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Developing an Internet-Based Community for Special Education in Bulgaria

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Abstract: Research on special education practices in Bulgaria to develop an Internet-based community of practice is now underway. The study will answer a call to action to test the potential of online communities of practice (OCoPs) to close the gap between education research and practice. A secondary goal is to update findings about the feasibility of Internet-based instruction in Bulgaria. Qualitative and quantitative methods will be used to develop and evaluate a website and propose design principles for future OCoP development. Research has been guided by situated learning and legitimate peripheral participation theory as well as the design-based research approach. This study was conceptualized within the strong education tradition and openness to technology that prior research has found in the Bulgarian culture.

Introduction

Impetus for the proposed research comes from a 2003 article published in *Exceptional Children* that examined the community of practice (CoP) model as a framework for integrating education research and practice (Buysse, Sparkman, & Wesley, 2003). The authors argue that communities of practice "offer the intellectual resources to solve even the most complex education problems by adopting an approach to scientific inquiry that views [research and practice] as part of the same process, rather than separate endeavors" (Buysse et al., 2003, p. 275). The authors conclude their article with a call to action for researchers to incorporate a CoP perspective into current research. Moreover, they list special education as an example of an area that could connect researchers with practitioners.

The result of this project will be a website that is custom-designed to provide information about learning disabilities to Bulgarian educators. More than a website, this online community of practice (OCoP) will provide forums where teachers can discuss issues with other practitioners as well as researchers and special education experts. The name initially proposed for the OCoP is Special Ed Bulgaria (SEB). Participant use of the website will be evaluated to determine to what extent the site helped close the researcher-practitioner communication gap.

Before delving into a discussion of the supporting literature, underlying theories, and methods, it is important to note two significant factors. First, given that much of the research will take place in Bulgaria or be translated into or from Bulgarian, there will be a certain amount of data lost in translation. Further, the distance between Bulgaria and Australia will limit the extent and types of research that can be conducted. Nonetheless, it is predicted that the results of this study will break new ground in bringing insight into the Bulgarian education system as well as the feasibility of establishing web-based education systems in Bulgaria and demographically similar countries. Second, this research would not be possible without the assistance of the researcher's personal contacts from Bulgaria. The inexpensive translation services and housing assistance provided through these contacts make the project affordable. Moreover, the contacts provided great insight into Bulgarian culture, history, politics, and education that lead to this project's conception.

Literature Review

One of the most important reasons to connect research with practice is to provide professional development opportunities to educators that will, in turn, improve teaching (Buysse et al., 2003; Carnine, 1997). The main goal of SEB is to provide professional development opportunities in the field of special education to Bulgarian educators. This goal is supported by a large body of research that indicates OCoPs, discussion groups, and computer-based instruction provide a viable option for the professional development of teachers (Barab, MaKinster, Moore, Cunningham, & The ILF Design Team, 2001; Hough, Smithey, & Evertson, 2004; Pennington & Graham, 2002; Wood, Cumpson, & French, 2003).

Bulgaria is a good choice for establishing and evaluating an OCoP on special education for several reasons. First, use of the Internet is rapidly increasing throughout Bulgaria. According to the United Nations (2005), from 1992 to 2003 the number of Internet users in Bulgaria increased from 200 to 1,545,143, about 20% of the population. Second, in Bulgaria, funding to provide in-school experts or train teachers about special education is generally not available, according to Professor Mira Tzvetkova-Arsova in the Department of Special Education at Sofia University (personal communication, August 2004). This being the case, the diagnosis of students with less-severe learning disabilities (such as dyslexia or mild forms of autism) is not usually possible. Research by Cholakova & Georgieva (1996) supports this claim, reporting that only students with intellectual or physical disabilities are engaged by the Bulgarian special education system.

A secondary motivation for the development of SEB comes from research conducted by Reeves, Harmon, and Jones (1993) that introduced "a model for analysis of the potential for CBI [computer-based instruction] in the education and training systems of third world countries" (p. 59). To explain how to use the model, Reeves et al. chose to apply it to Bulgaria. The preliminary research presented found that "Bulgarian economic conditions cannot support major investment in new instructional technologies" (Reeves et al., 1993, p. 61). "On the positive side, Bulgaria possesses a strong education tradition and a cultural openness to innovation and technology. It has a wealth of available technology in comparison with many developing countries. … Bulgaria has a number of recognized leaders in the field of instructional technology. The workforce retraining needs and the national aspirations support innovative approaches to instruction" (Reeves et al., 1993, p. 63). Given that the work of Reeves et al. was conducted in 1993, it is time for a follow-up study. A secondary goal of the proposed research will be to update the Reeves et al. findings on the feasibility of implementing computer-based instruction systems in Bulgaria.

Review of Related Websites

There are many websites that provide substantial amounts of general electronic teacher resources. These sites can be defined as education portals—website gateways to a broad array of online resources and services. Examples include A to Z Teacher Stuff (atozteacherstuff.com), Education World (www.educationworld.com), ProTeacher (www.proteacher.com), and the Teacher's Guide (www.theteachersguide.com). Though these websites provide discussion forums for teachers and general opportunities for professional development, their target audience is too broad for them to be considered OCoPs. Instead, they serve as repositories of articles and lesson plans for all subjects. By attempting to reach large audiences, the websites lack an anchoring theme, which is a key criteria for successful CoPs (Hough et al., 2004).

In contrast, the Teacher's Info-Port to Technology (tipt3.utoledo.edu) website has an anchoring theme—teaching with technology—but does not provide discussion forums or any way for users to discuss as they learn. The ability to interact with peers and mentors is a requirement for the existence of an OCoP (Hough et al., 2004; Owston & Wideman, 2002; Pennington & Graham, 2002; Schlager & Schank, 1997). In addition to discussion forums, e-mail ListServs, and online conferences can provide the social interaction required for the existence of an OCoP. Research by Pennington and Graham, however, found that participation in a ListServ is not enough to be considered professional development. "It appears that listservs may best be described as a 'tool' to assist teachers in their professional development goals and/or activities, but subscribing to [and participating in] a listserv, in and of itself, may not be considered professional development" (Pennington & Graham, 2002, p. 401). In response to these findings, SEB provides online discussion forums complimented by targeted special-education information through overview and research articles, website links, lesson plans, and a glossary terms.

Tapped In (tappedin.org) is an example of a website specifically designed to be an OCoP with the aim of offering teacher professional development opportunities (Schlager & Schank, 1997). The two main differences between SEB and Tapped In are: SEB is a simple text-based website with very few graphics and SEB will be focused on a small target group of users interested in one specific area of education. The reason for keeping the design of SEB simple is to maximize download speed. According to a representative of the Internet Society Bulgaria, the average computer at K-12 institutions with Internet access in Bulgaria has a Pentium II, 433MHz processor, 64MB of RAM, and a 33.6K dial-up modem and runs Windows 98 (J. Velkova, personal communication, August 2004).

The ILF (ilf.crlt.indiana.edu) website is similar to Tapped In but specifically targets science and math teachers interested in employing inquiry-based teaching strategies in the classroom (Barab et al., 2001). Research on ILF reports difficulty in facilitating online discussion (Barab et al., 2001). Barab et al. (2001) list the following questions: "How can we help teachers break down the walls of isolation, how do we get teachers to critically reflect on each other's teaching, and how do we do this in an on-line environment?" (p. 4). To address these questions, the

researchers set out to redesign ILF and then reevaluate the success of online discussions and overall sociability. A more attractive home page was created and personal welcome-messages are now sent to new users with information about how to get started using the site. ILF staff now proactively track discussion forum conversations and suggest other conversations to visit and discussion themes. A link to a concise text-based overview of how to use the site was also added. Though still in the early stages of design, these recommendations will be taken into consideration as SEB development progresses.

On a final note, there are several websites available that provide all of the aspects of an OCoP for special education including the Council for Exceptional Children (www.cec.sped.org), the International Dyslexia Association (www.interdys.org), LD Online (www.ldonline.org), and Schwab Learning (www.schwablearning.org). The difference between these sites and SEB will be the size of the target population and the breadth of special education topics covered. SEB will seek to provide only the basics about special education in an effort to avoid overwhelming users.

Theoretical Framework

The theoretical framework underpinning the proposed research has to do with the CoP concept and situated learning and legitimate peripheral participation theory developed by Lave and Wenger (1991). The CoP concept was developed to explain the process by which a novice builds an understanding of an expertise in a given field. According to Lave and Wenger (1991), this process is often observed when "old-timer" community members sponsor "newcomers" and gradually induct them into the community through an apprenticeship-master-like progression. Participation in the community is described as, at first, being legitimately peripheral but increasing in engagement and complexity over time. The meaning of the knowledge that exists in the community is understood within the context created by that community (i.e., the situation).

Design-Based Research

Design-based research is a research design framework that provides guidelines for analyzing the research problem, developing solutions within a theoretical framework, evaluating solutions, and documenting results. One benefit of this approach is that it allows for the incorporation of both qualitative and quantitative methods (Collins, Joseph, & Bielaczyc, in press). In addition, the approach suits the use of technology-based solutions in real-world contexts (Reeves, 2000).

In addition to designing a product, an important design-research goal is to refine design theories and propose new design principles in an effort to generalize results (Reeves, 2000). Unlike generalizations from positivist research, generalizations from design-based research are not assumed to be correct in all similar situations. Rather, they help communicate relevant implications to educational designers and researchers and invite discussion. The design principles that come from design-based research are one of the main reasons that the approach is so valuable (Design-Based Research Collective, 2003; Reeves, 2000). The principles are a way of documenting all of the guiding principles from the theoretical framework and literature review and either validating or modifying them based on the results of a study. The following bullet points nicely summarize the design-based research approach:

- address "complex problems in real contexts in collaboration with practitioners,"
- integrate "known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems," and
- conduct "rigorous and reflective inquiry to test and refine innovative learning environments as well as to define new design principles." (Reeves, 2000, p. 26)

Methodology

This study is organized around two research phases: needs assessment and formative evaluation. Depending on OCoP success, effectiveness and impact evaluations (Reeves & Hedberg, 2003) may be proposed for doctoral research. At the time this paper was written, the research proposal had been approved, ethics process completed, and prototype website posted to the Internet, www.specialedbulgaria.org, see Figure 1 and Figure 2. The

needs assessment and formative evaluation had not yet occurred. The prototype website was developed with Dreamweaver and hosted on the Internet through an inexpensive Linux-based hosting account. Much of the content on the prototype website and its organization is based on a recent, introductory special-education textbook from the United States (Gargiulo, 2006). The discussion forums are powered by phpBB, an open-source bulletin board package with complete Bulgarian language translation for links, buttons, and help documentation.

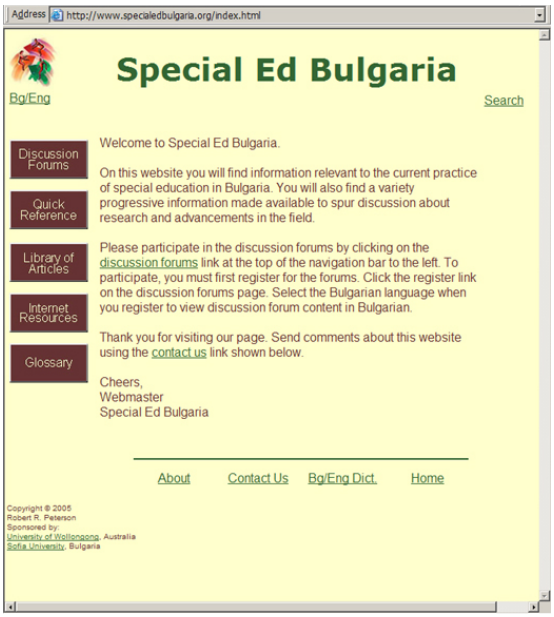

Figure 1: Prototype Special Ed Bulgaria Home Page in English www.specialedbulgaria.org

Figure 2: Special Ed Bulgaria Home Page in Bulgarian http://www.specialedbulgaria.org/bg/index_bg.html

Needs Assessment

The purpose of the needs assessment is to characterize the target audience and to "identify the critical needs that the proposed interactive learning system is intended to meet" (Reeves & Hedberg, 2003, p. 60). The results of the needs assessment may include revised project goals and questions and major revisions to the prototype website. The main source of data for the needs assessment will be personal interviews with Bulgarian special education experts, special education practitioners, K-6 educators with limited to no special education experience, and possibly, representatives from Bulgarian education organizations. The researcher will be in Bulgaria for one month at the beginning of the research project and will interview 8 to 12 participants. The participants will be selected at the discretion of the research contact in Bulgaria, Professor Mira Tzvetkova-Arsova in the Department of Special Education at Sofia University.

Each participant will be visited twice for interviews. During the first interview, general questions about special education will be asked such as, "Tell me about your experience with special education." General questions will also be asked about Internet use and access. During the second interview, a brief usability test will be conducted using the prototype website. The goal of the usability test will be to observe participant skill with the Internet and receive preliminary feedback on the prototype's design. Think aloud techniques will be used to determine what the participant is thinking and how problems are solved. Participant actions will be recorded, timed, and coded as described by Barnum (2002). Throughout the interviews, participants will be informally evaluated for their knowledge of special education practices in Bulgaria and worldwide. During the formative evaluation phase of the research, a follow-up evaluation will be conducted for use as an indicator of learning facilitated by the OCoP.

Interview questions will be divided into experience, opinion, and knowledge questions, as described by Patton (2002), as well as task-related questions used for the usability test. The majority of questions will be experience, opinion, and task based except for those related to the special education knowledge evaluation. All interviews will be conducted in English. At the end of the needs assessment, the alpha website will be posted to the Internet for evaluation. Two versions of the OCoP will be developed. One may focus users to brief case studies about students with learning disabilities. The other may focus users to general information about learning disabilities. Focusing would be engineered through the design of the OCoP homepage.

Formative Evaluation

After the alpha version of the website is posted, a formative evaluation will be conducted that will include expert reviews, website statistics analysis (page hits), a usability test, and user survey. The purpose of the formative evaluation is to provide information about "creating, debugging, and enhancing" the OCoP (Reeves & Hedberg, 2003, pp. 60-61). Through methods of "progressive refinement" (Collins, 1999, p. 2), the OCoP will be revised continually throughout the formative evaluation until the bugs are worked out.

Personal interview participants and research contacts in Bulgaria will be asked to register for the discussion forums. Professor Tzvetkova-Arsova will forward relevant forum discussions to the researcher. They will be translated either by Tzvetkova-Arsova or another contact from Bulgaria. An ongoing review of discussion forum contents will provide valuable information about how the OCoP is used.

Experts in special education and web design will be asked to review the alpha version of the OCoP and complete questionnaires. Web design experts will be asked complete a heuristic evaluation—an inspection guided by a set of usability principles—as described by Barnum (2002) and Nielsen & Mack (1994). Webpage hit statistics will be tracked to help determine which areas of the OCoP are useful and which should be reworked. Such statistics are available through open-source software provided by the web-hosting service. The usability test will be conducted with a group of students from the University of Wollongong. The test will be more formal than the one conducted during the needs assessment. Users will be videotaped as they work through a series of tasks such as sending a discussion forum message. They will be asked to think aloud as they work. Five participants will be selected on an availability basis. According to Barnum (2002) and Nielsen & Mack (1994), five participants is enough to receive productive feedback.

Toward the end of the formative evaluation, an anonymous web-based survey will be created and linked to the website. The survey will be made quantifiable using Likert-scale questions such as, "This website seems logical to me?" and "Using the website for the first time is easy?" (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). A follow-up evaluation of special education knowledge will be administered via e-mail to the participants interviewed during the needs assessment. Telephone interviews will be conducted with research partners and website moderators in Bulgaria. The beta website will be posted to the Internet at the end of the formative evaluation. Design principles will be proposed in keeping with the design-based research approach.

Outcomes

The main goal of this study is to design, implement, and evaluate a groundbreaking and useful education product to assist with special education in Bulgaria. In addition, the study seeks to incorporate the theoretical requirements for successful CoPs; address Bulgarian cultural contexts regarding computers, the Internet, and special education; report on the feasibility of implementing Internet-based instruction in Bulgaria; connect special education research with practice; and define new design principles based on research results.

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