of the main points of the questionnaire and the diaries: pupils prefer varied learning material, with well-structured and easily understood exercises that force them to use their mental capacities, providing them with good explanations of the grammar to learn. They like "fill-in-the-blanks", although not few pupils expressed the feeling that they learn more, better or faster when writing by hand (making notes, doing exercises, translating, writing essays) as this

[6] A good example is an exercise asking pupils to conjugate verbs in the "you"-form. Spanish has five verb endings translatable as "you". Erroneous corrections were not uncommon.

makes them think more. The pupils also asked for more written exercises, computerised or by hand, such as translations and essay writing.

Conclusions and discussion

The main research questions in the present study were:

- When do pupils see computers as an appropriate tool for learning Spanish grammar?
- When do they not see them as appropriate?
- What didactic and scientific implications can be drawn from these results?

To the pupils, some things seem more important than others in computer-based grammar exercises: the corrective feedback (preferably instant, but not too picky; it must on the other hand make no mistakes); the interface design (not confusing or distracting, and providing clear instructions). Many of the participants, thus, enjoyed online grammar exercises, if they are well structured, instructive and provide accurate automatic corrective feedback with explanations to the errors. If these wishes for online exercises design are to be met, teachers (and/or pupils) need to be able to modify the exercises, as much of the available material is poorly constructed (Pegrum, 2009; Kervin et al., 2011; Motteram, 2011). The question is whether teachers are – or feel – competent to do so, and if they can find the time for it. If Tomlinson (2011) is correct that these kinds of auto-corrected exercises function best for pupils who learn easily on their own, but less for others who need more teacher explanations, schools need to be aware and not put too much faith in them.

Rosen (2010) writes that pupils "thrive on multimedia, multitasking, social environments for every aspect of their lives *except* education" and that "we must find new tools to engage our students and help them learn in ways that work for them and for teachers" (pp. 3 – 5). The present study contradicts this somewhat, as the participants appreciated traditional learning and teaching

styles when they were challenging and well thought-through. One might ask, as Roszak (1994), if "the curriculum [is] to adapt to the computer, or the computer to the curriculum?" (p. 52).

The participating pupils saw computers as useful for writing essays, searching for information and using online dictionaries. These might be the areas of language instruction most suitable for ICT-based learning. As for online dictionaries, it is important that pupils learn how to use them (as well as printed dictionaries), and which ones are reliable. School authorities should invest in good digital dictionaries – probably also for mobile phones – rather than suggest that teachers and pupils rely on non-cost online alternatives. The results of Chiu et al. (2013), finding that the retention of new words is better when pupils have used printed dictionaries, compared to electronic versions of the same dictionaries, ought probably to be taken into account as well.

Most of the pupils saw computers as less useful for making notes. Teachers may teach them better ways to make notes and to file information, if it is desirable that computers be used more. Considering, however, that not few pupils stated clearly that they learn more easily and retain the knowledge better when writing by hand, schools should ask themselves whether computer use is more important than pupils' learning. An open dialogue in the language classroom on learning methods and their advantages or disadvantages may be recommended.

Further research suggestions

The present study does not claim to provide any absolute answers to how or when to use ICT-based teaching methods in the language classroom, but indicates, nevertheless, several paths to follow in future research and for teachers to consider in their daily teaching practice. The field of teaching material design would benefit from further studies, especially comparing the effects of different designs on pupils' attitudes and reactions and the way the design influence on pupils'

interactions with the exercises and their experienced learning outcome.[7] Multimodal studies could further elucidate how pupils interact with different learning methods in the language classroom, and for what purposes.

Further studies on how pupils use and perceive automated corrective feedback would be interesting, especially in the context of vocabulary and grammar practice, where few studies have been conducted. Compared outcomes of vocabulary and grammar learning using online exercises and exercises written by hand would be of great interest.

Another perspective benefiting from further studies might be the opposite of the one adopted here: teacher incentives to use ICT in the language classroom. Which ICT practices do teachers choose (or not choose), and why? Mechanisms directing teachers' choice of teaching methods are highly interesting in an era where ICT is often seen as the big promising solution to declining pupil performances. Are choices consciously made or do schools succumb to prevailing ideas and computer company lobbyists?

[7] It is very difficult to evaluate actual learning outcome of a given modality or technique, considering the many other factors involved in any learning situation. Experienced learning outcome may on the other hand have much to say about the appropriateness of different teaching methods.

References

AlAmmary, Jaflah (2012), Educational Technology: A Way to Enhance Student Achievement at the University of Bahrain. *3rd. International Conference on New Horizons in Education - INTE 2012*, 55: 248–257.

Andersson, Patrik (2010), IKT i skolan. En studie rörande gymnasieelevers attityder till IKT i undervisningen. Växjö: Linnéuniversitetet, Institutionen för pedagogik, psykologi och idrottsvetenskap.

Ayres, Robert (2010), Learner Attitudes Towards the Use of CALL. *Computer Assisted Language Learning*, 15(3): 241 – 249.

Brett, David and González-Lloret, Marta (2011), Technology-Enhanced Materials, 351 – 369, in: Long, M. H. and Doughty, C. J. (Eds.), *The Handbook of Language Teaching*. Malden; Oxford; Chichester: Wiley-Blackwell.

Buskqvist, Ulf and Molin, Lennart (2011), *Forskningsanknytning och IKT - Röster från lärarutbildningen vid Karlstads universitet*. Karlstad: Karlstads universitet, Estetisk-filosofiska fakulteten, pedagogik.

Cavus, Nadire and Kanbul, Sezer (2010), Designation of Web 2.0 Tools Expected by the Students on Technology-based Learning Environment. *Innovation and Creativity in Education*, 2(2): 5824–5829.

Chapelle, Carol A. (2011), Computer-Assisted Teaching and Testing, 628 – 644, in: Long, M. H. and Doughty, C. J. (Eds.), *The Handbook of Language Teaching*. Chichester: Wiley-Blackwell.

Chiu, Li-Ling and Liu, Gi-Zen (2013), Effects of Printed, Pocket Electronic, and Online Dictionaries on High School Students' English Vocabulary Retention. *The Asia-Pacific Education Researcher*. Retrieved February 04, 2014, from http://link.springer.com/article/10.1007%2Fs40299-013-0065-1

Cobo Romaní, Cristóbal and Moravec, John W. (2011), *Aprendizaje Invisible. Hacia una nueva ecología de la educación.* Barcelona: Col·lecció Transmedia XXI. Laboratori de Mitjans Interactius / Publicacions i Edicions de la Universitat de Barcelona.

Council of Europe (2001), The Common European Framework for Language Learning. Retrieved February 04, 2014, from http://www.coe.int/t/dg4/education/elp/elp-reg/Source/Key_reference/CEFR_EN.pdf

Cutrim Schmid, Euline (2008), Potential Pedagogical Benefits and Drawbacks of Multimedia Use in the English Language Classroom Equipped with Interactive Whiteboard Technology. *Computers & Education*, 51(4): 1553–1568.

Davis, F. D. (1989), Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3): 319 – 339.

Drucker, Peter (1959), *The Landmarks of Tomorrow*. Heinemann.

Dörnyei, Zoltán (2010), *Questionnaires in Second Language Research: Construction, Administration, and Processing*. New York: Routledge.

Dörnyei, Zoltán and Ushioda, Ema (2011), *Teaching and Researching Motivation*. Harlow: Pearson Education Limited.

Edmunds, Rob, Thorpe, Mary and Conole, Grainne (2012), Student Attitudes Towards and Use of ICT in Course Study, Work and Social Activity: A Technology Acceptance Model Approach. *British Journal of Educational Technology*, 43(1): 71–84.

Enkvist, Inger (2002), *Feltänkt. En kritisk granskning av idébakgrunden till svensk skolpolitik*. Stockholm: SNS Förlag.

Enkvist, Inger (2011), *La buena y la mala educación: Ejemplos internacionales*. Madrid: Encuentro.

Granath, Solveig and Estling Vannestål, Maria (2008), IKT i språkundervisningen i teori och praktik, in: *Fönster mot språk och litteratur*. Karlstad: CSL (Centrum för Språk- och litteraturdidaktik.

Grönwald, Bo (1999a), *Övningar i spansk grammatik - Del 1*. Kolmården: EntreVista Läromedel.

Grönwald, Bo (1999b), *Övningar i spansk grammatik - Del 2*. Kolmården: EntreVista Läromedel.

Hegelheimer, Volker and Fisher, David (2006), Grammar, Writing, and Technology: A Sample Technology-supported Approach to Teaching Grammar and Improving Writing for ESL Learners. *CALICO JOURNAL*, 23(2): 257.

Kahraman, Sakıp, Çevik, Ceren and Kodan, Hülya (2011), Investigation of University Students' Attitude Toward the Use of Powerpoint According to Some Variables. *World Conference on Information Technology*, 3: 1341–1347.

Karlstads kommun (2012), Karlstads internationella TIME-utbildning (NAES). Retrieved February 04, 2014, from http://karlstad.se/afiler/Programblad/TIME2012%20liten%20storlek.pdf

Kern, Richard (2006), Perspectives on Technology in Learning and Teaching Languages. *TESOL Quarterly*, 40(1): 183 – 210.

Kervin, Lisa and Derewianka, Beverly (2011), New Technologies to Support Language Learning, 328 – 351, in: Tomlinson, B. (Ed.), *Materials Development in Language Teaching*. Cambridge: Cambridge University Press.

Kroksmark, Tomas (2006), Innovativt Lärande. *Didaktisk tidskrift*, 16(3): 7–22.

Lannvik Duregård, Maria (2010), Moderna språk - ämnen i kris. *Lärarnas Nyheter*. Retrieved February 04, 2014, from http://www.lararnasnyheter.se/alfa/2010/04/15/moderna-sprak-amnen-kris

Larsson, Staffan (1986), *Kvalitativ analys - exemplet fenomenografi*. Lund: Studentlitteratur.

Lim, Kang-Mi and Shen, Hui Zhong (2006), Integration of Computers into an EFL Reading Classroom. *ReCALL*, 18(2): 212 – 229.

Longcamp, Marieke, Boucard, Céline, Gilhodes, Jean-Claude, Anton, Jean-Luc, Roth, Muriel, Nazarian, Bruno and Velay, Jean-Luc (2008), Learning through Hand-or Typewriting Influences Visual Recognition of New Graphic Shapes: Behavioral and Functional Imaging Evidence. *Journal of Cognitive Neuroscience*, 20(5): 802–815.

Lund, Stefan (2006), Marknad och medborgare: elevers valhandlingar i gymnasieutbildningens integrations- och differentieringsprocesser.

Lund, Stefan (2007), Valfrihet och konkurrens: Utvecklingstendenser inom gymnasieutbildningen. *Pedagogisk forskning i Sverige*, 12(4): 281–300.

Motteram, Gary (2011), Developing Language-learning Materials with Technology, 303 – 327, in: Tomlinson, B. (Ed.), *Materials Development in Language Teaching*. Cambridge: Cambridge University Press.

Nutta, Joyce (1998), Is Computer-based Grammar Instruction as Effective as Teacher-directed Grammar Instruction for Teaching L2 Structures? *Calico Journal*, 16(1): 49 – 62.

Odlander, Johanna (2007), Uppsalaskolor lockar elever med resor. *UNT.se*. Retrieved February 04, 2014, from http://www.unt.se/inc/print/uppsalaskolor-lockar-elever-med-resor-300098-default.aspx

OECD (2008), New Millennium Learners. Initial Findings on the Effects of Digital Technologies on School-age Learners. Retrieved February 04, 2014, from http://www.oecd.org/dataoecd/39/51/40554230.pdf

Pegrum, M. (2009), *From Blogs to Bombs*. Crawley, Western Australia: University of Western Australia Press.

Rosen, Larry D. (2010), *Rewired: Understanding the iGeneration and the Way They Learn*. New York: Palgrave Macmillan.

Rosén, Monica (2012), Förändringar i läsvanor och läsförmåga bland 9- till 10-åringar. Resultat från internationella studier, 111 – 139, in: *Läsarnas marknad, marknadens läsare – en forskningsantologi SOU 2012:10*. Stockholm: SOU.

Roszak, Theodore (1994), *The Cult of Information. A Neo-Luddite Treatise on High-Tech, Artificial Intelligence, and the True Art of Thinking*. New York: Pantheon.

Skolverket (2013), Om ämnet Moderna språk. Retrieved February 04, 2014, from http://www.skolverket.se/

Svensson, Patrik (2008), *Språkutbildning i en digital värld Informationsteknik, kommunikation och lärande*. Norstedts Akademiska Förlag.

Svärdhagen, Jan and Embretsén, Eva-Lena (2011), *Nästa generations lärande. Högskolan Dalarna: IT och lärande i PUD-regionens kommuners förskolor och skolor*. Högskolan Dalarna.

Tallvid, Martin and Hallerström, Helena (2009), *En egen dator i skolarbetet – redskap för lärande? Utvärdering av projektet En-till-en i två grundskolor i Falkenbergs kommun. Delrapport 2.* Falkenbergs kommun: Barn-och utbildningsförvaltningen.

Thullberg, Per and Szekely, Christina (2009), *Redovisning av uppdraget att bedöma verksamheters och huvudmäns utvecklingsbehov avseende IT-användningen inom förskola, skola och vuxenutbildning samt ge förslag på insatser*. Stockholm: Skolverket.

Tomlinson, Brian (2011), Access-self Materials, 414 – 432, in: Tomlinson, B. (Ed.), *Materials Development in Language Teaching*. Cambridge: Cambridge University Press.

Usta, Ertugrul (2011), The Effect Of Web-Based Learning Environments On Attitudes Of Students Regarding Computer And Internet. *World Conference on Educational Technology Researches - 2011*, 28: 262–269.

Vanäs Hedberg, Margareta, Herrador Quero, Elvira and Vaccia Izami, Sylvia (2008), *Alegría Paso cuatro*. Stockholm: Liber.

Ware, Paige D. and Warschauer, Mark (2006), Electronic Feedback and Second Language Writing, 105 – 123, in: Hyland, K. and Hyland, F. (Eds.), *Feedback in Second Language Writing: Contexts and Issues*. Cambridge: Cambridge University Press.

Warschauer, Mark (1996), Motivational Aspects of Using Computers for Writing and Communication, 29 – 46, in: *Telecollaboration in foreign language learning: Proceedings of the Hawai'i symposium.* Technical Report. Honolulu, Hawai'i: University of Hawai'i, Second Language Teaching & Curriculum Center.

Warschauer, Mark, Arada, Kathleen and Zheng, Binbin (2010), Laptops and Inspired Writing. *Journal of Adolescent & Adult Literacy*, 54(3): 221 – 223.

Velay, Jean-Luc, Longcamp, Marieke and Zerbato-Poudou, Marie-Thérèse (2004a), De La Plume Au Clavier: Est-il Toujours Utile D'enseigner L'écriture Manuscrite. *Comprendre les apprentissages: Sciences cognitives et éducation*: 69–82.

Velay, Jean-Luc, Longcamp, Marieke and Zerbato-Poudou, Marie-Thérèse (2004b), Le stylo et le clavier. Notre mode d'écriture influence-t-il notre perception de l'écrit ? *Langues et écritures*: 37 – 54.

Wiebe, Grace and Kabata, Kaori (2010), Students' and Instructors' Attitudes Towards the Use of CALL in Foreign Language Teaching and Learning. *Computer Assisted Language Learning*, 23(3): 221 – 234.

Zucker, Andrew A. and McGhee, Raymond (2005), *A Study of One-to-One Computer Use in Mathematics and Science Instruction at the Secondary Level in Henrico County Public Schools*. SRI International.

Online resources:

http://cvc.cervantes.es/ensenanza/actividades_ave/aveteca.htm

http://www.itslearning.com

http://www.ver-taal.com

Teaching Improvement Model Designed with DEA Method and Management Matrix.

Bernard Montoneri

Abstract

This study uses student evaluation of teachers to design a teaching improvement matrix based on teaching efficiency and performance by combining management matrix and data envelopment analysis. This matrix is designed to formulate suggestions to improve teaching. The research sample consists of 42 classes of freshmen following a course of English in Taiwan. The empirical findings show that proposed model can distribute all the evaluated classes into 4 quadrants depending on their performance and efficiency, identify the importance of each performance indicator, and suggest the improvement direction in different quadrants for all the evaluated classes. A study case of one inefficient class is presented in order to demonstrate the proposed model utility and feasibility.

Keywords: Data envelopment analysis; Teaching improvement matrix; Evaluation of teaching; teaching performance and efficiency.

Introduction

Students' evaluation of teaching (SET) has become, over the years, one the most important measures of teaching quality and performance in universities of Taiwan. An increasing number of higher education institutions (HEIs) use online and anonymous SET to evaluate educators. In the current system in Taiwan, SET typically occurs at the end of the semester and teachers receive the results during the vacation or at the beginning of the following semester. However, the results of SET can provide detailed and applicable suggestions neither to educators who wish to improve their teaching, nor to administrators who want to guide and encourage educators. Therefore, this study addresses the issue of improving classroom teaching from the viewpoint of first line educators and administrators and tries to provide a systematic procedure which combines the well-know concept of matrix in the field of management and data envelopment analysis (DEA), a famous quantitative evaluation method which has already been applied to various fields. Under DEA model, efficiency is relative to the other evaluated units in the same group. Montoneri et al. (2011) showed that some units may obtain a high performance but a low relative efficiency, and vice versa. This ambiguous and disturbing situation needs to be addressed and explained. By consequence, this paper presents a new teaching improvement matrix based on teaching efficiency and performance and develops teaching improvement procedures in order to formulate concrete suggestions. An empirical analysis is conducted to test the applicability of the proposed model.

The research data consist of 42 classes of freshmen following a course of English in a university of Taiwan during the academic year 2004 and 2005. Two inputs (teaching clarity and teaching enthusiasm) and two outputs (students' learning interest and students' satisfaction about grades) are used in this study because they are highly correlated. The four indicators selected here demonstrate the utility and feasibility of the model. Other and more indicators could be selected

as long as they show a high degree of correlation. This paper not only conducts a general analysis of the 42 classes, but also presents the case study of one inefficient class, that is, C30.

Literature review

Students' evaluation of teaching

Stronge (1997) and Theall & Franklin (2000) identified SET as the most frequently studied aspect of education. Most HEIs use student ratings as a measure of teaching quality and performance (Cashin, 1999; Zabaleta, 2007). According to Wilson (1997), around 2,000 studies were conducted on SET in the 20th century. Various studies show that SET are used for both formative (for teachers to improve teaching) and summative (for administrators to monitor quality) reasons (Edström, 2008; Arthur, 2009). A large number of studies focused primarily on the validity of SET (Marsh, 1987, 2007; Wachtel, 1998), and even though some scholars identify possible biasing factors (Marsh & Roche, 1987; Huston, 2005; Al-Issa & Sulieman, 2007), most publications agree that SETs are useful to both teachers and administrators. Following Marsh (1987), who states that the central purpose guiding student evaluations of professors should be to provide feedback for the improvement of teaching, we provide, in our study, concrete advices for educators to improve their teaching. Penny (2003) for example considers that SETs research has yet to consider seriously that student ratings are an interaction between the students' own conception of learning and the teaching process. In our study, the selected indicators reflect students' perception of good teaching (for example, students' perception of fairy grading). An increasing number of HEIs use online SET to evaluate teachers. Sorensen and Johnson (2004) edited a publication focusing on how online SET was used to evaluate both on-campus and online classes. Carle (2009) analyzed student perceptions of teaching effectiveness across time for face-to-face and online courses. There is a trend in HEIs to increase the use of the Internet in conducting SET (Achtemeier, Morris, & Finnegan, 2003; Harrington & Reasons, 2005). Many universities tend to prefer online, anonymous and confidential end-of-term course evaluation.

There are obviously many advantages in implementing online ratings: significant cost savings (Bothell & Henderson, 2003), improved turnaround time (Sorenson & Reiner, 2003), and greater convenience for students to respond without using valuable class time (Hmieleski & Champagne, 2000; Sorenson & Johnson, 2004). In order to measure teaching effectiveness, various indicators have been tested and studied. Montoneri et al. (2012) review the literature in detail and list all the indicators used in studies from various countries such as China, Taiwan, the UK, the US, and Spain (notably from page 384 to 387). Some indicators such as communication skills, attitude toward the student, knowledge of the subject, organizational skills, enthusiasm, fairness, flexibility, and encouragement of the student are identified as strongly related to teaching effectiveness (Kim et al., 2000).

Efficiency assessment using data envelopment analysis

Efficiency can be assessed by applying various quantitative evaluation methods such as stochastic frontier analysis (SFA), regression, statistics, ordinary least-squares (OLS), structural equation modeling (SEM), data envelopment analysis (DEA), and multi-level modeling (MLM). Which method is more appropriate depends on the research environment (Ferrier & Knox Lovell, 1990). DEA is an attractive tool because it can measure the performance of educational institutions, departments and courses (Montoneri et al., 2011; Montoneri et al., 2012). DEA model evaluates the relative efficiency of each decision making units (DMUs) within a sample (Samoilenko & Osei-Bryson, 2008) and can receive multiple inputs and produce multiple outputs (Lee, 2009; Lin et al., 2009). There is a large body of literature concerning DEA. Among the most influential studies, Førsund & Sarafoglou (2002) cite Farrell's seminal 1957 paper on concepts of efficiency and the study published by Charnes, Cooper, & Rhodes (1978), which was particularly influential in developing and expanding Farrell (1957). Their model, called the "Charnes-Cooper-Rhodes (CCR) model" or "CCR model", notably includes the function and concept of benchmarking. According to Johnes (2006), the multiple input and output nature of

production in HEIs makes DEA rather than SFA the ideal choice of method in this context. Many studies assess the efficiency of universities (Ng & Li, 2000; Abbott & Doucouliagos, 2003; Johnes, 2006) and university departments (Colbert, Levary, & Shaner, 2000; Martin, 2006). Even though many scholars apply statistical analysis or qualitative methods to assess the performance of various courses (Leshem & Bar-Hama, 2008; Richards, 2010), there is a growing trend to use DEA (McGowan & Graham, 2009; Montoneri et al., 2011; Montoneri et al., 2012).

Various applications of management matrix

A number of studies have designed two-dimensional, categorical conceptions of performance quality collectively called management matrices; these matrices have been found to be useful in understanding and improving a variety of job performances. Management matrix was first implemented in the aerospace industry at the end of the 1950s. In the 1960s, Professor Allan Pred criticized normative location theories and introduced the concept of the behavioral matrix in connection with a theory of behavior and location (Pred, 1967). Davis & Lawrence (1977) showed that a matrix organization could include various organizing principles such as function, product, and area. Selby (1987) proposed to use Pred's behavioral matrix as a tool for the analysis of enterprises in rural areas. The time management matrix, popularized by Covey (1989), divides time into four quadrants: quadrant 1-urgent and important; quadrant 2-important but not urgent; quadrant 3-urgent but not important; quadrant 4-neither urgent nor important. Jung (2005) designed a matrix divided into four quadrants focusing on information and communication technology (ICT). Taylor et al. (2004) analyzed why so few non-credentialed teachers remained in teaching in the Los Angeles Unified School District (half of the new teachers leave after their first year). They proposed a matrix of teaching practice classification based on works by notably Coloroso (1994) and Edwards (2000).

Methodology

The study extends the concept of management matrix to construct a teaching improvement matrix model. This proposed matrix divides classes into quadrants according to their performance indicators' room for improvement. Applicable steps are developed to test model's feasibility and utility in order to formulate concrete suggestions for both administrators and educators.

Teaching improvement matrix model

The average values of teaching performance and teaching efficiency can segment the matrix into four quadrants, named I, II, III, and IV.

- Teaching performance: average value of classes' performance indicators selected from students' ratings to teachers at the end of each semester (in y-axis).
- The teaching efficiency: relative efficiency value calculated by applying DEA model and by using the above-mentioned selected performance indicators as input and output indicators (in x-axis).

Classes are located in quadrant I if their teaching performance and their teaching efficiency are both superior to the average values; on the contrary, the classes having both values inferior to the average are in quadrant III. Classes are in quadrant II if their teaching performance is superior to the average value and their teaching efficiency is inferior to the average value. Classes with a teaching performance inferior and a teaching efficiency superior to the average value are in quadrant IV.

Analysis of classes' improvement direction

Once classes have been located in different quadrants, the improvement direction for each class is explored. We take into consideration indicators' contribution in calculating the relative efficiency and their room for improvement in order to identify the importance of each performance indicator and to suggest the improvement direction. Classes' relative efficiency can be increased by

minimizing inputs' value or by maximizing outputs' value. An output orientation evaluates the maximum output performance needed under the current input resources, while an input orientation evaluates the minimum input effort needed to maintain the current output performance. However, Montoneri et al. (2011) indicate that minimizing input effort in order to obtain an efficiency value equal to one can mislead educators, because input orientation means to obtain a higher relative efficiency by reducing teaching efforts. This will probably discourage hard-working teachers from making tremendous efforts to improve their teaching skills. Therefore, we choose an output oriented analysis and we only discuss how to increase the performance of output indicators. Accordingly, classes' relative teaching efficiency can be enhanced by additional improvement effort in output indicators. We define for each class the additional effort needed for any output indicator, O_i, as the ratio of the importance of O_i's improvement needed in calculating relative efficiency to the importance of all the outputs' improvement needed. It is expressed as follows (1):

$$\text{DMU's additional effort needed for } O_i\ (\%) = \frac{O_i\text{'s contribution in efficiency} \times O_i\text{'s room for improvement} \times 100}{\sum_{J=1}^{\text{number of outputs}} O_j\text{'s contribution in efficiency} \times O_j\text{'s room for improvement}}$$

In equation (1), O_i represents selected output indicators; i varies from one to the number of outputs. If indicator O_i's contribution is 100%, it means that the relative efficiency value of this class is totally owing to this indicator. For example, an empirical study chooses only two outputs, such as Ouput1 and Ouput2, to evaluate classes' relative efficiency. Assuming the outputs' contribution in calculating efficiency value are 0% and 100%, and the outputs' rooms for improvement are 3.4% and 1.0%, respectively.

Then, the additional improvement effort needed in

$$\text{Ouput1} = \frac{0 \times 3.4 \times 100}{0 \times 3.4 + 100 \times 1.0} = 0\% \text{ and in Ouput2} = \frac{100 \times 1.0 \times 100}{0 \times 3.4 + 100 \times 1.0} = 100\%.$$

It means that this class only needs to improve the indicator Ouput2 and can neglect Ouput1 in order to increase its efficiency value in the short term. Similarly for all the classes, the equation

(1) suggests that they should concentrate or accentuate more improvement effort on the output indicator needing highest improvement effort value. According to this rule, we are able to segment all the classes into several categories, such as: "100% effort on Ouput1", "Effort on Ouput1> Effort on Ouput2", "Effort on Ouput2> Effort on Ouput1" and "100% effort on Ouput2". This segmentation aims at providing classes with concrete information about the additional effort in what direction they need to concentrate on in order to effectively improve their efficiency and performance.

Construction steps for formulating teaching improvement suggestions

This section presents the detailed steps to apply, from micro angle, the proposed matrix to construct improvement suggestions. This analysis concerns a specific study for an individual inefficient class. It can help teachers to know in what quadrant they and other classes are located and how much effort they should make to improve their efficiency and their performance. This phase consists of two stages: calculating the relative efficiency of each class and applying the proposed teaching improvement matrix. They are described as follows:

Stage one: Relative efficiency calculation

This stage gathers the results of relative efficiency calculated by DEA approach for a specific class in order to support the formulation of improvement suggestions.

Step 1. Calculating all the classes' relative teaching efficiency by applying DEA method in order to identity the inefficient and efficient ones.

Step 2. Finding out each inefficient class benchmark reference classes in order to define its role models.

Step 3. Listing each reference class contributions to the inputs'/outputs' optimal values in order to suggest a better choice of role models' output or input indicators.

Step 4. Ranking reference classes' contributions for each indicator in order to know their impact order, since the highest contribution does not always come from the same efficient class.

Step 5. Listing the rooms for improvement of each input/output indicator in order to provide suggestions to inefficient classes.

Step 6. Listing each input/output indicator's contribution in calculating classes relative efficiency in order to provide some clues in finding indicators' importance.

Stage two: Teaching improvement matrix application

This stage applies the proposed teaching improvement matrix in order to design applicable improvement suggestions.

Step 7. Calculating the average value of all the classes' relative teaching efficiencies and teaching performance (the average value of all the classes' indicators) in order to draw a teaching improvement matrix.

Step 8. Comparing each class relative teaching efficiency and indicators' average value with the average values obtained in Step 7 in order to locate them in the quadrants of the previously defined matrix.

Step 9. Engaging the analysis of indicators' improvement effort in order to identify the importance of each performance indicator and indirectly to indicate the improvement direction.

Step 10. Formulating improvement suggestions for the inefficient classes.

The data source

The study case is a private university established in 1956 in Taiwan. The data comes from the university's online student rating system, which provides student feedback to teachers at the end of each semester. The characteristics of the data source and research object are as follows:

1. 42 classes are selected during the academic years 2004 and 2005. They are the decision making units (classes), that is, the evaluated units, named from D1 to D42. There is an average of 35 students per class and 42 classes. Therefore, the data consists of around 1470 students. The sample is big enough to draw reliable conclusions.
2. Freshmen students in a university of Taiwan are chosen as a research object; Students are all freshmen, so they are 18-19 years old. Earlier data were used to protect undergraduate students' privacy.
3. Because of major modifications in the questionnaires in 2007, this paper uses data prior to this date for the sake of consistency.
4. The English course is a two-credit course (two hours/week).
5. Each teacher teaches only one class, that is, the 42 classes are taught by 42 different teachers.
6. The data are based on questionnaires (10 questions) filled out by the students at the end of each semester for each class. Each question is rated from one (very unsatisfied) to five (very satisfied).
7. All the students are required to fill out the questionnaires online if they want their grades to be validated. So it is assumed they all did it.

Selection of input and output indicators

Two inputs and two outputs are selected for the empirical study based on the focus of this study, that is, to find indicators having a significant impact on students' motivation and satisfaction in taking a course of English language. This paper aims at demonstrating the importance of teaching

clarity and teacher enthusiam and their impact on students' learning interest and perception of their scores. A correlation analysis is performed to test the reliability of the selected indicators. All the 10 questions in the questionnaires have been tested, however, only the four questions selected below are very positively correlated (with scores higher than 0.9; please see Table 1 below) and are reliable enough to draw scientific and useful conclusions (the highest correlations for the other indicators is 0.882, between Q7 and Q10; however, it seems odd to correlate teachers' attendance with students' perception about their scores).

The results of Pearson correlation coefficients between input and output indicators are summarized in Table 1. The inputs and outputs are all significantly positively correlated, reaching a statistically significant level of 1%, which is in line with the principle of equal expansion and means that the increase in inputs will result in the increase in outputs. The four indicators abbreviated by I1, I2 and O1, O2 respectively are presented as follows:

Input indicators:

I1. Teaching clarity (Q3: "Teachers explain clearly, make the content is easy to assimilate"): it refers to the degree of assimilation by the students in relation with teachers' professional knowledge and preparation of teaching materials.

I2. Teaching enthusiasm (Q6: "Teachers show enthusiasm for the course taught"): it indicates whether teachers can actively answer students' queries and clear their doubts. It signifies whether teachers can positively respond to students' questions and the maturity of teachers' teaching skills and communication skills.

Output indicators:

O1. Students' learning interest (Q5: "Teachers can increase your interest in this course"): students' interest and motivation are generally proportional to their learning performance.

O2. Students' satisfaction about grades (Q10: "Teachers give a very fair assessment of student achievement"): It does not mean that students are happy to have good grades or upset to have bad grades, but that they consider they have been graded fairly and objectively.

Table 1. Pearson correlation coefficients between input and output indicators. [a]

Outputs \ Inputs	I1 (Teaching clarity)	I2 (Teaching enthusiasm)
O1 (Students' learning interest)	0.965***	0.905***
O2 (Students' satisfaction about grades)	0.934***	0.953***

*** Significant levels at 1% and *p* value<0.001. [a] The number of observations is 42.

Empirical study

The empirical study illustrates the feasibility of the proposed teaching improvement matrix model. We first calculate the 42 classes' overall relative efficiency.

Overall relative efficiency

Stage one: Relative efficiency calculation

The selected input and output indicators data is fed into the software Frontier Analyst to calculate relative teaching efficiency values and relevant efficiency factors of the selected classes. The results under CCR model of DEA are listed in Table 2:

The column "Teaching efficiency" ranks classes by descending order. Classes with an efficiency value equal to 1 are efficient and constitute "reference sets" of efficiency benchmark for inefficient classes (classes with efficiency value inferior to one). These efficient classes form efficiency frontier curves; the efficiency value of each class is calculated by the distance between their location and these efficiency frontier curves. Eight classes (C33, C13, C3, C22, C29, C27, C5, and C25) are efficient and represent about 19% of all the classes. They do not need any improvement in the input and output indicators. The average efficiency of all the classes is 0.978.

The column “Reference DMUs” includes only efficient classes. The classes with relative teaching efficiency do not have to refer to other classes; but each inefficient class has its proper reference classes and can emulate their features and take them as role models. As a result, inefficient classes can approach to their efficiency frontier curves and by consequence enhance their relative teaching efficiency.

The column “Reference times” indicates the number of times an efficient class acts as a peer. By finding out the most popular reference class, it helps to identify a benchmark class and to formulate improvement suggestions for inefficient classes. Table 2 shows that C13 is the most popular reference class (24 times). Most of the inefficient classes refer to two or three efficient classes which constitute their efficient frontier curves and become their reference classes. C16 has only one reference class, C5. This means that C16’s efficiency frontier curve is only constituted by C5. Thus, all the efficiency factors concerning C16 are calculated based on C5’s values.

The column “Room for improvement” indicates the additional effort needed to become an efficient class. The calculation of the room for improvement of inefficient classes is based on their reference classes. An increase or decrease of the inputs or outputs may increase classes’ efficiency value. Under the output oriented model, an increase of outputs’ performance under current input resources can enhance the relative efficiency of classes until they become efficient. This explains why the values of inputs’ room for improvement are always zero or negative.

Table 2 shows that the room for improvement in outputs for all the inefficient classes’ varies from 0.3% to 9.2%. Inefficient classes have to pay different effort to O1 and O2 according to each output’s room for improvement. C28 and C37 need to improve O1 more than O2; however, C12, C16, and C20 need to improve O2 more than O1.

The column “Contribution in calculating CCR efficiency” can provide useful information concerning the importance of each input and output indicator in designing improvement

suggestions for inefficient classes. Averagely speaking, O1 is the most important factor in determining classes' relative teaching efficiency (63.3%); the next most important factor is I2 (59.0%). However, for the efficient classes, O1 is the most important factor (69.5%), followed by I1 (52.8%).

Table 2. Teaching efficiency and efficiency factors [a] of evaluated classes.

DMU name [b]	Teaching efficiency	Rank	Reference DMUs	Reference times	Quadrant in efficiency and performance matrix	Room for improvement (%)				Contribution in calculating CCR efficiency (%)			
						O1	O2	I1	I2	O1	O2	I1	I2

C33	1.000	1	C33	7	I	0.0	0.0	0.0	0.0	100.0	0.0	65.1	34.9
C13	1.000	1	C13	24	I	0.0	0.0	0.0	0.0	100.0	0.0	60.9	39.1
C3	1.000	1	C3	0	I	0.0	0.0	0.0	0.0	100.0	0.0	28.8	71.2
C22	1.000	1	C22	6	I	0.0	0.0	0.0	0.0	88.4	11.6	58.1	41.9
C29	1.000	1	C29	19	IV	0.0	0.0	0.0	0.0	67.8	32.2	42.8	57.2
C27	1.000	1	C27	1	IV	0.0	0.0	0.0	0.0	0.0	100.0	66.4	33.6
C5	1.000	1	C5	16	IV	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0
C25	1.000	1	C25	19	IV	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0
C8	0.997	9	C13, C25	0	I	0.3	0.3	-0.3	0.0	45.7	54.3	0.0	100.0
C42	0.995	10	C13, C25, C29	0	I	0.5	0.5	0.0	0.0	48.5	51.5	23.4	76.6
C14	0.995	11	C13, C25, C29	0	I	0.6	0.6	0.0	0.0	48.7	51.3	23.3	76.7
C28	0.991	12	C5, C25	0	IV	4.4	1.0	0.0	0.0	0.0	100.0	40.1	59.9
C15	0.990	13	C5, C22, C33	0	I	1.0	1.0	0.0	0.0	98.3	1.7	65.2	34.8
C34	0.990	14	C13, C25	0	IV	1.0	1.0	-0.1	0.0	45.2	54.8	0.0	100.0
C26	0.988	15	C5, C13, C29	0	I	1.2	1.2	0.0	0.0	68.5	31.5	43.4	56.6
C17	0.987	16	C13, C25, C29	0	I	1.3	1.3	0.0	0.0	48.6	51.4	23.3	76.7
C11	0.987	17	C5, C13, C29	0	I	1.4	1.4	0.0	0.0	68.8	31.2	43.8	56.2
C10	0.985	18	C5, C22, C33	0	I	1.5	1.5	0.0	0.0	98.3	1.7	64.5	35.5
C35	0.983	19	C13, C25	0	IV	1.7	1.7	0.0	0.0	45.9	54.1	0.0	100.0
C31	0.981	20	C13, C25, C29	0	I	2.0	2.0	0.0	0.0	47.9	52.1	23.1	76.9
C19	0.980	21	C13, C25, C29	0	I	2.0	2.0	0.0	0.0	49.1	50.9	23.5	76.5
C36	0.979	22	C13, C25, C29	0	I	2.1	2.1	0.0	0.0	48.5	51.5	23.2	76.8
C41	0.978	23	C5, C33	0	III	2.2	2.2	0.0	0.0	100.0	0.0	67.0	33.0
C18	0.977	24	C5, C13, C29	0	III	2.3	2.3	0.0	0.0	68.5	31.5	43.2	56.8
C37	0.977	25	C5, C27	0	III	4.9	2.4	0.0	0.0	0.0	100.0	66.6	33.4
C21	0.977	26	C13, C25, C29	0	II	2.4	2.4	0.0	0.0	48.4	51.6	23.1	76.9
C4	0.975	27	C5, C22, C33	0	II	2.5	2.5	0.0	0.0	98.3	1.7	64.7	35.3
C39	0.975	28	C13, C25, C29	0	II	2.5	2.5	0.0	0.0	48.7	51.3	23.2	76.8
C12	0.974	29	C5, C33	0	II	2.6	4.8	0.0	0.0	100.0	0.0	66.4	33.6
C7	0.966	30	C13, C25, C29	0	III	3.6	3.6	0.0	0.0	48.1	51.9	22.7	77.3
C23	0.965	31	C13, C25, C29	0	II	3.7	3.7	0.0	0.0	48.2	51.8	22.9	77.1
C24	0.963	32	C13, C25, C29	0	III	3.9	3.9	0.0	0.0	47.3	52.7	22.9	77.1
C40	0.962	33	C13, C25, C29	0	II	3.9	3.9	0.0	0.0	46.9	53.1	23.2	76.8

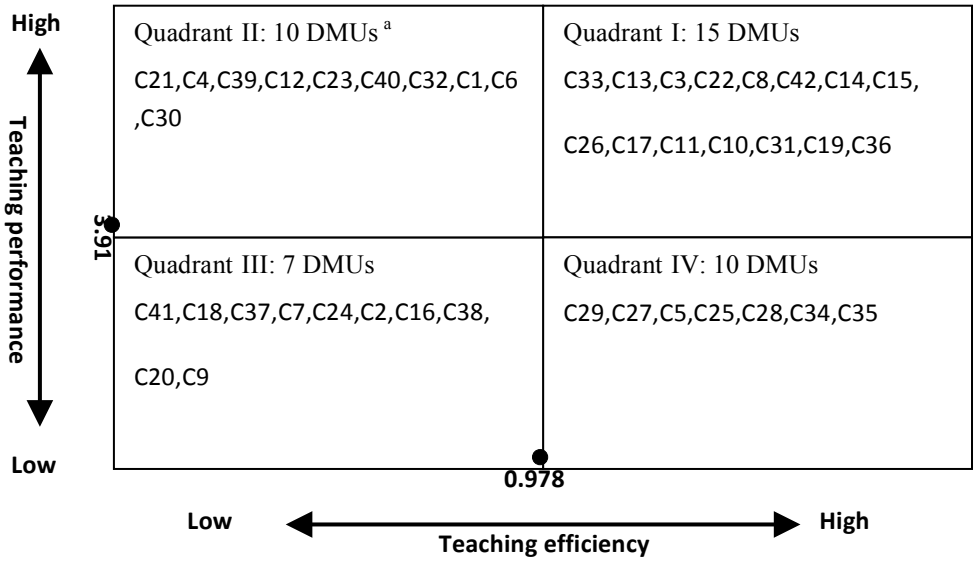
Average of all the DMUs	0.978					2.4	2.4	0.0	-0.1	63.3	36.7	41.0	59.0
Average of the efficient DMUs	1.000					0.0	0.0	0.0	0.0	69.5	30.5	52.8	47.2
Average of the inefficient DMUs	0.973					3.0	3.0	0.0	-0.1	61.9	38.1	38.3	61.7

Notes. [a] I1 indicates teacher's teaching clarity; I2 indicates teacher's teaching enthusiasm; O1 indicates students' learning interest; O2 indicates students' satisfaction about grades.

[b] DMU denotes the evaluated class. The number of observations is 42.

Stage two: Teaching improvement matrix application

The average values of teaching efficiency and teaching performance of all the classes are 0.978 and 3.91; they segment the matrix into four quadrants and divide all the classes into different locations in the matrix, as shown in Figure 1. There are 15 (representing 35.7%), 10 (23.8%), 10 (23.8%), and 7 (16.7%) classes in quadrant I, II, III, and IV, respectively.



Note. [a] DMUs located in each quadrant are in descending order of relative teaching efficiency.

Figure 1. Distribution of classes in the teaching improvement matrix.

In order to figure out the improvement direction for classes in different quadrants, we take into consideration input and output indicators' contribution in calculating the relative efficiency and their room for improvement to identify the importance of each indicator. Since this study uses an output oriented model to engage the analysis, the inefficient classes' relative teaching efficiency can be increased by making an additional effort in output indicators, as defined in the equation (1). The results are listed in Table 3.

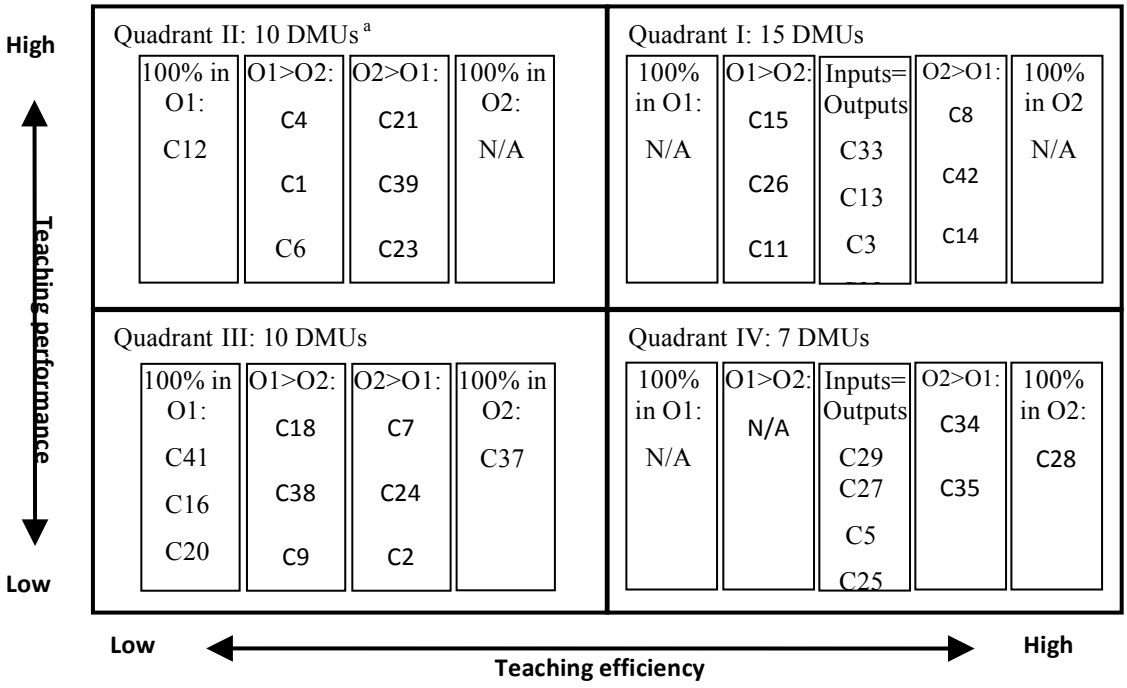
We observe that there are 11, 10, 10 and 3 inefficient classes located in quadrants I, II, III and IV, and they are identified in red, blue, green and violet colors, respectively in Figures 1-2 and in Tables 2-3. Two classes, C28 (in IV) and C37 (in III), are suggested to improve indicator's performance only in O2 (students' satisfaction about grades); four classes (C12 in II and C41, C16, C20 in III) are suggested to improve indicator's performance only in O1 (students' learning interest). Most of other inefficient classes (18 classes) are suggested to improve O2 more than O1. Moreover, for the more efficient classes (those located in quadrants I or IV), none is suggested to improve only O1; for the classes with better performance (those located in quadrants I or IV), none is suggested to improve only O2.

Table 3. Additional effort needed to increase teaching efficiency.

Inefficient classes' name	Located [a] quadrant	additional effort needed in [b] O1 (%)	O2 (%)	Inefficient classes' name	Located [a] quadrant	additional effort needed in [b] O1 (%)	O2 (%)
C8	I	45.7	54.3	C41	III	100.0	0.0
C42	I	48.5	51.5	C18	III	68.5	31.5
C14	I	48.7	51.3	C37	III	0.0	100.0
C28	IV	0.0	100.0	C21	II	48.4	51.6
C15	I	98.3	1.7	C4	II	98.3	1.7
C34	IV	45.2	54.8	C39	II	48.7	51.3
C26	I	68.5	31.5	C12	II	100.0	0.0
C17	I	48.6	51.4	C7	III	48.1	51.9
C11	I	68.8	31.2	C23	II	48.2	51.8
C10	I	98.3	1.7	C24	III	47.3	52.7
C35	IV	45.9	54.1	C40	II	46.9	53.1
C31	I	47.9	52.1	C2	III	48.3	51.7
C19	I	49.1	50.9	C16	III	100.0	0.0
C36	I	48.5	51.5	C32	II	47.7	52.3
				C38	III	88.3	11.7
				C1	II	98.3	1.7
				C20	III	100.0	0.0
				C9	III	68.3	31.7
				C6	II	88.0	12.0
				C30	II	47.7	52.3
Average of	I & IV	54.4%	45.6%	Average of	II & III	67.1%	33.0%
Average of I, II, III, IV: 61.9% in O1, 38.1% in O2							

Notes. [a] The located quadrant indicates the area where the classes are located in the teaching improvement matrix.

[b] O1 indicates students' learning interest; O2 indicates students' satisfaction about grades.



Note. [a] N/A means that there is no DMU located in this area. O1 indicates students' learning interest; O2 indicates students' satisfaction about grades.

Figure 2. Indicator's improvement priority in four quadrants.

Individual analysis: case of C30

C30 is ranked last in relative teaching efficiency according to DEA model. However, C30 has teaching performance score higher than the average value of all the classes and is located in quadrant II of the matrix. Therefore, C30 is a good example to demonstrate how to formulate improvement suggestions for the classes having good teaching performance but low relative teaching efficiency. The analysis procedure is divided into two stages:

Stage one: Relative efficiency calculation

Step 1. The results of relative teaching efficiency analysis show that only eight classes are efficient (C33, C13, C3, C22, C29, C27, C5 and C25).

Step 2. C30's relative efficiency value is 0.916. C30's reference classes are C13, C25 and C29.

Step 3. C13, C25 and C29's contributions to C30's inputs'/outputs' benchmark values are listed in Table 4.

Step 4. C13, C25 and C29's contributions ranking for each input/output indicator are listed in Table 4 below.

Step 5. The rooms for improvement for C30's input/output indicators are listed in Table 4.

Step 6. C30's input/output indicators' contributions in calculating C30's relative efficiency are listed in Table 4.

Table 4. Efficiency improvement analysis for the inefficient DMU C30.

		Outputs [a]		Inputs	
		O1	**O2**	**I1**	**I2**
Stage 1: Relative efficiency calculation					
Reference set's contributions to indicators' benchmark values (%)	C13	28.9(3) [b]	27.0(3)	28.6(3)	27.7(3)
	C25	33.9(2)	35.4(2)	35.2(2)	34.5(2)
	C29	37.2(1)	37.6(1)	36.2(1)	37.8(1)
Room for improvement (%)		9.17	9.17	0	0
Outputs/Inputs contribution (%) in calculating relative efficiency		47.7	52.3	23.0	77.0
Stage 2: Teaching improvement matrix application					
Analysis of indicators' improvement effort (%)		47.7	52.3	-	-

Notes. [a] I1 indicates teacher's teaching clarity; I2 indicates teacher's teaching enthusiasm; O1 indicates students' learning interest; O2 indicates students' satisfaction about grades.

[b] Numbers in the parentheses indicate the contributions ranking for each input/output indicator.

Stage two: Teaching improvement matrix application

Step 7. The average value of all the classes' relative teaching efficiencies and teaching performance are 0.978 and 3.91. The teaching improvement matrix is drawn.

Step 8. C30's relative teaching efficiency (0.916) is inferior to the average value of all the classes (0.978) and teaching performance (4.04) is superior to the average value of all the classes (3.91). Therefore, C30 is located in quadrant II of the matrix.

Step 9. The analysis of indicators' improvement effort shows that C30 needs an additional effort of 47.7% in O1 and 52.3% in O2.

Step 10. Teaching improvement suggestions for C30:

1. C30's two output indicators should be improved equally to 9.17%.

2. C30's two inputs, I1 and I2, can be maintained at the same level. It means that the teacher of C30 does not need to improve teaching clarity and teaching enthusiasm in order to improve his/her global evaluation.

3. All the input and output indicators have contribution in calculating C30's relative efficiency. O1 represents 47.7% and O2 represents 52.3% for the output indicators; I1 represents 23.0% and I2 represents 77.0% for the input indicators. Accordingly, the priority of indicators for C30 is I2>O2>O1>I1. (I1: teaching clarity; I2: teaching enthusiasm; O1: students' learning interest; O2: students' satisfaction about grades.)

4. Taking into account both the room for improvement in inputs and outputs and their contribution in calculating efficiency, the indicators with values not equals to zero at the same time should be improved in a priority in order to increase the class relative efficiency. Concretely speaking, it means that C30 needs to make efforts only on students' learning interest (O1) and students' satisfaction about grades (O2), and concentrate on improving more O2 than O1. It means that the teacher of C30 should, according to students, give the impression that the way the educator grades them is fair and objective. It implies giving feedback to students just after they receive their score (individually, not in public, as most students will feel unconfortable about it, making things even worse). In our experience, students appreciate when teachers give them a feedback and an explanation after the exam, even if they fail, or problably we should say, especially if they have a low score.

5. If C30 hopes to increase its relative efficiency in the short term, it should mainly refer to C29's students' satisfaction about grades (O2) up to 37.6%, to C25's O2 to 35.4% and to C13's O2 to 27.0%; then refer to C29's students' learning interest (O1) up to 37.2%, to C25's O1 to 33.9% and to C13's O1 to 28.9%.

6. If C30 hopes to increase its overall performance in each input and output indicators in the long term, its performance improvement measures can not merely refer to one single efficient class, even though C29 is the major model for C30. C30 is suggested to mainly refer to all of C29's input and output indicators around 37%, then refer to all of C25's indicators around 35%, and refer to all of C13's indicators around 28%. Concretely, one way to improve teaching is to ask other teachers who obtain higher evaluation for advice. It is also recommended to attend classes taught by some colleagues (if they agree) to benefit from their experience. It is also advised to ask students why they appreciate one teacher's class. In our experience for example, some teachers are severe, grade students relatively low and still receive a high score because students feel they were fairly graded. As a result, they don't blame their teacher for the results.

7. C30, currently located in quadrant II of the matrix, might make progress in teaching efficiency and upgrade to quadrant I, through the above-mentioned suggestions.

Conclusion

Contribution

The present paper addresses the issue of improving classroom teaching by using online students' ratings of teachers at the end of each semester for the academic year 2004 and 2005. The three main contributions of this study are:

1. Combining the concept of management matrix and a quantitative evaluation method to build a teaching improvement matrix based on teaching efficiency and teaching performance;
2. Developing teaching improvement procedures in order to formulate concrete suggestions to improve teaching;
3. Conducting an empirical study to demonstrate the proposed model's feasibility and utility.

These contributions may help educational administrators to have an overview of classes' efficiency and to obtain information concerning the number and the proportion of classes from the viewpoint of performance and efficiency. Applying this matrix every year may allow administrators to assess the progression or regression of classes' efficiency and performance trend for each academic year.

Main findings

An empirical study is conducted and provides an overall analysis of all the evaluated classes and an individual analysis in order to construct a teaching improvement matrix. This matrix is drawn according to the classification of classes under the CCR model of DEA. Classes are distributed in the four quadrants depending on their performance and efficiency. Once classes have been located in different quadrants, we take into consideration indicators' contribution in calculating the relative efficiency and their room for improvement in order to identify the importance of each performance indicator and indirectly to indicate the improvement direction in different quadrants for all the efficient and inefficient classes. The results of the overall analysis show that the

average values of teaching efficiency and teaching performance of all the classes are 0.978 and 3.91, respectively; they segment the matrix into four quadrants and divide all the classes into different quadrants in the matrix. There are 15, 10, 10, and 7 classes in quadrant I, II, III, and IV, respectively. The results of the individual analysis are based on the case C30; because this class is located in quadrant II, it demonstrates how to formulate improvement suggestions for the classes having good teaching performance but low relative teaching efficiency. C30's relative efficiency value is 0.916; it needs to make efforts only on O1 (students' learning interest) and O2 (students' satisfaction about grades), and concentrate on improving more O2 than O1. Then, we formulate improvement directions and suggestions in the short term and in the long term.

Future directions

In the current system in Taiwan, SET typically occurs at the end of the semester and teachers receive the results during the vacation or at the beginning of the following semester. As a result, no matter whether educators are willing to improve their classroom teaching, they can only apply changes to the students of the next year. Teachers and students often find little use for the evaluation process because there are no real time improvement suggestions during the semester. Since students have become courted customers, universities lacking of financial support and depending on student tuition fees for survival should pay more attention to students' opinions and satisfy their demands.

References

Abbott, M., & Doucouliagos, C. (2003), The efficiency of Australian universities: A data envelopment analysis. *Economics of Education Review, 22*(1), 89–97.

Achtemeier, S., Morris, L., & Finnegan, C. (2003), Considerations for developing evaluations on online courses. *Journal of Asynchronous Learning Networks, 7*(1), 1-13.

Arthur, L. (2009), From performativity to professionalism: lecturer's responses to student feedback. *Teaching in Higher Education*, *14*, 441-454.

Al-Issa, A., & Sulieman, H. (2007), Student evaluations of teaching: perceptions and biasing factors. *Quality Assurance in Education, 15*(3), 302-317.

Bothell, T. W., & Henderson, T. (2003), Do online ratings of instruction make Sense? In D. L. Sorenson & T. D. Johnson (Eds.), Online student ratings of instruction [Special issue]. *New Directions for Teaching and Learning,* 96, 69-80. Hoboken, NJ: Jossey-Bass.

Carle, A. C. (2009), Evaluating college students' evaluations of a professor's teaching effectiveness across time and instruction mode (online vs. face-to-face) using a multilevel growth modeling approach. *Computers & Education*, *53*(2), 429–435.

Cashin, W. (1999), Student Rating of Teaching: Uses and Misuses. In P. Seldin, *Changing Practices in Evaluating Teaching: A Practical Guide to Faculty Performance and Promotion/Tenure Decisions* (pp. 25-44). Boston: Anker Publishing Company, Inc.

Charnes, A., Cooper, W. W., & Rhodes, E. (1978), Measuring the Inefficiency of Decision Making Units. *European Journal of Operational Research, 2*(6), 429–444.

Colbert, A., Levary, R., & Shaner, M. (2000), Determining the Relative Efficiency of MBA Programs using DEA. *European Journal of Operational Research, 125*(3), 656–660.

Coloroso, B. (1994), *Kids Are Worth It: Giving Your Child the Gift of Inner Discipline*. New York: William Morrow.

Covey, S. R. (1989), *The Seven Habits of Highly Effective People*. New York: Free Press.

Davis, S. M., & Lawrence, P. R. (1977), *Matrix*. Reading, MA: Addison-Wesley Publishing Co.

Edström, K. (2008), Doing course evaluation as if learning matters most. *Higher Education Research & Development*, *27*, 95-106.

Edwards, C. (2000), *Effective Classroom Management*. New York: Allyn Bacon.

Farrell, M. J. (1957), The measurement of productive efficiency. *Journal of the Royal Statistical Society Series A. General, 120*(3), 253-282.

Ferrier, G. D., & Lovell, C. A. K. (1990), Measuring cost eficiency in banking: Econometric and Linear Programming Evidence. *Journal of Econometrics, 46*(2), 229-245.

Førsund, F. R., & Sarafoglou, N. (2002), On the Origins of Data Envelopment Analysis. *Journal of Productivity Analysis, 17*(1-2), 23–40.

Harrington, C. F., & Reasons, S. G. (2005), Online student evaluation of teaching for distance education: A perfect match? *The Journal of Educators Online, 2*(1), 1-12.

Hmieleski, K., & Champagne, M. V. (2000), Plugging into course evaluation. The Technology Source. Retrieved February 04, 2014, from http://technologysource.org/article/plugging_in_to_course_evaluation

Huston, T. (2005), Research report: Race and gender bias in student evaluations of teaching. Retrieved February 04, 2014, from Seattle University, Center for Excellence in Teaching and Learning Web site: http://www.seattleu.edu/cetl/cetl_006.htm

Johnes, J. (2006), Measuring teaching efficiency in higher education: an application of data envelopment analysis to economics graduates for UK universities. *European Journal of Operational Research*, *174*(1), 443-456.

Jung, I. (2005), ICT-Pedagogy Integration in Teacher Training: Application Cases Worldwide. *Educational Technology and Society, 8*(2), 94–101.

Kim, C, Damewood, E., & Hodge, N. (2000), Professor Attitude: Its Effect on Teaching Evaluations. *Journal of Management Education, 24*(4), 458-473

Lee, C. C. (2009), Analysis of overall technical efficiency, pure technical efficiency and scale efficiency in the medium-sized audit firms. *Expert Systems with Applications*, *36*(8), 11156-11171.

Leshem, S., & Bar-Hama, R. (2008), Evaluating teaching practice. *ELT Journal, 62*(3), 257-265.

Lin, T. T., Lee, C. C., & Chiu, T. F. (2009). Application of DEA in analyzing a bank's operating performance. *Expert Systems with Applications*, *36*(5), 8883-8891.

McGowan, W. R., & Graham, C. R. (2009), Factors contributing to improved teaching performance. *Innovative Higher Education, 34*(3), 161-171.

Martin, E. (2006), Efficiency and Quality in the Current Higher Education Context in Europe: an application of the data envelopment analysis methodology to performance assessment of departments within the University of Zaragoza. *Quality in Higher Education, 12*(1), 57-79.

Marsh, H. W. (1987), Student's evaluations of university teaching: Research findings, methodological issues, and directions for further research. *International Journal of Educational Research, 11*(3), 253-388.

Marsh, H. W. , & Roche, L. A. (1987), Making Students' Evaluations of Teaching Effectiveness Effective. The Critical Issues of Validity, Bias, and Utility. *American Psychologist, 52*(11), 1187-1197.

Marsh, H. W. (2007), Students' evaluations of university teaching: Dimensionality, reliability, validity, potential biases and usefulness. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education: An evidence-based perspective* (pp. 319–383). New York: Springer.

Montoneri, B., Lee, C. C., Lin, T. T., &. Huang, S. L. (2011), A Learning Performance Evaluation with Benchmarking Concept for English Writing Courses. *Expert Systems with Applications*, 38(12), 14542-14549.

Montoneri, B., Lin, T. T., Lee, C. C., & Huang, S. L. (2012), Application of data envelopment analysis on the indicators contributing to learning and teaching performance. *Teaching and Teacher Education*, 28(3), 382-395.

Ng, Y. C., & Li, S. K. (2000), Measuring the research performance of Chinese higher education institutions: an application of data envelopment analysis. *Education Economics, 8*(2), 139–56.

Penny, A. R. (2003), Changing the agenda for research into student's views about university teaching: four shortcomings of SRT research. *Teaching in Higher Education, 8*(3), 399-411.

Pred, A. (1967), Behavior and location: Foundations for a geographic and dynamic location theory. Part I. *Lund Studies in Geography*, Series B, 27.

Richards, J. C. (2010), Competence and performance in language teaching. *RELC Journal, 41*(2), 101–122.

Samoilenko, S., & Osei-Bryson, K. M. (2008), Increasing the discriminatory power of DEA in the presence of the sample heterogeneity with cluster analysis and decision trees. *Expert Systems with Applications, 34*(2), 1568-1581.

Selby, J. A. (1987), On the Operationalization of Pred's Behavioral Matrix. *Geografiska Annaler*. Series B, Human Geography, *69*(1), 81–90.

Sorenson, D. L., & Reiner, C. (2003), Charting the uncharted seas of online student ratings of instruction. In D.L. Sorenson & T.D. Johnson (Eds.), Online student ratings of instruction [Special issue]. *New Directions for Teaching and Learning, 96*, 1-24. Hoboken, NJ: Jossey-Bass.

Sorenson, D. L., & Johnson, T. D. (2004), Online student ratings of instruction [Special issue]. *New Directions for Teaching and Learning,* 96. Hoboken, NJ: Jossey-Bass.

Stronge, J. H. (1997), Improving schools through teacher evaluation. In J. H. Stronge, *Evaluating teaching: A guide to current thinking and best practice*, (pp. 1-23). Thousand Oaks, CA: Corwin Press.

Theall, M., & Franklin, J. (2000), Creating responsive student ratings systems to improve evaluation practice. In K. E. Ryan, Evaluating teaching in higher education: A vision for the future [Special issue]. *New Directions for Teaching and Learning, 83* (pp. 95-107). San Francisco: Jossey-Bass.

Taylor, C., Jones, A., Shindler, J., & Cadenas, H. (2004), "Architect and Steward: Shaping a Vision of Learning". Examining the Role of the Principal in the Immersion of New Teachers into Existing Urban School Climates. Charter College of Education, California State University, Los Angeles.

Wachtel, H. K. (1998), Student evaluation of college teaching effectiveness: a brief review. *Assessment and Evaluation in Higher Education, 23*(2), 191-210.

Wilson, V. (1997), Focus groups: a useful qualitative method for educational research? *British Educational Research Journal, 23*(2), 209-224.

Zabaleta, F. (2007), The use and misuse of student evaluation of teaching. *Teaching in Higher Education*, *12*, 55-76.

Appendix

Online questionnaire given to students, academic year 2004 and 2005. Original questions in Chinese with our personal translation. The questions were designed by the university and approved by the Ministry of Education in Taiwan.

1. 教師對課程有充分的準備

Teachers are well prepared for the course

2. 教師準備的教材內容適當

Teachers prepare appropriate teaching materials

3. 教師講解清楚易於吸收

Teachers explain clearly, make the content easy to assimilate

4. 教師對學生提出的問題有積極回應

Teachers respond positively to the issues raised by students

5.教師能提高您對本課程的學習興趣

Teachers can increase your interest in this course

6.教師對本課程具有授課熱誠

Teachers show enthusiasm for the course taught

7.教師不缺課，不無故遲到或早退

Teachers are not absent, late or leave early without a (good) reason

8.您從本課程收穫很多

You learned a lot from the course

9.教師有依照事先安排的綱要或進度授課

Teachers teach in accordance with pre-arranged lectures outline or progress

10.教師考核學生成績十分公平

Teachers give a very fair assessment of student achievement

To What Degree are Undergraduate Students Using their Personal Computers to Support their Daily Study Practices?

KwongNui Sim, Russell Butson

Abstract

This scoping study examines the degree to which twenty two undergraduate students used their personal computers to support their academic study. The students were selected based on their responses to a questionnaire aimed at gauging their degree of computer skill. Computer activity data was harvested from the personal computers of eighteen students and video footage of the students personal study sessions was gathered from a further four students. Three core themes emerged: (1) Academic Use vs. Non-academic Use; (2) Computer Orientated vs. Paper Orientated; and (3) Self-reports of Practice vs. Actual Practice. Overall results suggested three fundamental behaviors relating to technology use: 1] they were more likely to engage in non-academic work than academic work on their personal computer; 2] they were more inclined to use paper-based approaches compared to digital ones despite the high rate of personal computer ownership and internet access; 3] there was a disparity between students' self-reports of the degree to which they used their personal computers for academic purposes (high) and non-academic purposes (low) to what we found from computer logs which showed academic use as low and non-academic use as high. From these results we conclude that for this group of students computers played an important role in their day to day lives, but the degree to which they were used in their academic study was lower than we had expected.

Keywords: Student learning; E-learning; Higher education; E-literacy; Student study habits.

Introduction

As universities become more digital and computer technologies become increasingly sophisticated and ubiquitous, understanding the extent to which students integrate these technologies into their daily study practice is essential if we wish to understand their future potential to advance learning (Butson and Thomson, 2011). Nevertheless, there has been little research to date that explores students' first-hand experiences of using new technologies to support their academic practice (Sharpe et al., 2005). For example, the degree to which students today can be regarded as competent computer users in terms of utilising academic software in order to excel in their studies is hazy. While the literature shows an increasing number of undergraduate students own a computer and have a broadband connection (Aspden and Thorpe, 2009, Guidry and BrckaLorenz, 2010, Smith and Caruso, 2010, Dahlstrom, 2011), it is unclear to what extent these personal computers are utilised in the academic study practices of students. The typical assumption is that these 'digital natives' (Prensky, 2001) have a high level of computer literacy and are therefore likely to utilise their laptops to support their learning in advanced ways.

It is also worth noting that much of the research we found into student use of computer technologies has been based on surveys and interviews (perception data). By this we mean students reporting on what they believe they do through post-event recollection. The primary endeavor in regard to this investigation was to explore the use of datasets other than post-event recollections. This would require us to locate data collection as close as possible to the students' daily studying practices. Two approaches were explored and subsequently used: 1) computer usage data was extracted from the student laptops (Computer Activity Data) and 2) student's used video cameras to film their study sessions within their home study space (Cohort Behavioral Data). To ascertain if there was a difference between perception data and naturally occurring data a traditional self-report questionnaire was included.

Prior to the commencement of the study, three core areas of inquiry were established:

- The degree to which students utilised their personal computers for academic purposes as compared with non-academic use,
- The extent to which computer use had been adopted over traditional paper-based approaches,
- The degree to which student self-reports (post-event recollections) align with data capture of their actual practice.

Method

Given the exploratory nature of the study and the researchers social constructivist orientation, the study adopted the interpretive, naturalist enquiry approach of Guba and Lincoln (1989), and the analysis approach of Constructivist Grounded Theory of Kathy Charmaz (2006). This approach unpins the decision for the selection of a small number within a particular context to understand their experiences rather than a focus on generalisable findings. Two separate cohort groups were used from conveyance and not for any particular purpose, one capturing usage data from their computers (Computer Activity Data) and the other filming their home-based study practices (Cohort Behavioral Data) with considerably more input being required by this cohort. All participants were undergraduates and all completed the Self-report survey. ***The Self-report Data was gathered through a short questionnaire that ascertained the student perceptions of their degree of computer use. The top scoring students, those that self-reported as skilled computer uses, were invited to participate in the study.***

The Computer Activity Data: Eighteen students who self-reported as being skilled computer users were selected for this part of the study. A software programme (ManicTime) was installed on their personal computers. This software captured usage information on applications used, websites visited, documents accessed and the associated times and durations involved. The data was gathered over the duration of their first six studying weeks in semester one 2012. We were confident that this naturally-occurring activity data was going to yield rich information that was

going to be very different to the traditional perception data. It would allow us to review the applications used, documents accessed, websites visited and periods of use. However, the numerical nature of this data meant it couldn't tell us much about the context in which these digital activities were occurring. It was envisaged that the video capture that the students were generating of their home-based study practice would help situate the Computer Activity Data.

Cohort Behavioural Data: A second cohort consisted of four third year undergraduate students who also rated themselves as being skilled computer users. Each student was asked to capture a series of short video clips of their home study practices over a three month period. Over twelve hours of video footage resulted. Our interest was on the context(s): to what extent did the participants integrate and interact with computer technology in their daily undergraduate study habits.

These two datasets represented a mixture of students' actual computer practices (Computer Activity Data) and behaviours associated with study practice (Cohort Behavioural Data). While Computer Activity Data captured what students used their computers for, Cohort Behavioural Data was used to elicit data on how students used their computers within their study routines, and it gave us an insight into the context. Through these two datasets we hoped to gain some insight into what students used their computers for.

Findings

Guided by our three core areas of interest, an analysis of the three data sets (Self-reported skill level, Computer Activity Data, Cohort Behavioral Data) using the coding processes of grounded theory resulted in three themes:

- Academic Use versus Non-academic Use
- Computer Orientated versus Paper Orientated
- Self-Reports versus Actual Practice

Academic Use vs. Non-academic Use: From the Computer Activity Data (computer logs) we analyzed the top three software applications, documents used and web sites accessed. The most obvious classification was the academic or non-academic use. Academic refers to software, documents or web services that were related to the participants' academic study. Non-academic includes all other uses, such as banking, entertainment sites, Facebook groups, etc. As shown in table 1 the computer logs revealed much higher non-academic use compared with academic use.

Table 1:

Computer log data: breakdown between academic vs. non-academic use.

No. of Students	**Percentage (%)**	
	Academic	**Non-Academic**
15	10	90
2	20	80
1	90	10

For clarity values have been rounded to the nearest whole number

Paper Orientated vs. Computer Orientated: From the Cohort Behavioral Data, we analyzed the four participants' behaviors from their self-created 12 hours of filming. Coding the students activity while they were studying revealed a clear distinction between behaviors that were paper orientated and behaviors that were computer orientated. By paper orientated we are referring to repetitive behaviors that did not include the use of their computer. By computer orientated behavior we are referring to repetitive behaviors that did include the use of their computer. As shown in table 2 we found these students engaged in more paper-based activities during study sessions than computer-based.

Table 2:

Percentages for comparison of paper orientated vs. computer orientated activities

Participants	Percentage (%)	
	Paper Orientated	**Computer Orientated**
1	14	66
2	56	19
3	92	0
4	17	57

Note: The percentages do not distinguish between academic and non-academic activities and for clarity values have been rounded to the nearest whole number

Self-Reports of Practice vs. Actual Practice: We found a considerable difference between what students thought they used their computers for from what they actually used them for. While the self-report questionnaire indicated students believed they used their computers mainly for academic purposes the results from the computer logs suggested a very different story. As shown in Figure 1 the data shows students generally believed they used their computers more for academic purposes rather than non-academic (red). However, the computer logs revealed that 17 out of 18 of the students used their computers significantly more for non-academic purposes than for academic.

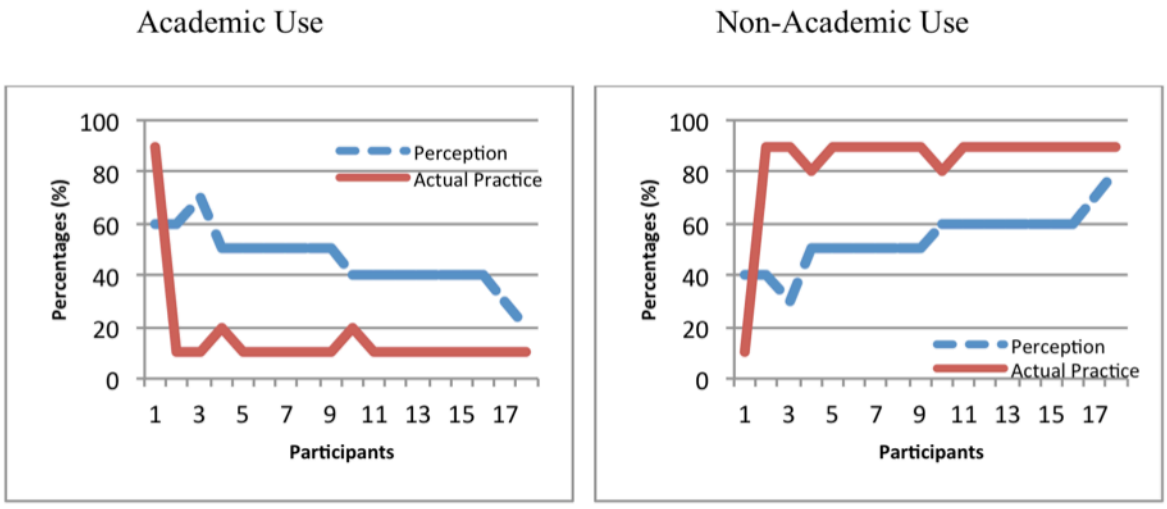


Figure 1: Actual and perceptual data of Academic and Non-Academic Use

This was reinforced from the Cohort Behavioral Data where students spent considerable time during their home-based study sessions on a variety of applications not associated with academic practice. As shown in *Figure 2* below, this student often played around with music software (as in the illustration on the left) and regularly checked her emails (as in the illustration on the right), while others had Facebook permanently on screen.

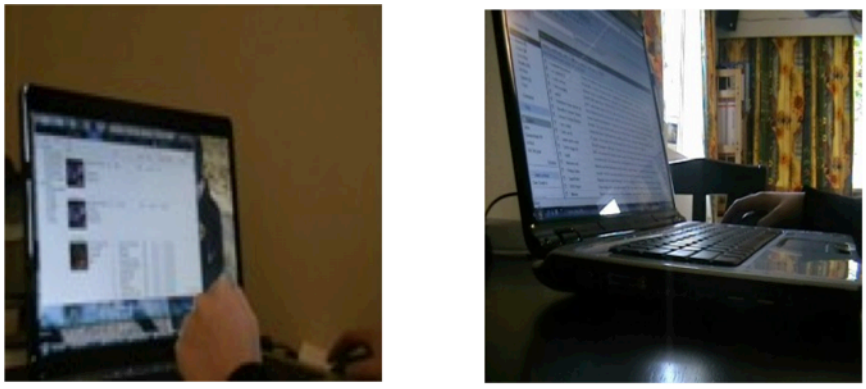


Figure 2: Non-academic work with technology[8]

The Cohort Behavioral Data also revealed that when these students did use their computers for academic purposes they exhibited a more limited degree of proficiency than we were expecting.

[8] Consent was granted by participants for the use of the film files for research purpose.

For example, we had footage of a student manually adding references for an assignment. The footage also captured her saying, “I’m just doing my psychology assignment … first of all I’m going to compile a list of references just using Microsoft Word …” She continued at this task for some time, repeatedly deleting large section when an error was made. She also commented about her expectations of the process before she started typing, “This is probably going to take me ages”. In the process, she said, “This is really time consuming”; “This is boring”; “God that is so annoying”; and “I’ve done this so many times I’ve just memorized reference lists”. The footage duration showed that she took more than one hour to add one page of references. When questioned later about her knowledge of software programs that automate much of this process, she replied she had heard of these but hadn’t used them.

Findings

As mentioned earlier, the core findings contributed to the development of three main themes, namely, Academic Use vs. Non-academic Use, Paper Orientated vs. Computer Orientated, and Self-Reports vs. Actual Practice.

All participants stated in the self-report questionnaire that computers played an important role in their undergraduate academic practice. This is not surprising given the rapid increase in the ownership of personal computers over the past five years by students enrolled in higher education (Aspden and Thorpe, 2009, Guidry and BrckaLorenz, 2010, Smith and Caruso, 2010, Dahlstrom, 2011). It seems reasonable then to assume that these students would be leveraging the benefits that computer technologies afford. However, our results did not support this. In fact we found the dominant use of their personal computers was for socialising (social networks such as Facebook and email), personal web services (auction sites and online banking) and entertainment (YouTube, music and movies). This was followed closely by web services such as retail, news, health, television, movies, information on pubs, air tickets, etc. Academic use on the other hand was

generally limited. This was a surprise given the growth of study resources such as PowerPoint slides, academic articles, and assignment guidelines being distributed in digital formats.

An analysis of the Cohort Behavioral Data (video footage) revealed that the participants exhibited only rudimentary awareness and skills concerning the capabilities of their computers to enhance their academic work (e.g., file management, bibliographies, planning, word-processing, databases, and analytical packages). In fact, the students in this study were completely unaware of the many academic-related software applications either on their computers or available through applications offered by the institution such as bibliography programmes (i.e., Endnote, Zotera, Mendley), planning programmes (e.g., Outlook, Evernote, OneNote), analysis packages (i.e., SPSS, NVivo, and MATLAB), and more generally (e.g., spread sheets, graphics software, programmes to support PDF annotation).

Given the wide-ranging conscience in the literature on student's computer savviness, we were taken aback by the degree to which these students were using paper-based approaches. It was clearly the preferred means of engagement regarding study. While the common format for course materials for these students was text based and digital (i.e., Microsoft Word, PowerPoint and portable document formats), all engaged in extensive indiscriminate printing of these materials. We were puzzled by this behaviour. We had assumed these students would exhibit high levels of digital orientated behaviour, instead we found they preferred to print material and apply traditional study techniques associated with paper-based form. We wondered if this was due to a lack of awareness of annotation and mark-up facilities, and the storage and retrieval capabilities that digital formats offer or did it signal something deeper about student's preference to use paper-based approaches.

It is interesting to speculate whether students' preference for paper-based approaches is the lack of skill/knowledge with the technology or whether it could be due to a dependence on paper-

based approaches inherent in higher education. It seems reasonable to assume that the way in which an institution embraces and implements technology is going to have a bearing on the way in which students will engage with technology in their higher education learning. Although students are comfortable with technology and see it as integral to higher education (Dahlstrom, 2011), they may expect that teaching staff will model the academic use of technology (Smith and Caruso, 2010).

Given the dominance of paper-based approaches it is not surprising that the ***Cohort Behavioural Data (video footage)*** showed that students were very reliant on their printers. In fact you could say that for academic use the computer was of little use without an attached printer. From the video footage it appeared that the computer was simply a device that was used to access documents that the student then printed and stored in ring binders. Incidentally, all used ring binders to store and categorise their printed resources.

Finally, it is worth noting that much of the literature we found on the role of computer technology in supporting learning in higher education was based on perception data. Part of this study was to explore the validity of this approach by examining whether there is a difference between students' perceptions and actual practice in relation to their computer use and their computer literacy. The results from Computer Activity Data suggest that there is considerable difference.

Studies employing perception data are typically optimistic regarding student dependency on personal computers for supporting study. A vast array of studies claim that computer technology now plays a significant role in supporting undergraduate education (Aspden and Thorpe, 2009, Dahlstrom, 2011, Guidry and BrckaLorenz, 2010, Smith and Caruso, 2010) and that this increased use is resulting in learning efficiencies for students (Smith et al., 2009). There is a degree of acceptance from much of this material that presupposes students "use technology in academia to give them access to resources and progress reports, make them more efficient as

students, facilitate connecting with others, and make learning more relevant and engaging" (Dahlstrom, 2011).

The naturally-occurring practice data captured in this study did not support these claims. Why were our findings different? When we looked only at the perception data (self-report questionnaire) gathered from our participants we found the conventional pattern appearing. The difference only occurs when we accessed the naturally occurring student activity. It gave us a way of 'seeing' what students did (and did not do) rather than what they said they did or did not do. As Starr and Fernandez (2007) noted, self-reported behaviours can be quite inaccurate for describing practice and thus we believe there are grounds to question the veracity of studies that use post-event capture to represent actual practice. Furthermore, participants' "perspectives in action" (records of behaviour) and/or "perspectives of action" (accounts of behaviour) (Belk and Kozinets, 2005, p. 132) should be taken into consideration when studying practice.

In summary

The aim of this study was to explore third year undergraduate students' practice of using their personal computers in their independent study sessions. While the findings from this study are specific to the cohort groups involved and are therefore not generalisable, the results do offer new understandings and insights into the use of computers to support undergraduate study. From this study, students were found to be active computer users and highly computer literate in non-academic use. Their academic use, in terms of practice and literacy, however, was low and limited. Students were also found to favour working in a paper-based manner rather than a digital one. Finally we found a clear difference in outcomes from perception data to naturally occurring data. We believe this finding brings into question the current dependence on perception data to reveal authentic, situated practice.

We are confident that this study will promote a deeper conversation about the role of technology in higher education and the use students currently make of personal computers/devices to support their study. Perhaps more research on larger and more diverse groups of students could be considered. Additionally, authentic and situated behavioural data should be employed in researching technology use. The difference found between perception and practice data signals the need for a substantial shift in the way we understand and gather data in this emerging field.

Acknowledgements

To Carla Thomson, University of Otago, for her contribution to the Cohort Behavioral Data.

The support and generosity of Dr Sarah Stein (Senior Lecturer at HEDC), without which the presentation at The European Conference on Technology in the Classroom (ECTC) in Brighton, UK on 11th-14th July 2013 could not have been undertaken.

References

Aspen, E. J., & Thorpe, L. (2009), *"Where do you learn?": Tweeting to inform learning space development.* [Online]. Educause Quarterly Educause. Retrieved February 04, 2014, from http://www.educause.edu/ero/article/where-do-you-learn-tweeting-inform-learning-space-development

Belk, R. W., & Kozinets, R. V. (2005), Videography in marketing and consumer research. *Qualitative Market Research,* 8**,** 128-141.

Butson, R., & Thomson, C. (2011), Reflections on the use of autovideography in an undergraduate education context. *Journal of Research Practice,* 7**,** 1-10.

Charmaz, K. (2006), *Constructing grounded theory: A practical guide through qualitative analysis,* Thousand Oaks, CA, Sage.

Dahlstrom, E. (2011), Connecting student data from ECAR and CDS. *Educause***,** 1-7.

Guba, E. G., & Lincoln, Y. S. (1989), *Fourth generation evaluation,* Newbury Park, Ca, Sage.

Guidry, K., & Brckalorenz, A. (2010), A comparison of student and faculty academic technology use across disciplines. Retrieved February 04, 2014, from http://www.educause.edu/ero/article/comparison-student-and-faculty-academic-technology-use-across-disciplines

Prensky, M. (2001), Digital Natives, Digital Immigrants. *On the Horizon,* 9**,** 1-6.

Sharpe, R., Benfield, G., Lessner, E., & Decicco, E. (2005), Final report: Scoping study for the pedagogy strand of the JISC learning programme.

Smith, S. D., & Caruso, J. B. (2010), The ECAR study of undergraduateutudents and information technology, 2010 *Educause.* October 2010 ed.

Smith, S. D., Salaway, G., & Caruso, J. B. (2009), The ECAR study of undergraduate students and information technology, 2009 *Educause* [Online], 6. Retrieved February 04, 2014, from http://net.educause.edu/ir/library/pdf/ers0906/rs/ERS0906w.pdf

Starr, R. G., & Fernandez, K. V. (2007), The Mindcam methodology: Perceiving through the native's eye. *Qualitative Market Research: An International Journal,* 10**,** 168-182.

Exploring Major Predictors of Student Satisfaction: An Input towards a Learning-Friendly School Environment.

Marilyn L. Balmeo, Allan B. Castro, Kristine Joy T. Caplis,
Kizzylenn N. Camba, Jahziel Gillian M. Cruz, Marion G. Orap,
and Joroma Sol T. Cabutotan

Abstract

The study sought to determine the perceived level of importance and perceived level of satisfaction of college students on 16 areas of student service commonly provided in a tertiary education setting within any university as prescribed and observed by local and international standards of tertiary education.

Each area was tested to determine the existence of a significant relationship between the measured response by respondents on their perceived level of importance and perceived level of satisfaction. The existence of a significant relationship between the two variables indicates that the given area of the learning environment is a major predictor towards student satisfaction. Item analysis was also performed on each area of the learning environment to determine specific indicators of student satisfaction.

The results of this research serves as a benchmark to any university [with similar status as the locale of the study] in identifying particular areas of the learning environment that are crucial in determining student satisfaction and must be focus of university maintenance and development so as to achieve a learner-friendly school environment.

The research was conducted with 399 students enrolled in Saint Louis University distributed in proportion to the population distribution of students in the different colleges within the said University.

Keywords: Student satisfaction; Perceived level of importance; Student services.

Introduction

The 21st Century Educational Goals suggest a reconstruction on the different educational principles which to a degree of urgency include citizenship preparation, inclusion, and the creation of an optimum learning environment (Laguardia and Pearl, 2009).

The degree of citizenship preparation given by a learning institution to its students can be measured by the performance of a student outside the school setting. While inclusion and the type of learning environment by educational institutions are measured in the attitude and services an educational institution affords for its students inside the school.

Inclusion is defined as the approach whereby students with disabilities receive all instruction in a general education classroom while support services, like specialists, are expected to come to the student (Hardman, Drew & Egan, 2006).

The Learning Environment, which serves as the subject of this research, pertains to any formal or non-formal setting where students gain knowledge and skills to be used in their learning (UNESCO). Such may take form of schools, colleges, cultural centers, hobby centers and social clubs. It also includes the buildings, infrastructures, machineries, the quality of service, and the efficiency of workforce inside an educational institution.

Assessing a learner-friendly school environment

The learning environment is typically composed of 4 elements: teacher-student relationship, atmosphere of inclusion, school facilities and services, and school departments and bureaucracies (Coll and Draves, 2009; Laguardia and Pearl, 2009; Stebleton, Huesman and Kuzhabekova, 2010; Roberts and Styron, 2009; Johnson, 1997; Umbach and Porter, 2002).

On the other hand, to qualify a learner-friendly school environment, there must be the existence of an effective interplay of the 4 elements of the learning environment (Gulosino and Lubienski,

2011). This means that, aside from the existence of the prescribed student services, student services must operate in high-efficiency.

In the Philippines, the normative practice by which the efficiency of the learning environment of colleges and universities is assessed through the quantity of national citations and accreditations an institution garner, and the civil service examination passing rates by programs within a certain educational institution (Corpus, 2003).

However, these traditional ways of assessing the learning environment are futile as they disregard the way the learning environment operates in normal circumstances. The use of accrediting agencies, civil service examinations and categorical citations allows for ample preparation by universities to give a good impression and attain high scores in such events. This kind of scenario is a common practice in Philippine Colleges and Universities.

Although efforts on measuring the efficiency of a learning environment are performed, such efforts are either focused on measuring the areas of instruction and school facilities. This means that full-scale assessment of the quality of the learning environment is commonly absent.

To address such problem, it is always advocated that students should also be able to have a say on the manner the learning environment operates on all areas to have an honest assessment of the quality of such. This is so since students have a full-knowledge on the learning environment given their direct interaction with such. One of the most common standards used by students in evaluating the learning environment is their satisfaction towards it.

Theoretical and conceptual framework of satisfaction

The theory adopted in this research to explain how major predictors of satisfaction are determined is the Stimulus-Organism-Response theory. The S-O-R Theory states that for any stimulus, an individual is expected to produce a certain response. The degree of the response is determined in accordance to the organism variables upheld by a person such as cognition, emotion, knowledge etc. (Algharabat, 2007).

In parallelism to the act of assessing the learning environment, the areas of service, and its specific indicators, is determined as the stimulus while the level of satisfaction to each area of service is seen as a [possible] response by students. The organism variable can be seen of a significant role when one tries to make a sense out of the satisfaction response by students to the areas of the learning environment.

In this research, the attempt of determining major predictors of student satisfaction used the organism/student variable of perceived level of importance for each area of the learning environment. In concept, the existence of a direct relationship between the perceived level of importance and level of satisfaction by students on the areas of the learning environment is indicative to such area as a major predictor to student satisfaction.

By knowing the areas of the learning environment that serves as major indicators to student satisfaction, the school will be able to know what areas of the learning environment can promote a learner-friendly environment.

Purpose Statement

This study aims to identify the major predictors affecting student satisfaction along the areas of the learning environment, particularly its locale that is Saint Louis University.

Knowledge on the specific indicators of learner-friendly environment allows for any university administration or management to determine which area of the learning environment needs crucial focus to sustain student satisfaction. It also lessens the non-strategic spending by schools by determining what areas really need improvement.

Over-all, this serves as a guide on how to create a learner-friendly environment by identifying specific areas of the learning environment that highly affects student satisfaction. Needless to say, satisfaction of the students translates to the friendliness of the school.

Problem Statement

Since the research aims in determining major predictors of student satisfaction by using the level of satisfaction and perceived level of importance on the student services by the students of a school environment, the essential questions of this research are identified as:

- What is the perceived level of importance of students along the sixteen identified areas of the learning environment?
- What is the level of students' level of satisfaction along the sixteen identified areas of the learning environment?
- Is there a significant relationship in the students' perceived level of importance and level of satisfaction along the sixteen identified areas of the learning environment?

Extension to these questions is the task of identifying specific indicators for each area of the learning environment that serve as a major predictor to student satisfaction.

Method

Locale of the study

This research, centering on knowing the variables that determine a leaner-friendly school environment involved the assessment of all the 9 colleges present at Saint Louis University as its study locale.

Respondents included the population of Saint Louis University in the 3rd, 4th and 5th year levels. Respondents were limited to such because of the assumption that students on these year levels have a full knowledge and a maximum interaction with all the areas of the learning environment given their years of stay in the university

Data gathering method

Population sampling was used to get the total number of respondents as the representative figure of the entire population. The calculated number of respondent totals to 399 students distributed in proportion to each college of the university.

The administration of questionnaires was held using random floating of questionnaires in cooperation with the respective deans of each college.

Data collection tool

A questionnaire was used to gather data. The questionnaire is a three-column survey questionnaire that required student respondents to rate their perceived level of importance and their level of satisfaction from a scale of 1 to 5.

There are 267 items contained in the questionnaire which were distributed among the 16 different services/facilities which were identified as Instruction (22 items), Admission (10 items), Guidance Office (13 items), Accounting Office (13 items), Dean's Office (20 items), Bookstore (14 items), Library (30 items), Food Services (15 items), Computer Laboratory (20 items),

Science Laboratory (26 items), Students Affairs Office (16 items), Campus Security (10 items), Janitorial Services (10 items), Audio-Visual Rooms (8 items) and Over-all Facilities (30 items).

The areas of the learning environment, and their corresponding items/specific indicators, were determined in accordance to the generally existing areas of the learning environment existing in most tertiary education institutions nationally and internationally.

Statistical tools

Statistical formulae that were used include the Weighted Mean (WM) and Regression Analysis (r).

In answering problem number 1 and problem number 2, the general weighted mean (WM) of items were used to which results were interpreted in the following manner: 1.00-1.74: Not Important (NI)/ Dissatisfied (D), 1.75-2.49: Slightly Important (SI)/Slightly Satisfied (SS), 2.50-3.24 : Important (I)/ Satisfied (S) and 3.25-4.00: Very Important (VI)/Highly Satisfied (HS).

In treating question number 3, Regression Analysis (r) was used to derive the possibility of an existing relationship between the items and the significance of the relationship was validated by using a P-value of .05.

After deriving the existence of relationship between areas, item analysis was conducted using Regression Analysis (r) to identify items that serve as major predictors of student satisfaction in line with student services.

Interviews

Also, since this research concerns students' perspective of the learning environment, perceptions by the respondents of this research were also incorporated in interpreting results.

Research limitations

The results, and even the suggestions, in this research may prove irrelevant to some schools that may uphold a different learning environment as compared to the research's locale.

This research only took into full account the areas of the learning environment present in the research's locale. Hence, the results of this research may be applicable to educational institutions with a similar profile as Saint Louis University.

What is the perceived level of importance of students along the different services of the school?

In the given table, it can be seen that all of the areas of the learning environment were considered as "very important" by respondents. Results suggest that all the given areas of the learning environment play an important role the development of college students.

This is furthered by a student interview stating that the presence of such areas of the learning environment allows for students to address their personal needs in the varying aspects of being a student—psychological needs, health needs, academic assistance support needs etc.

In a nutshell, the importance of such areas of learning environment only prove that holistic development of students can only be made possible by the existence of facilities, services, program supports etc. that are directly present to cater to such needs of students.

What is the level of satisfaction of students along the different services of the school?

From the table below, it can be seen that respondents expressed varying satisfaction rating for each area.

Results and discussions

Areas of the Learning Environment	Level of Importance		Level of Satisfaction		r
	OWM	DE	OWM	DE	
A) University Instruction	3.63	VI	2.72	S	.021
B) University Admission	3.50	VI	2.83	S	.074

C) Guidance Office	3.57	VI	2.71	S	.103*
D) Accounting Office	3.59	VI	2.60	S	.003
E) Dean's Office	3.62	VI	2.85	S	.074
F) Bookstore	3.53	VI	2.63	S	.047
G) Library	3.59	VI	2.65	S	.091
H) Canteen Services	3.62	VI	2.41	SS	.027
I) Computer Laboratory	3.58	VI	2.58	S	.122*
J) Science Laboratory	3.44	VI	2.61	S	.380*
K) Student Affairs Office	3.57	VI	2.59	S	.062
L) Campus Security	3.64	VI	2.69	S	.150*
M) Clinic	3.57	VI	2.70	S	.109*
N) Janitorial Services	3.59	VI	2.81	S	.101*
O) Audiovisual Services	3.63	VI	2.47	SS	.023
P) Overall Campus Facilities	3.58	VI	2.49	SS	.013
** r value is significant; P-value ≤.05*					

Table: A table presenting the score results and corresponding interpretation on the respondents perceived level of importance and level of satisfaction on the areas of the learning environment and the existence of significant relationship between the two.

It can be seen that there are three areas which garnered a "Slightly Satisfied" response. It includes the Canteen Services, Audiovisual Services and Overall Facilities of the University. Reasons given by respondents for their rating for each area includes a) canteens in the university don't consider the suggestions of students in coming up with the daily menu, b) there are shortages of units and rooms for audiovisual services and c) miscellaneous services like elevators, online enrollment and vending machines are not present within the university premises.

Also, students identified that areas that garnered a plain satisfied response are due commonly to a) the absence of such areas of learning environment on all or some of the campuses, b) the use of out-dated materials and c) some issues concerning the approachability of staffs for certain areas.

Clearly, all the areas of the learning environment require constant improvement, monitoring, and maintenance to ensure the increase of student satisfaction response to such. Is there a significant relationship in the respondent's perceived level of satisfaction and their level of importance for the areas of the learning environment?

The importance of knowing if a significant relationship exists between the level of satisfaction and perceived level of importance by students is to determine the major predictors of student satisfaction. By this, areas of the learning environment that highly contributes to student satisfaction can be identified, thus, allowing educational institutions to determine the areas that should be a) maintained to sustain a learner-friendly school environment and b) that should be improved to achieve a full learner-friendly school environment

In the given table, there are only 6 out of the 16 areas of the learning environment which were identified with an existing significant relationship between respondents' perceived level of importance and level of satisfaction. Hence, these areas are seen as major predictors to student satisfaction. These include the guidance office, the computer laboratory, the science laboratory, the campus security, the clinic services and the janitorial services.

In an item analysis, it was found out that in each area with existing significant relationship, specific indicators per area manage to qualify as specific predictors of student satisfaction.

Firstly, for the area of guidance services, the major predictors of satisfaction includes a) the presence of extension services like scholarships, exchange student programs and student organizational networking, b) the issuance of printed results of tests and c) the availability of staff during working hours.

Secondly, for the computer laboratory area, respondents identified a) the adherence of computer laboratory instructors to school policies regarding computer use and ethics in accessing information, b) the giving of manuals on rules and policies regarding computer use and reservation and c) the presence of monitoring and inspection on laboratory facilities were considered as the major indicators of satisfaction in the area of computer laboratory services.

Thirdly, for science laboratory services, a) the conduct of experiments that are only authorized by the school, b) the proper explanation of written laboratory directions to student before execution of any activity and c) the presence of enough water supplies and faucets in the laboratory were determined as the major indicators of student satisfaction.

Fourthly, for the area of campus security, indicators that serve as major predictors to student satisfaction include the assurance that security guards are a) equipped with protective skills, b) well-groomed and c) well-disciplined.

Fifthly, major indicators of student satisfaction on the area of clinic services include a) the sterilization and cleaning of clinical equipments, b) the availability of doctors in the clinic at anytime of the day and c) the approachability of staff.

Lastly, for the area of janitorial services, a) the friendliness, honesty and approachability of janitors, b) the presence of cleaning materials and tools inside the classroom and c) the presence of janitors in all areas of the school were identified as major indicators to student satisfaction.

In a close analysis, areas and specific indicators that serve as major predictors of student satisfaction includes those that are considered most crucial to promote student safety and classroom order (like that of the computer and science laboratories), to promote a pleasing school environment (like that of the security and janitorial services) and to cater to the student personal needs like health and wellness (like that of the guidance and clinic services).

The simple interpretation to such result is this: among the 16 areas of the learning environment presented, the most crucial areas that predict student satisfaction only include 6 areas of the learning environment. Such result means that 6 offices are only seen as predictors to a learner-friendly environment (of course, as per the indicators provided in the research questionnaire).

This implies that the core focus of any learning institution for development and maintenance of the learning environment should be directed towards the identified six areas of the learning environment. Such is so as to lessen the unstrategic use of resources in trying to improve all areas of the learning environment while achieving less in meeting student satisfaction.

In conclusion, to achieve maximum learner-friendly environment while using less resources, educational institutions must focus on developing the areas, and the specific indicators per area, of the learning environment that serves as major predictors of student satisfaction.

Result limitations

The result of the hypothesis on determining the major predictors of satisfaction was dependent on the values upheld by the respondents of the research. Therefore, areas of the learning environment which are deemed as major predictors of student satisfaction can vary from one school to another. Also, results cannot be automatically applied to any tertiary institution due to the difference on functions observed for each area of the learning environment. The research recognizes that each institution upholds additional/specialized roles and transaction orders for each area.

Suggestion and recommendations

What suggested programs should be implemented to further enhance the university's student services?

A) Creation of a manual on the areas of the learning environment

In any tertiary education institution, it would be student-friendly if the school issues a manual identifying the various areas of the learning environment and the specific services provided in

each area of the learning environment. Such manual would help students to be informed more on the existing programs and student support systems to intensify the awareness of students to such and to maximize the use of such areas of the learning environment by students.

B) Survey on major predictors of the learning environment

This includes the simple act of constructing a data collection tool that would measure the perceived level of importance and level of satisfaction of students on the learning environment they are situated. Following the same methods of this research, educational institutions will be able to pin point which areas of the learning environment are most important and are in need of a degree of maintenance and development by the institution's management.

What are some recommendations by researchers related to the research?

The researchers recommend for future researchers of the same topic to make a cross-sectional study along various institutions to determine whether there exists a significant difference in the areas of the learning environment that are seen as major predictors to student satisfaction.

Conclusion

From the research, it can be concluded that not all areas of the learning environment are considered as major predictors of the student satisfaction.

Although, this doesn't mean that no efforts or whatsoever should be afforded to improve those areas which are not considered as major predictors of student satisfaction.

Through identifying the major predictors of satisfaction, it allows university administration to determine specific areas that require much focus for maintenance and development.

References

Algharabat, R. (2007), The role of the stimulus-organism-response (s-o-r) model in explaining effects of image interactivity technology (IIT) on consumer responses. *Brunel University Journal, PhD Doctoral Symposium 2007*, Paper no. 28. Retrieved February 04, 2014 from http://www.brunel.ac.uk/__data/assets/file/0004/90535/phdSimp2007RaedAlgharabat.pdf

Coll, J. E., & Draves, P. (2008), Traditional age students: worldviews and satisfaction with advising a homogeneous study of student and advisors. *College Student Affairs Journal, 27(2), 215-223.*

Corpus, M. T. (2003), Philippine perspectives of the Philippine quality assurance system. *Journal of Philippine Higher Education Quality Assurance, 1(1)*, 1-7.

Gulosino, C., & Lubienski, C. (2011), School's strategic responses to competition in segregated urban areas: patterns in school locations in metropolitan detroit. *Educational Policy Analysis Archives 19(13)*.

Hardman, M. L., Drew, C. J., & Egan, M. W. (2006), *Human exceptionality school, community and family*. (8th ed.). USA: Pearson Publishing House.

Johnson, R. (1997), Equal access to quality school facilities. Intercultural Development Research Association. Retrieved February 04, 2014 from http://www.idra.org/IDRA_Newsletter/March_1997_Coordination_of_Funds_and_Programs/Equal_Access_to_Quality_School_Facilities/

Laguardia, A., & Pearl, A. (2009), Necessary educational reform for the 21st century: The future of public schools in our democracy. *Urban Review: Issues ad Ideas in Public Education, 41(4)*, 352-368. Doi: 10.1007/s11256-008-0115-9

Roberts, J., & Styron, R. Jr. (2009), Student satisfaction and persistence: factors to student retention. *Research in Higher Education Journal, 1-18.* Retrieved February 04, 2014 http://www.aabri.com/manuscripts/09321.pdf

Stebleton, M. J., Huesman, R. L. Jr., & Kuzhabekova, A. (2010), Do I belong here? Exploring immigrant college student responses on the SERU survey sense of belongingness/satisfaction factor. *CSHE Research and Occasional Paper Series 13.10. Berkeley, CA: University of California-Berkeley, Center for Studies in Higher Education.* Retrieved February 04, 2014, from http://www.oir.umn.edu/static/papers/NASPA_2010/2009_SERU_Symposium_immigrant_study_presentation.pdf

Umbach, P. D., & Porter, S. R. (2001), How do academic departments impact student satisfaction? Understanding the contextual effects of departments. *Research on Higher Education, 43(2)*, 209-231.

United Nations Educational, Scientific and Cultural Organization (2009), *Embracing diversity: Toolkit for creating inclusive, learning-friendly environment*. Bangkok, Thailand: Author. Retrieved February 04, 2014, from http://unesdoc.unesco.org/images/0018/001829/182975e.pdf

Additional biography

Archambault, L., Hartwell, L., Frisk, E. & Hale, A. (2012). *Developing Sustainability Literacy among Preservice Teachers Through Web-based Learning*. In Proceedings of Society for Information Technology & Teacher Education International Conference 2012 (pp. 83-87). Chesapeake, Virginia: AACE Publishing, Inc.

Barth, M. E., & Schipper, K. (2008), Financial reporting transparency. *Journal of Accounting, Auditing and Finance Spring, 23(2)*. Rochester, New York: SSRN.

Bocala, C., Morgan, M., Mundry, S., & Mello, D. (2010), Do states have certification requirements for preparing general education teachers to teach students with disabilities? Experience in the northeast and islands region. *Issues & answers*. Rel 2010-no. 090. Regional Educational Laboratory Northeast and Islands. Retrieved February 04, 2014 from http://www.eric.ed.gov/PDFS/ED526433.pdf

Brears, L., MacIntyre, B., & O'Sullivan, G. (2011), Preparing teachers for the 21st century using PLB as an integrating strategy in science and technology education. *Design and Technology Education, 16(1), 36-46.* Retrieved February 04, 2014 from http://www.eric.ed.gov/PDFS/EJ916495.pdf

Brooks, S. (2001), Integration of information resources and collection development strategy. *Journal of Academic Librarianship, 27(4), 316-319*. Doi: http://dx.doi.org/10.1016/S0099-1333(01)00218-X

Carver, C. S., & Scheier M. F. (2008), Feedback processes in the simultaneous regulation of action and affect. *Handbook of Motivation Science.* New York, USA: The Guilford Press.

Centra, J. A. (1973). Effectiveness of student feedback in modifying college instruction. *Journal of Educational Psychology, 65(3)*, 395-401. USA: American Psychological Association.

Cornacchia, H. J., Olsen, L. K., & Ozias, J. M. (2001), *Health in elementary schools*. (9th ed.). USA: Mosby-year Book Inc.

Coy, D. R., & Long, J. K. (2005), Maslow and miller: an exploration of gender and affiliation in the journey competence. *Journal of Counseling and Development, 83(2)*, 138.

Culp, M. M. (2005), Increasing the value of traditional support services. *New Directions for Community Colleges*, 131, 33-49.

deFur, S. H., & Korinek, L. (2008), The evolution toward lifelong learning as a critical transition outcome for the 21st century. *Exceptionality, 16(4)*, 178-191. Doi: 10.1080/09362830802412158

De Grez, L., Valcke, M., & Roozen, I. (2009), The impact of goal orientation, self-reflection and personal characteristics on the acquisition of oral presentation skills. *European Journal of Psychology of Education, 24(3)*, 293-306.

Deikman, A. B., & Eagly, A. H. (2008), Of men, women, and motivation a role congruity account. *Handbook of Motivation Science.* New York, USA: The Guilford Press

Department of Psychology, University of Michigan. *Howard Gardner's Multiple Intelligences.* Retrieved February 04, 2014 from http://sitemaker.umich.edu/356.martin/home

Drummond, K. E., & Brefere, L. M. (2007), *Nutrition for food service and culinary professionals.* (7th ed.). Canada: John Wiley & Sons Inc.

Espina, P.D. (2009), Physical aspects of campus security. *Security In and Out School.* Retrieved February 04, 2014 from http://securitymatters.com.ph/physical-aspects-of-campus-security-379/

Fiske, S. T. (2008), The core social motivations views from the couch, consciousness, classroom, computers, and collectives. *Handbook of Motivation Science.* New York, USA: The Guilford Press.

Gawel, Joseph E. (1997), Herzberg's theory of motivation and maslow's hierarchy of needs. *Practical Assessment, Research & Evaluation, 5(11).* Retrieved February 04, 2014 from http://pareonline.net/getvn.asp?v=5&n=11

Grant, H., & Dweck, C. S. (2008).,Self-theories, goals and meaning. *Handbook of Motivation Science.* New York, USA: The Guilford Press.

Hu, S. (2011), Scholarship awards, student engagement, and leadership capacity of high-achieving low-income students of color. *Journal of Higher Education, 82(5)*, 511-534.

Hurliman, S. K., & PAston, K. (2011), Code labs: expediting laboratory test results during a code. *Critical Care Nurse, 31(5)*, 6-30.

Hwang, Y. S., & David, E. (2011), Attitudes towards inclusion: gaps between belief and practice. *International Journal of Special Education, 26(1)*, 136-146. Retrieved February 04, 2014 from http://www.eric.ed.gov/PDFS/EJ921198.pdf

Jones, V. F. & Jones, L. S. (2001), *Comprehensive classroom management creating communities of support and solving problems*. USA: Allyn & Bacon.

Korkmaz, I. (2008), Elementary teachers' perceptions about implementation of inclusive education. *US-China Education Review, 8(2)*, 177-183.

Kose, B. W., & Lim, E. (2010), Transformative professional learning within schools: relationship to teacher's beliefs, expertise and teaching. *International Journal of Leadership in Education, 13(4)*, 393-419.

Leary, M. R., & Cox, C. B. (2008), Belongingness motivation a mainspring of social action. *Handbook of Motivation Science.* New York, USA: The Guilford Press.

Leather, D. J., & Marinho, R. D. (2009), Designing an academic building for 21st century learning: a dean's guide. *Change: The Magazine of Higher Learning, 41(3)*, 42-49.

Lo, C. C. (2010), How student satisfaction factors affect perceived learning. *Journal of the Scholarship of Teaching and Learning, 10(1)*, 47-54.

Lucas, M. R. D., & Corpuz, B. B. (2007), *Facilitating learning: a metacognitive process.* Quezon City: Lorimar Publishing Inc.

Mackey, T. P. (2010), *Collaborative information literacy assessments: strategies for evaluating teaching and learning*. London: Facet Publishing.

McClellan, J. A., & Conti, G. J. (2008), Identifying the multiple intelligences of your students. *Journal of Adult Education, 37(1)*, 13-32. Retrieved February 04, 2014 from http://www.eric.ed.gov/PDFS/EJ891071.pdf

Merrienboer, J. J. G., & Paas, F. (2003), Powerful learning and the many faces of instructional design: Toward a framework for the design of powerful learning environments. In E. De Corte, L. Verschaffel, N. Entwistle & J. van Merrienboer (Eds.), *Powerful learning environments: Unravelling basic components and dimensions*. Oxford, England: Elsevier Science.

Moore, M. G. (2007), *Handbook on distance education.*(2nd ed.). United Kingdom: Routledge Publishing Company.

Morling B., & Kitayama S. (2008), Culture and motivation. *Handbook of Motivation Science.* New York, USA: The Guilford Press.

Murray, R. J. & Kane, K. S. (2010), In service of mission: assessing catholic school guidance counselors. *Catholic Education: A journal of Inquiry and Practice, 14(2)*, 173-194.

Needles, B. E., Anderson, H. R., & Caldwell, J. C. (1990). *Principles of accounting.* (4th ed.) USA: Houghton Mifflin Company.

Neiman, S. (2011), Crime, violence, discipline and safety in U.S. public schools: finding from the school survey on crime and safety 2009-10. *National Center for Education Statistics, 85*.

Onchwari, G., Onchwari, J. A., & Keengwe, J. (2008), Teaching the immigrant child: application of child development theories. *Early Childhood Educational Journal, 36(3)*, 267-273.

Orange, C. (2002), *The quick reference guide to educational innovations practices, programs, policies and philosophies*. California: Corwin Press, Inc.

Ormerod, N. (2010), Identity and mission in catholic organizations. *Austrlasian Catholic Record, 87(4)*, 430-439.

Parkay, F. W., & Haas, G. (2000), *Curriculum Planning.* (7th ed.). Needham Heights, MA: Allyn & Bacon.

Piazza, C. C., Fisher, W. W., Brown, K. A., Shore, B. A., Patel, M. R., Katz, R. M., Sevin, B. M., Gulotta, C. S., & Blakely-Smith, A. (2008), Functional analysis of inappropriate mealtime behaviors. *Journal of Applied Behavior Analysis, 36,* 187–204. Retrieved February 04, 2014 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1284432

Richardson, J. W. (2007), Building bridges between school-based health clinics and schools. *Journal of School Health*, *77(7)*, 337–343. USA: American School Health Association.

Ruoling, Z. (2010), On the rationality of college entrance examination analysis of its foundations, functions and influences. *Chinese Education and Society*, *43(4)*, 11-21.

Sadker, D., Sadker, M., & Zittleman, K. R. (2009), *Teachers, Schools, and Society*. (8th ed.). New York: McGraw-Hill.

Sampson, J. P. Jr., Dozier, C. V., & Colvin, G. P. (2011), Translating career theory to practice: the risk of unintentional social injustice. *Journal of Counseling and Development, 89(3)*, 326-337.

Santos, M. J. (2008), Knowledge level of food handlers in portuguese school canteens and their self-reported behavior towards food safety. *International Journal of Environmental Health Research 18 (6)*, 387-401.

Ellyson, S. L., Coldren, J. T., Kestner, J., Fry, W. R., Ragozzine, F., & Haynes, V. (2008), *General psychology*. (3rd ed.). USA: Kendall Hunt Publishing.

Stevens, L. P. et al. (2007), Reconceptualizing the possible narratives of adolescence. *Australian Educational Researcher, 34(2)*, 107-127.

Taylor, H. F., & Anderson, M. L. (2007), *Sociology the essentials*. (4th ed.). USA: Thomson Learning, Inc.

Thomas, H. (2010), Learning spaces, learning environments and the displacement' of learning. *British Journal of Educational Technology, 41(3)*, 502-511. Doi: 10.1111/j.1467-8535.2009.00974.x

Vermunt, J. D. (2003), The power of learning environments and the quality of student learning. *Powerful Learning Environments: Unravelling Basic Components and Dimensions, pp. 109-124.* Amsterdam: Elsevier Science.

Vohs, K. D., & Baumeister R. F. (2008), Can satisfaction reinforce wanting? A new theory about long-term changes in strength of motivation. *Handbook of Motivation Science pp.373-389.* New York, USA: The Guilford Press.

Weimer, M. (2002), *Learner-centered teaching: five key changes to practice*. San Francisco, California: Jossey-Bass.

Weinstein, C. S., Romano, M., & Migano, A. J. Jr. (2011), *Elementary classroom management lessons from research and practic*e. (5th ed.). USA: Mc Graw Hill.

Wohlfarth, D. (2008), Student perceptions of learner-centered teaching. *InSight: A Journal of Scholarly Teaching, 3*, 67-74.

Yesil, R., & Korkmaz, O. (2010), Reliability and validity analysis of the multiple intelligence perception scale. *Education, 131*, 8-32.

Zhang, L. (2010), Study on the satisfaction of the relationship between teachers and students under the impact of double factors in universities - A case study of empirical survey among the students of seven universities in china. *International Journal of Psychological Studies, 2(1)*, 116-121.

Key Educational Scholars

Mikhail Geraskov (1874-1957) Methodological Concepts of Learning Physics.

Mariyana Ilieva

* This article is made with the financial support of the European Social Fund, project № BG051PO001-3.3.06/0026. Mariyana Ilieva has the sole responsibility for the content of the article and it cannot be considered as an official statement of the European Union or of Sofia University "St. Kliment Ohridski", Faculty of Education

Abstract

Mikhail Geraskov is a distinguished Bulgarian educator from the first half of the twentieth century, who developed the scientific foundations of didactics and methodology of training. His work contributed a lot to the development of the Bulgarian pedagogy. The subject of scientific research is didactical conceptions and methodological conceptions of learning. The aim of the research paper is to presents his ideas about particular methods of teaching Physics for high school. Geraskov assumes direct correlation between didactics and methodology. This paper focuses on his ideas about design, technology and methodological requirements for lessons of Physics. He believes that the appropriate methods are determined by the curriculum, set of educational goals and age characteristics, and capabilities of adolescents. In his methodical recommendations he focuses on teaching methods and forms that provoke students' activity. Comparative analysis with publications on the issues set for development of the Bulgarian pedagogic science and the actuality in the modern education system.

Keywords: Education; Design lesson; Methods of teaching; Classroom practice; Historical pedagogy.

Introduction

Mikhail Geraskov is a distinguished Bulgarian teacher from the first half of the twentieth century, who developed the scientific foundations of didactics and methodology of training. In the period 1923 – 1940 he was a lecturer at Sofia University. The period was characterized by the development and influence of the Herbartianism and the Alternative education. During this period at the University taught some of the distinguished Bulgarian educators - professors Dimitar Katzarov (1881-1960), Petko Tzonev (1875-1950), Hristo Negentzov (1881-1956). In the 1920s at the University were formed two major departments the Department of Pedagogy, (1924) it was led by professor Katzarov and the Department of Didactics and methodology, in 1924 headed by Professor Tsonev who attracts Geraskov of academic activity. The period 1921-1950 was characterized by the launch of the development of university courses in methods of teaching various subjects. Geraskov is one of the erudite Bulgarian teachers.

Mikhail Geraskov (1874-1957)

Mikhail Geraskov with colleagues and students at the University, Sofia 1939

The scientific production of Mikhail Geraskov is voluminous and of a varied content. The scientific areas contain Pedagogy, Theory of education, Philosophy of education, Didactics, Methodology of training, Educational psychology, School law, History of international and Bulgarian education.

Despite all these facts in contemporary Bulgarian historiography scientific publications include separate studies of his ideas. The reason for this is the change of political ideology in Bulgaria. In September 1944 a communist regime was imposed in Bulgaria and the country's political, social and cultural structures were radically changed by the ideology of this regime. Thinking people are a barrier before any dictatorship, therefore the first task of usurpers is terror and genocide on a mass scale against the intellectual class. Some of the books by Geraskov have been on the list of books banned by the government. The Bulgarian cultural life was dominated by the communist ideas for 45 years.

The research paper is part of a scientific study, which explores and analyzes the scientific production of Mikhail Geraskov in the field of didactics and methodology of training. The scientific study investigates and presents the didactical and methodological conceptions developed by Mikhail Geraskov. In the context of this research paper contribution is related to the development of this issue in its entirety. The aim of the research paper is to present his ideas on methods of teaching Physics. The following tasks are:

- to present his views on the scientific status of the teaching methodology
- to analyze Geraskov's basic methodological views for teaching Physics
- to define and show their importance and relevance in modern methods in the Bulgarian education

The research is built on the scientific production of Geraskov's work on methods of teaching particular subjects and interpretation of key publications on the topic.

Literature review

The Bulgarian educational history includes separate studies of his pedagogical conceptions. While many studies have been done since then, few of them includes Geraskov's philosophy of methods of teaching particular subjects in school.

Radev (1988, 1999, 2002) developed the theme of pedagogical thought in Bulgaria in the first half of the twentieth century. He presented basic facts about ideas of Geraskov. Radev described his contribution to the development of the Bulgarian pedagogy, especially of the didactics and methodology of training.

In the some research about the history of the methodology of teaching the authors very briefly wrote for Geraskov. Radeva (2009) presented information about his methodological concept of learning History. Antonova (1983) wrote about his methodological concept of learning Chemistry. Each of the authors briefly presented his contribution to the development of the methodology of training.

Yordanova (2005) examined the methodological views of Geraskov for learning Pronunciation in the elementary school. In conclusion the author expressed position that he is one of the most important educators of scientific thought and his methodological concept of learning Bulgarian language has actual dimensions and value.

Petrova (2005) presented in detail information about his methodological concept of learning Bulgarian language. In summary the author wrote that the methodological heritage of Geraskov is valuable. She defined him as a progressive scholar who put rational requirements about the design and the technology for lessons of Bulgarian language. Gulabova had such task of her article (2005). She briefly described the ideas of Geraskov about the methodological concept of learning Particular subject.

Ilieva (2012) described in detail Geraskov's basic methodological views for teaching Bulgarian language and Mathematics. In summary the author indicated that he has important contributions to the development of methods of teaching Bulgarian language and mathematics. In conclusion she maintained that in the middle of the twentieth century his ideas are highly appreciated and influenced to the other scholars in this area.

In conclusion, each of the authors strongly pointed his contributed to the development of the teaching methodology and the relevance of his ideas. But the studies are not enough to bring out the Geraskov's fundamental ideas about design, technology and methodological requirements for lessons of particular subjects. The aim of the research paper is to presents his ideas about particular methods of teaching Physics. The research should show another aspect of his pedagogical heritage and should enrich the Bulgarian historiography. Comparative analysis with publications on the issues set for development of the Bulgarian pedagogic science and the actuality in the modern education system.

Scientific status of the teaching methodology by Mikhail Geraskov

Geraskov distinguishes didactics and methodology. He believes that didactics contains theory and principles of teaching methods. Teaching methodology contains theory and technique of teaching particular subjects. He assumes that between didactics and methodology there is a direct correlation. Teaching methodology has a specific task - to examine and specify the use of didactic and pedagogical training rules in order to achieve the best educational outcomes. He defines methodology as a special didactics (Geraskov, 1922, p. 3). His view is different from the modern educational theory (Radev, 2005). However his idea about the correlation theory – practice is important. This shows that his idea is still relevant today.

In his view, didactics modify the content according to the development of students. He argues that it is impossible training to be tailored to the individuality of each student. However, it is necessary to develop problems, according to the characteristics of the age groups. He makes the division according to the development of students and determines - Didactics of primary school, Didactics of secondary school and Didactics of high school. Each of them has special task-driven objectives. Compliance with the psychophysiological opportunities for students of different age groups is important and necessary for the education. The author claims that pointing out that in

developing the science standards should specify the individuality of students (Geraskov, 1921, pp. 17-20).

This division can certainly be extrapolated as a correlation between didactics and methodology. The following table (Table 1) represents the correlation theory – practice and the didactics modify the content. Didactics of primary, secondary and high school in content are actually modern subject theory. Although Geraskov puts them only according to age groups, he does not give a prescription on curriculum. He recommends specific tasks to involve the organization, compliance with laws and application of specific methods. Such view is close to the modern understanding of the relationship of the individual school didactics and methodologies. In first half of the twentieth century the school levels of Bulgarian education were primary school, secondary school and high school. In his scientific concept Geraskov covers the entire education system. In the modern concept of school didactics there is no such division, but similar differentiation will contribute to improving the quality of education. His idea is modern. The sciences principles should be according to the characteristics of the age groups. Dividing a system into its separate parts is considered support to the proper organization of training and the use of appropriate methods. In practice, each of the steps in education should be to promote the development of students. The educational goal is possible when educational system is consistent with psychology of students. These conditions influence the quality of education.

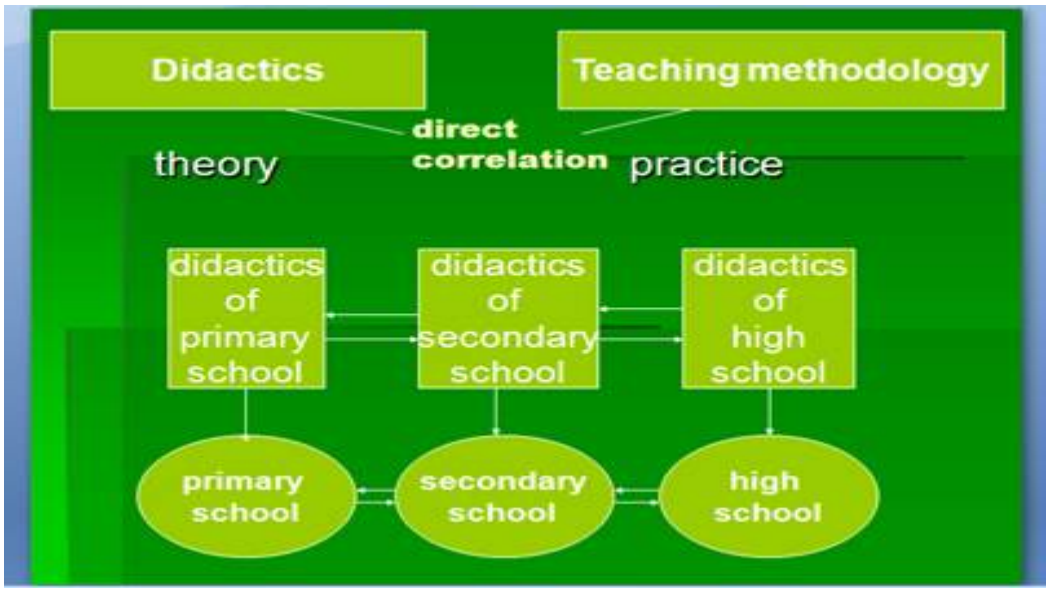


Table 1. The correlation between didactics and methodology

Characteristic of the scientific publication of Mikhail Geraskov in teaching methodology

In 1922 the first edition of the book of Mikhail Geraskov *Methodology for primary and secondary education* which is a guide for students in Teachers' institutes, schools, teachers and self-improvement was released. It is dedicated to the methodology of the particular subjects. The book was reprinted four times consecutively, the second edition was in 1924, the third in 1928 and the fourth - in 1942. This shows the best estimate, which is given to the work of Geraskov. Each edition is tailored to the school curriculum of the Bulgarian educational system and changes in it. In 1946 the book was published under the title *Methods of subjects in school.*

The period was characterized by the development and influence of Herbartianism and European reforming education. In the first half of the twentieth century in the pedagogical literature was using the methodologies of Stephan Basarichek (1848-1918) and Todor Benev (1861 -?). Basarichek was a Croatian educator, lecturer in a teaching school in Zagreb, where he trained many Bulgarians, who would later work in the field of education. He was a follower of Herbartianism. His views had a strong influence on the Bulgarian educational thought and practice to the spread of Herbartianism immediately after the Liberation. His scientific

publication was translated into Bulgarian. During this period, many pedagogical literature and books of Basarichek were used for pedagogical disciplines teaching future teachers. In period 1903-1906 were published three volumes of the book by Todor Benev, Sava Velev (1869-1913) and Vasil Nikolchov (1873 -?). They are dedicated to pedagogy, didactics, teaching methodology and history of education. The second volume is *Methodology*. Benev is entirely in the spirit of Herbartianism specific instructions and followed the instructional models of education. During this period, only individual articles existed in Bulgaria, many of which were devoted to the methodology in the primary school. This is inherently Geraskov's great contribution to the development not only of the methodology, but also of the didactics and pedagogy in general. He presents his personal position depending on the Bulgarian reality and educational system.

In the preface to the first edition, Geraskov (1922, pp. 1-2) points out the reasons which prompted him to write this paper. The Bulgarian educational print often considered questions of methodology in different subjects, but they were isolated and represented separate and distinct concepts. The purpose of his work is to give a global and contemporary view, which serves to prepare future teachers and those who seek to enhance their pedagogical training - for self-education of teachers.

In considering methodological issues in individual subjects Geraskov adopts an idea about the subject of the special methodology. In characteristic style Geraskov presents the development of ideas and confirmation of each subject in historical aspect. He points out specific objectives and tasks of the subjects, starting from general educational purposes, the place they occupy in the curriculum and requirements for the selection and order of the material. To achieve his intention Geraskov presents views on the conduct of individual units' methodological subjects and recommends concrete implementation of teaching methods and forms. He emphasizes the relationship with psychology, while examining the methodology and presentation of various subjects puts particular emphasis on the psychophysiological basis of the student. To achieve

educational goals and the examination of theory and Geraskov shows that a good methodology and application of each method is in direct correlation with the knowledge of the field of psychology. He focuses on the educational and practical importance of each subject. He presents in detail the particular methodological design of a learning unit.

The historical context of the relationship between didactics and methodology is amended in the process of building a system of pedagogical sciences. This is indicated by modern scholars of Bulgarian pedagogy for example Petar Petrov. In the first half of the twentieth century and before that, methodology is accepted as a normative part of the pedagogical theory and its content presents primarily the specific guidance for teaching (Petrov, 1998, pp. 16-17). This aspect shows the idea about the subject and tasks of the special methodology. The structure is consistent of the presentation and the importance of the subject key concepts associated with it and its development as a science.

Geraskov briefly presents the evolution of ideas and presentation of each subject in historical aspect which is a characteristic of his style of writing. He points out specific objectives and tasks of subjects determined by the total educational purposes. He presents his position about the curriculum and requirements for the selection and order of the knowledge. Geraskov expresses views on the conduct of teaching particular subjects and recommends specific application of teaching methods. This is determined by the compliance and implementation of the principles of education. He emphasizes the relationship with psychology and methodology in addressing the various subjects and puts particular emphasis on the psychophysiological progress of students. He thinks that the best methodology and application of each method is in a direct correlation with the knowledge of psychology. It is important for the educational purpose. He also focuses on the educational and practical significance of each school subject (Geraskov, 1946).

The meaningful analysis of his scientific publication focuses to this problem, in conclusion to that the author consistently adopts his instructional model of education with the four steps in teaching. They are:

- definition of the aim of the lesson
- preparation for teaching the new curriculum material
- teaching new knowledge
- practice knowledge

He adopts a direct relationship between school levels. This is clearly expressed in the setting of individual goals and objectives of training in each subject. He focuses on the methodology of primary school, as it laid the foundations of the education of young people, particularly in reading, writing and arithmetic, which are not only skills necessary for personal and social development of adolescents, but also a prerequisite for higher knowledge scientific fields. Geraskov puts to correlation emphasizes theory – practice (Geraskov, 1921, p. 177).

His instructional model of education should not be directly related to the model of Herbartianism (see Table 2). He takes only a few aspects of this model. The direct correlation between school levels is pronounced by placing individual goals and objectives in teaching various subjects. The three school levels of Bulgarian education, in this period, are primary school, secondary school and high school. Each of them has specificity determined by the psychophysiological progress of the students. This determines differences in recommended methods. Also each subject area requires the use of certain methods. This is especially true for the Natural Sciences of subjects in which Geraskov considered the most appropriate the use of the inductive method. In the methodological views of Geraskov thoroughly is presented the idea of the need to implement a variety of methods. For each school grade in different subjects, he indicates which methods and forms of training are best suited for use (Geraskov, 1944).

THE INSTRUCTIONAL MODEL OF MIKHAIL GERASKOV	THE INSTRUCTIONAL MODEL OF HERBARTIANISM
1. Definition of the aim of the lesson	1. Preparation
2. Preparation for teaching the new curriculum material	2. Presentation
3. Teaching new knowledge	3. Association
4. Practice knowledge	4. Generalization
	5. Application

Table 2. Similarities and differences between the two instructional models of education

Teaching methodology of Physics

Geraskov's ideas support the development of Bulgarian pedagogical thought; more specifically, he develops methods of teaching particular subjects for high school. It is because in the first half of the twentieth century different scientific publications focus on the methodology for primary school. Contrary to Geraskov in their issues on the methods of teaching particular subjects including the three school levels which are primary school, secondary school and high school. In his methodical recommendations on particular subjects, briefly, specifying certain teaching methods and forms suitable for use in the high school. He believes that the appropriate methods are determined by the curriculum, set of educational goals and age characteristics, and capabilities of adolescents. In his methodical recommendations he focuses on teaching methods and forms that provoke students' activity. This implies to a greater degree the use of heuristic learning and development. Along with the induction for this school degree he recommends more frequent use of deductive method. He emphasizes the need for the exercise of inductive reasoning. Educational content and underlying educational purpose suggested enriching student's awareness through presenting a clear realistic picture and knowledge in various scientific fields in a systematic form. The knowledge must be practical and focused. Geraskov (1946, p. 84) stated

that, “Methods of teaching must influence the feelings of the students and their critical attitude towards things in public life”.

The educational aim of Physics in high schools is to acquire knowledge of science, scientific methods of observation and study. Physics is an inductive science. This science is the result of inductive reasoning. Thus, according to Geraskov teaching Physics must be based on the experiment. The main method of teaching Physics is induction and parallel with it is the analytical method. Geraskov determines the methods of teaching. They are direct instructional method, induction and deduction. In that process, experience is not mere observation, susceptible to the tricks of our perception, but is based on systematic observation, comparison and verification. The experiments should be conducted exclusively for the purpose of observation and information gathering, followed by the formalization of knowledge (Geraskov, 1928, p. 173).

Geraskov believes in the importance of achieving greater connection between educational purpose, theories and practices on Physics education. He focuses on laboratory activities. The teacher’s guidance and instruction have ranged from highly structured to open inquiry. Laboratory activities’ goal is to promote central science education goals including: understanding of scientific consepts, development of scientific practical skills and problem – solving abilities, and interest and motivation. Scholarly efforts have identified serious mismatches between goals for science education and learning outcomes visible in school graduates (Geraskov, 1928, pp. 175-177).

The way people learn and process new information that they are taught is one of the many factors that makes each individual person unique. While some people learn quickly by actually performing a task for themselves, others learn better by watching someone doing the task or by simply hearing the task explained. The methods that each prefers for learning is known as their own unique learning style. Geraskov believes for teachers’ understanding of their student’s

learning style can be the key to unlocking their full potential and making difficult concepts seem as easy as they can be. This methodological assumptions of Geraskov is determined by his ideas of significance of psychophysiological progress of students. The teacher must know their students (Geraskov, 1923).

In Physics education Geraskov stresses the value of laboratory experiment and activities, demonstration and models. Therefore, graphic organizers are visual representations of knowledge that can support theoretical knowledge. They provide a frame for teachers and students to visually identify important facts, organize information, and record relationships between facts and ideas. These tools help students to practice higher level thinking skills and apply these skills to real world situations. Different demonstrations, models and experiments help students to remember information, understand how pieces of information are related, better understand the learning material and engagement of multiple intelligences. They are especially effective in explaining and illustrating abstract concepts (Geraskov, 1928, pp. 178-179). Geraskov creates the lesson plan for forming knowledge of Physics with the four steps in teaching. They are:

- introduction
- engagement in physical experience
- performance characteristics make the phenomenon
- defined as the Physical law
- exercises

In his ideas about structure, technology and methodological requirements of lesson Geraskov firstly sets teachers' preparation and design of Physics lessons. It includes theoretical, practical and methodological aspects. He pays particular attention to the methodology of the teacher about the students' understanding of physical truths and the causal relationships between them. The second condition are teaching aids which are very important. Equipment is needed to produce natural experiments. The experiments in the classrooms must be under school time. He

recommends selecting those that require less time and which are most accessible. In the statement of the new knowlegde the teacher makes first physical experience. The experiments are made most often by the teacher, but where possible and appropriate to engage students. This is important for the active participation of the students in training. After performance the teacher points characteristics the phenomenon and the comparison with other similar events. He specifies the relationship and defines the physical law. In drawing a few truths in attempts to observe the sequence. Geraskov writes that the lessons of Physics cannot give an overall scheme, but the statement should follow the main points. The practice knowledge is best if you allow students to perform exercises alone. This can be carried out through experiments with a total exposure to the material or items with practical significance. In this part of lesson, the teacher and the students can make various experimentals. Thus Geraskov puts the emphasis on students' activity. He recommends that outside school hours are appropriate for students to visit places in which to see the practical application of Physics. Practical exercises in physics are important for education. Unfortunately, Geraskov says, most schools do not have the necessary facilities. It is important that these exercises allow students to make at least the most important attempts. Empirical knowledge is very important in learning of Physics (Geraskov, 1928, p. 177). These ideas are close to modern methodology. This highlights the principle of transparency, which is expressed by Geraskov. His ideas are interesting and contemporary. They may support improving the quality of education.

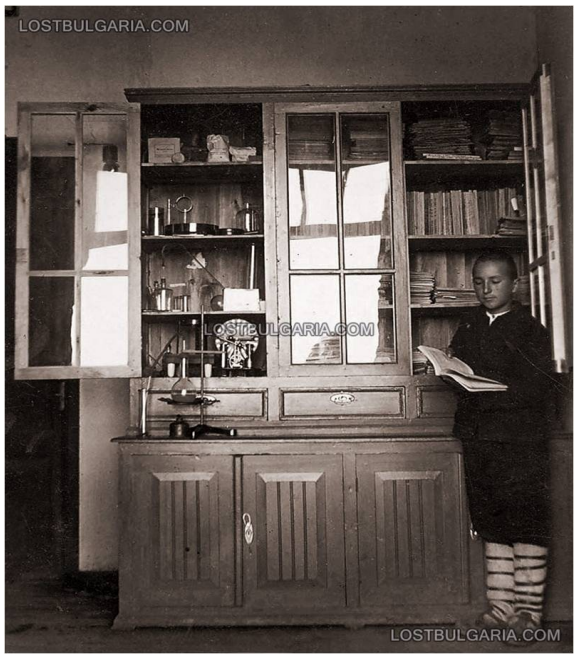
The hygienic working conditions that adversely affect the physiological status of students are very important (Geraskov, 1928, p. 188). In education these subjects presented the idea of environmental and health education, which requires pupils to form a conscious and caring attitude towards their own health and the environment with all its components - physical, chemical, biological, cultural, historical and others. It puts the other cross-curricular education, which as mentioned is expressed as an idea by Geraskov. The idea that physics is an inductive

science and focus on the physical experiment in education is in modern pedagogical science (Raykova, 2008). This implies respect for visual principle. M. Geraskov requirements on teacher's education for the learning process have now become outdated. However, the planning and execution of specific physical experiments for achieve clear and thorough knowledge of the students are important points. The idea of Geraskov for activity in the training of students is still current today. Their participation in the conduct of specific experiments, either alone or with the teacher is important.

Methodological concepts and requirements that are present in modern methods show that the ideas of Mikhail Geraskov in this aspect are still relevant. Today it is recognized that the practical experience requirement is related to the logical structure of the curriculum and meets the purpose of the experiment. Proper organization of supervision during the event is important to direct properly the attention of the students. Emphasis is placed and the optimum number of experiments and preliminary preparation of teachers for the experimental part of a lesson. It helps to perform successful and safe experiments. This is connected with the right technique. Clearly expressed is the idea of teaching students to independence of thought and action, giving them the opportunity to perform experiments under the instructions of the teacher. The training presentation of the material should be presented according to age groups - in a narrative or a lecture form, which is preferred in the high school, in parallel with the discussions it is important to combine demonstration of experiments and other visual aids.

In general, these requirements are expressed today in the methods of teaching Physics; they are similar to those posed for the Bulgarian teachers from the first half of the twentieth century when the importance of educational resources was also stressed. Although Geraskov defines them as high school requirements. The model of learning in modern education is different in degree from that of Geraskov's. However his idea of the place of experiment in the exhibition of new teaching

material is preserved today. The methodology of training as the most effective approach is considered a removal of physical laws and rules of the experiment.



The Physics classroom in the 1930s

www.lostbulgaria.com

Scientific production of Mikhail Geraskov

Photo by: M. Ilieva

Conclusion

The contribution of Mikhail Geraskov in the methods of teaching particular subjects can be seen in several aspects. In the time in which he lived and worked, the Bulgarian pedagogical thought experienced a deficit in its methodological developments. Geraskov fills this gap and it worked very well. His *Methodology* was reprinted several times and is one of the main guidelines for schools to prepare teaching staff. His ideas were highly appreciated and influenced other researchers in this field. He makes a significant contribution to the development of teaching methodology of the high school. He believes in basic principle which emphasize that the school organization must be determined by the specifics of the students' specifics. He presents his personal position. He does not fully accept the ideas of Herbartianism. He wishes the methodological recommendations are guiding thought for teachers in organizing and

implementing their practical work, as well as an objective criterion for discussion of issues in this area. One of the major achievements of Mikhail Geraskov is improvement of methodology for Bulgarian school. He made valuable contributions to science. Before 1950's he was the mentor for scholars who worked on this topic.

The educational politics in Bulgaria for the past 20 years has been focused on improving the quality of education, in particular through increasing the capacity for teaching. One of the strategies to improve the quality of Bulgarian education is to establish teaching practices that allow a greater interaction between the teacher and the student, so as to assure a constant monitoring of the teaching and learning process in order to quickly identify problems and to support students that may face difficulties. The others strategies are to focus on the learning process of each and every student and to establish mechanisms for the participation of the students in the education. The History can teach us. Geraskov's views of methodology in the high school are actuality in the modern educational system. There is a significant similarity with the ideas in modern education. In conclusion his ideas are relevant to contemporary educational practice. The model of learning in modern education is different in a degree from that of Geraskov's. However his idea of the place of experiment in the exhibition of new teaching material is preserved (today). His methodological recommendations are relevant for the contemporary Bulgarian education.

References

Antonova, L. (1983), The methodological heritage of Geraskov about learning Chemistry. In: *Biology and Chemistry.* Vol. 6. Sofia: Press Ministry of education [in Bulgarian].

Geraskov, M. (1921), *The Didatics or the theory of training.* Vratza: St. Tzekov Press [in Bulgarian].

Geraskov, M. (1922), *Methodology for primary and secondary education.* Vratza: St. Tzekov Press [in Bulgarian].

Geraskov, M. (1923), *Learning of students in high schools from didactic perspective*. Vratza: St. Tzekov Press [in Bulgarian].

Geraskov, M. (1928), *Methodology for primary and secondary education.* 3rd ed. Vratza: St. Tzekov Press [in Bulgarian].

Geraskov, M. (1944), *The basics of Didactics.* 2nd ed. Plovdiv: H.G.Danov Press [in Bulgarian].

Geraskov, M. (1946), *Methods of subjects in school.* Sofia: Hemus Press [in Bulgarian].

Gulabova, M. (2005), Learning of Particular subject in Methodology by Mikhail Geraskov. In: *National Scientific Session "Pedagogical Contributions*". Veliko Tarnovo: Univ. Press St. Cyril and St. Methodius, pp. 147-150 [in Bulgarian].

Ilieva, M. (2012), *Mikhail Geraskov (1874-1957) methodological concept of learning Bulgarian language and mathematics.* In: Year-book of Sofia University "St. Kliment Ohridski", Faculty of Pedagogy, Book – Pedagogy. Vol. 104. Sofia: Univ. Press St. Kliment Ohridski [in Bulgarian].

Yordanova, D. (2005), Look at the methodological views of Mikhail Geraskov about learning Pronounce in elementary school during the first half of the twentieth century. In: *National Scientific Session "Pedagogical Contributions*". Veliko Tarnovo: Univ. Press St. Cyril and St. Methodius, pp. 82-86 [in Bulgarian].

Petrov, P. (1998), *Didactics.* Sofia: Veda Slovena – JG Press [in Bulgarian].

Petrova, Z. (2005), The fundamental aspects to language learning in the methodological work of Professor Mikhail Geraskov. In: *National Scientific Session "Pedagogical Contributions*". Veliko Tarnovo: Univ. Press St. Cyril and St. Methodius, pp. 115-122 [in Bulgarian].

Radev, P. (1988), *Development of ideas about structure of educational process.* Plovdiv: Univ. Press Paisii Hilendarski [in Bulgarian].

Radev, P. (1999), *Temathical indexes and paradigmas in Bulgarian workbooks and handbooks of didactics.* Plovdiv: Univ. Press Paisii Hilendarski [in Bulgarian].

Radev, P. (2002), *History of Bulgarian education.* Plovdiv: Univ. Press Paisii Hilendarski [in Bulgarian].

Radev, P. (2005), *General school didactics.* Plovdiv: Univ. Press Paisii Hilendarski [in Bulgarian].

Radeva, M. (2008), *School history education in Bulgaria 1878-1944.* Sofia: Gutenberg Press [in Bulgarian].

Raykova, Z. (2008), *Development procedural skills in science education – constructivist approach.* Plovdiv: Univ. Press Paisii Hilendarski [in Bulgarian].

Sofia University "St. Kliment Ohridski" (1940), *Almanac of Sofia University St. Kliment Ohridski*, *1888 – 1939.* Sofia: Univ. Press. St. Kliment Ohridski [in Bulgarian].

Guide for Authors

Article structure

Abstract

A concise and factual abstract is required (maximum length of **250 words**). The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

Keywords

Immediately after the abstract, provide a maximum of **6 keywords**.

Introduction

Present purposes of the study and provide background for your work.

Literature Review

Include a pertinent literature review with explicit international connections for relevant ideas. Discuss the findings of published papers in the related field and highlight your contribution.

Methodology and methods

Provide sufficient detail to allow the context of the work to be thoroughly understood and/or for the work to be reproduced. Provide sufficient detail for readers to understand how you engaged in your inquiry. Clear descriptions of your context and participants along with strategies used to collect and analyze data should be described.

Discussion

This section should explore the significance of the results of the work, not repeat them. Combining your results and discussion into a single section may be suitable. Returning to relevant literature from the introduction should show how your work connects with or interrupts already published literature.

Conclusions

The main conclusions of the study may be presented in a Conclusions section, which can include the main findings, the implications, and limitations.

Appendices

If there is more than one appendix, they should be identified as A, B, etc.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article, using superscript Arabic numbers.

References

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa).

Reference style

Text: Citations in the text should follow the referencing style used by the American Psychological Association (APA). Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5.

List: references should be arranged first alphabetically and then further sorted chronologically if necessary.

Reference to a journal publication:

Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2010). The art of writing a scientific article. *Journal of Scientific Communications*, 163, 51–59.

Reference to a book:

Strunk, W., Jr., & White, E. B. (2000). *The elements of style*. (4th ed.). New York: Longman, (Chapter 4).

Reference to a chapter in an edited book:

Mettam, G. R., & Adams, L. B. (2009). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.

Please follow the checklist:

* Times New Roman font (size 12)

* Double-spacing throughout the document; paragraphs, justify.

* Double space (instead of indent) to designate a new paragraph or section

* Page numbers at the bottom center of each page

* Top, bottom, and side margins 0.87" or 2.2 cm

* Page that includes title, authors, their affiliations, their contact information, and the topic of the submission

* Authors and affiliations repeated at the beginning of the body of the paper

* There is no limit of words or pages, but manuscript too short or incomplete will be rejected.

IAFOR Journal of Education is following the guidelines and advice proposed by top SSCI academic journal Teaching and teacher Education on their website.

iafor

The IAFOR Journal of Education

Volume 2 - Issue 1 - Winter 2014