Learners and Faculty Creative Partnerships through Building a Virtual Community: Their Experiences toward Sharing Knowledge Online

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Abstract: In the 21st century, there is a new paradigms shift from traditional distance education approaches to network-based elearning understandings in universities and colleges. Therefore, economy (cost effectiveness and efficiency), technology (communication technologies) and equity (gender, accessibility, minority, language, religion etc.) are vital issues in distance education systems. Moreover, how faculty-learners equally share knowledge for educational purposes and how they can enhance their partnerships are major concerns in online learning at higher education. The main purpose of this study is to define and analyze the online experiences of faculty and learners toward sharing knowledge in open and distance learning milieus to create a virtual community in Colleges. Therefore, it will be investigated their positive and negative experiences in virtual educational milieus.

Introduction

Educational reforms of great significance have emerged in sharing knowledge online, and having profound effects on thinking and practices of faculty and learners interested in knowing more about the pedagogical background of these reforms (Abbey, 2000). The development of knowledge sharing online to create a virtual community in learning comes as a surprise to faculty and learners, because knowledge sharing in traditional learning milieus is uniformly rigid, strict and authoritarian. Therefore, an effect on improving the quality of online knowledge sharing to create a virtual community must have instituted fundamentals changes in learning (Moore & Tait, 2002).

While educational reform is gradually evolving in colleges and universities to new knowledge sharing approach online must initiating by faculty-leaners partnerships in learning. Therefore, it is based on the sound principles of educational theory and human development, we have to describe and understand the experiences toward sharing knowledge online to enhance faculty-learners partnerships through creating a virtual community (Thomas & Carswell, 2000). The reform must be concerned with the development of the whole partnership within the online learning milieu.

Purposes

The use and integration of information technologies in the open and distance education milieus of Colleges have been enormously growing for nearly two decades. This paradigm shift forces enhancing faculty-learners partnerships in higher education to collaborate with each other and to create a virtual community. It suggested ways of enhancing virtual collaborations through the use of themes and helps faculty and learners enlarge the options for sharing knowledge online. Therefore, the roles and responsibilities of faculty and learners in online collaborations must be clearly defined. Moreover, faculty and learners must understand how to turn virtual community into a real-life workshop where online knowledge sharing flourish to find practical suggestions for evaluation of faculty and learners partnerships through creating a virtual community.

The main purpose of this study, therefore, is to define and analyze the experiences of virtual faculty and learners toward sharing knowledge online to create a virtual community in Colleges. In this study, also, it will be investigated their positive and negative experiences in virtual educational milieus. Therefore, this is a research for online designers and learners interested in moving toward a more open and flexible and distributed approach how to suggestions and advice presented in a clear conceptual framework. Besides, it is equally valuable for online administrators interested in educational improvement and reform. Besides, the researcher gives detailed descriptions of online knowledge sharing, and shows how the online participations to share knowledge lead to a



closer relationship between faculty and learners. This shows faculty and learners how they can collaborate with each other, and how they can use their natural curiosity to guide them toward maximum knowledge sharing.

Finally, before entering the study, the researcher tends to analyze the research data inductively rather than to prove or disprove a hypothesis. Therefore, the main focuses in this study are: 1) to investigate and understand the insider's views toward sharing knowledge in different courses, and 2) to expound on this study participants' perspectives and interpretations rather than researcher imposed categories.

Theoretical Framework

Over the past few years, online distance education has been explosively popular with faculty and learners at Universities . As a result, Colleges are dealing with the enormous growth of the electronic learning environments, which has encouraged their Universities to open its door to create virtual milieus where professors and learners can communicate with each other electronically. With the rapid growth and increasing accessibility of the Web, many professors are now offering various types of online-based courses, ranging from partially online to completely online, to their learners. Synchronous and/or asynchronous learning milieus have been used to enhance many classes in their institutions.

Most of Colleges have invested heavily in WebCT as a virtual learning environment. Since WebCT has provided new opportunities to use the Web as a medium for education, many courses and programs in Universities have been rapidly changing to keep pace with the use of WebCT, which is a unique educational delivery system. The use of WebCT, however, as a delivery medium in the academic setting in these organizations has started to change the roles and learning strategies of faculty and learners. Unlike traditional education, WebCT as an educational tool has started to make faculty and learners take responsibility for their own learning at their own pace in their own space. Professors are embracing WebCT into their curriculum both for online education and to supplement traditional education by incorporating new ways of accessing, delivering, exchanging and sharing information with their learners whose experiences with a virtual community have become an important tool for addressing problems.

WebCT also has the potential to support the real-world experiences of faculty and learners (Bastiaens & Martens, 2000). With the use of WebCT as a supplement to on-campus face-to-face classes as well as its use to support fully online classes, there is no doubt that the classroom is no longer bound by time and space. Besides, WebCT provides increasing numbers of convenient and relatively inexpensive learning environments. Faculty learners partnerships through creating a virtual community by sharing knowledge online have become an important tool for addressing problems, which may arise in implementing online tools such as WebCT. Essentially, WebCT has brought about new ways for faculty-learners partnerships to allow access, delivery, sharing and exchanging knowledge to each other. To deliver educational knowledge via WebCT, therefore, the faculty and learners together must carefully redesign and revolutionize their new roles around online learning, methods, techniques and strategies in an interactive and collaborative virtual community. Their experiences toward WebCT need to be more clearly defined, examined and/or analyzed to integrate and implement this technology into the curriculum efficiently.

This study has taken a grounded theory approach to allow the researcher to explore and discover the facultylearner partnerships through creating a virtual community, and their experiences toward sharing knowledge online. Therefore, there is a twofold consideration in this study: First, increasingly, professors in Colleges are beginning to offer graduate level teacher education courses online. Secondly, online knowledge sharing opportunities to create a virtual community and faculty and learners partnerships represent relatively new phenomena at the same Universities . As a result, there is a lack of theoretical or empirical research on this topic. Before entering the study, therefore, the researcher tends to analyze the research data inductively rather than to prove or disprove a hypothesis. The main focus in this study is: 1) to investigate and understand the insider's experiences toward sharing knowledge online through creating a virtual community, and 2) to expound on this study participants' perspectives and interpretations rather than researcher imposed categories.

Methods

This is an ongoing action research, which utilizes both qualitative and quantitative data to provide detailed information to the researcher for analysis. The combination of this method helps the researcher to generate new perspectives and stimulate new directions in data analysis. The combination of the methodologies is to



strengthen this study design and to provide triangulation. Therefore, the researcher overcomes the intrinsic bias that can come from single methods.

This case, also, is chosen for a couple reasons: First, this study is exploratory in order to allow insights to emerge from a recursive data analysis process. The research variables are highly complex and extensive. Additionally, the research data are very dependent on context and needs to be collected in its natural environment without controls and manipulations. Second, this case will examine the phenomena in depth in its natural context by focusing on a specific case.

Participants and Setting

The purpose of this study is to investigate the faculty and learners partnership through online knowledge sharing to create a virtual community. During 2003-2004 School Year in the Spring Semester, the researcher established an online community via a messenger group, and made an announcement about her research by posting a message via online professional listservs to find participants voluntarily involving this research. The participants' Colleges have been offering classes online (in various degrees, i.e. enhanced or completely online) approximately five years. The faculty and learners in these higher education institutions were chosen for three major reasons: First, the current faculty have been strongly interested in using the Web as an educational tool to make possible communication between regular class sessions. Second, the most of course curriculums in these Colleges have included both computer-based learning activities into classroom and Web-based learning activities. Finally, the majority of learners in this study have been considering the idea of taking courses completely online in the near future.

In this study, there are two groups as participants: 1) Online faculty, and 2) online learners: Seven females (5 experienced, 2 new users) and nine males (6 experienced, 3 new users) online faculty were participants in this study. Totally sixteen online faculty from six different programs (Curriculum & Instruction, and Special Education, Marketing and Management, Social Sciences and Humanities) in three different Colleges (Education, Business and Art & Sciences) from two different countries voluntarily participate in this study. Fifty online learners from six different programs (Curriculum & Instruction, and Special Education, Marketing and Management, Social Sciences and Humanities) in three different Colleges (Education, Marketing and Management, Social Sciences and Humanities) in three different Colleges (Education, Business and Art & Sciences) from two different countries were identified for the surveys and interviews according to their willingness to participate the study. Besides, twenty-three of these online learners (16 experienced, 7 new users) were male and twenty seven of the participants (21 experienced, 6 new users) were female in this research. All online faculty and learners in this study answered the online survey, and also participated the online individual and focus group interviews. In addition, they took weekly logs about their online experiences at the open and distance learning milieus during the school-year.

Data Sources

an online faculty-learner partnerships assessment survey distributed to all online faculty and online learners,
individual semi-constructed online interviews lasted nearly 30 minutes each and conducted with all online faculty and learners,
semi-constructed focus group online interviews with all online faculty and learners,
the bulletin board messages from online faculty and learners,
individual weekly logs of all online faculty and learners,

Data Collection

The participants in this study were asked individually to read and sign the informed consents form, which described the research in detail. After signing the informed consent forms, the researcher handed out a survey to the research participants. This survey has three main sections: 1) the ten demographic questions; 2) a five-point Likert type scale with twenty questions and 3) five open-ended questions.

The main instrument of data collection in this research was the interview protocols. Therefore, the open-ended interview questions are designed to collect and analyze data on the faculty and learners partnership to create a virtual community. Each interview's questions were developed and modified according to investigating the focus of this study. Online individual and focus group interviews were held with all participants online. Each interview lasted approximately 30 minutes in length. Although all interviews were logged, the researcher wrote notes that summarized the major points of each ses sion, and also she has been following a careful data management process to ensure high-quality accessible data and documentation of data collected. For these reasons, the



researcher regularly recorded and systematically stored qualitative data on computers and videocassettes. The data has been indexed for easy and consistent retrieval.

Researcher daily kept all bulletin board messages from online faculty and learners during the Spring Semester of the 2003-2004 School Year. On the bulletin board, online faculty and learners shared their experiences and feelings about creating an online community by sharing knowledge online. Moreover, all participants were asked to keep individual weekly logs during the Semester. Finally, researcher observed all online activities of the participants on the messenger during the same period. Therefore, researcher gathered information in detail about participant online experiences in their courses and daily lives.

Data Analysis and Discussion

The analysis of the faculty and learners partnerships through online knowledge sharing on the different subject areas is ongoing process, that began at the end of the Fall 2003 semester and will continue through the final written report. The data analysis process in this study is analytic and recursive to inform further decisions on data being collected. It also is restructured, flexible and open to the discussions with the stakeholders and reviews of related literature.

During the data analysis procedure, the researchers briefly followed these steps given in a logical order: 1) transcribed each online individual and focus group interview, observation and individual log, and 2) identified patterns and themes. After transcribing the logs and identifying patterns and themes, the researchers triangulated the qualitative data and reported the results in descriptive and narrative form together. Content analysis of this study indicated that faculty and learners have both positive and negative experiences toward online knowledge sharing to create a virtual community.

Findings and Discussions

This study shows that the key points of online knowledge sharing are to train not only faculty but also learners on online learning, and to provide them with reliable and regular technical, pedagogical and administrative supports. In addition, encouraging and motivating faculty and learners to take advantages of online knowledge sharing to create a virtual community is also a necessary measure to insure effective utilization of the online learning environment (Jonassen, 2000). However, online knowledge sharing in their Colleges is relatively a recent phenomenon, which requires more research. Creating more virtual communities, however, is gradually shifting, so it is necessary to keep pace with improvements and reforms on learning online.

Positive Experiences toward Sharing Knowledge Online

The participants in this study learned best when they developed positive experiences toward sharing knowledge online to create a virtual community. These positive experiences motivated them to solve a problem, accomplish a task, set specific goals, work with others and informational resources during the knowledge sharing process (Wiburg & Butler, 2002). However, it took time for these participants to adopt a positive experience towards living in a virtual community. Finally, the faculty and learners focused on three crucial points to participate in an online milieu: 1) online openness, flexibility and convenience, 2) access the course online, and 3) virtual collaboration,

Online Openness. One example of an online knowledge sharing, which used a systematic approach to deliver content, was a cross cultural communication course. Online learners could connect their knowledge and practice and had more in depth re flection in the construction of knowledge when participating with faculty learning online. Although they were diverse and had different learning styles, learners could collaborate with each other online as well. Therefore, they also used learner-centered and reflective knowledge construction and previous experiences as learning strategies. While the main issue is whether online courses delivered via WebCT are as good as traditional, in-classroom education, the online faculty and learners said, *"The important think is the course content to share knowledge online to create a virtual community"*. Virtual partnerships, therefore, must create a collaborative context for educational communications. The content and structure strategies of online courses can affect online knowledge sharing to build participation between faculty and learns. Thus, there are many challenges to the implementation of a virtual community in higher education. For that reason, posting information for a WebCT course a key way for faculty to organize and disseminate online knowledge and resources to share with their learners, who view course related knowledge on the Web. Not only can faculty post



their course syllabus, schedules, assignments, etc, but also these knowledge sources can be easily updated for learners to access equally. To deliver knowledge, professors wished to share their experiences with other professors who have developed and taught WebCT based courses. Therefore, the needs and interests of the learners can be valuable to faculty when designing a collaborative course on WebCT (Resta, 2002).

Flexibility and Convenience. Nearly all participants in this study especially emphasized that they enjoyed working within the virtual environment because of enhanced flexibility, convenient course scheduling, and around-the-clock access to course related knowledge. They, also, stated that they could work anywhere at their own pace and WebCT provided them access to a vast amount of the Internet-based knowledge and resources including text, audio, graphics, and video. Potentially, a WebCT course becomes a huge data collection and immensely powerful research tool. This virtual community to share knowledge, therefore, provided a linkage between faculty and learners on the Web. Thus, learners in a virtual setting explore d their own interests and needs, and become active participants in their own learning by supporting learner-control and self-directed activities. Besides, online knowledge sharing played an important role in offering knowledge-based rich contents to learners that online collaborations required a stable network and enough bandwidth to create a virtual community.

Access the Course Online. All online learners highlighted that they could find useful knowledge about the course work in their virtual community. Although all participants in this study indicated that they enjoyed reading about the postings, assignments and course contents, these participants pointed out that they did not regularly accessed WebCT to get online course information throughout the semester, because some of them had not a computer at home and/or a fast Internet connection. However, not only did learners post their assignments to engage in discussions, but also they submitted their works to an online audience where they were able to share and exchange their ideas with faculty and other learners in their virtual community. Additionally, both faculty and learners highlighted that the socio-cultural activities and links provided faculty and learners with more insightful knowledge and a friendly environment to them. Although WebCT supports online synchronous and asynchronous educational activities, most WebCT based courses in the College rely primarily on asynchronous communication allowed learners to contribute when it was convenient and encouraged them to analyze and reflect on their opinions and ideas. Therefore, asynchronous WebCT based activities could eliminate direct lecture transmissions and also require faculty to develop different ways of supporting, evaluating and engaging learners to knowledge sharing online toward creating a virtual community.

Virtual Collaboration. WebCT has become an alternative medium for delivering educational information by addressing a variety of learning styles in their Colleges. Online karners highlighted that online knowledge sharing was an open system, which fostered more learners control and supports more self-directed learning settings. They, however, were really frustrated because some of their online pals did not realize what it took to be a successful online learner and they did not want to responsibility for their learning. Most of the learners became involved in the online class participation after enrolling the course. These learners also brought different levels of skills and confidence to their WebCT site. They indicated that the more mature learners were self-directed and willing to take responsibility for their learning. While online faculty controlled learner access to files on WebCT, they knew the degree to which learners interacted with other learners online and monitored their online collaborative learning through interaction with faculty and learners. According the learners in the College, using WebCT to share knowledge online must have included an online course syllabus that gave detailed information about the course and its activities to them the related online resources and their URL addresses. The learners, moreover, not only faculty but also they could have provided course materials to create a virtual community together.

Negative Experiences toward Sharing Knowledge Online

Collaborative online knowledge sharing is a process that emphasizes group or cooperative efforts among faculty, learners and resources (Bonk, & King, 1998). Virtual partnerships, therefore, must cover active participations and interactions. Besides, WebCT must organize and structures online knowledge sharing them with fewer time and space limitations. WebCT also must encourage and engage faculty and learns to work together on learning activities. However, promoting and maximizing group work and collaborative learning on WebCT is not easy. It is difficult to identify social presence, authentic tasks and cognitive strategies such as taking ownership of a task whose cognitive challenges are construction and sharing of deas. This virtual community must enable faculty and learners to continue work together on knowledge sharing (Wilson, 2001).



Although many faculty and learners believed that forms of online communications were a superior means of interacting with each other, there were very few learners who regularly schedule WebCT chat rooms as a means of communicating with their faculty. Finally, there were four main barriers for the faculty and learners in this study to share knowledge online to create a virtual community: 1) technological problems, 2) limited knowledge sharing online, 3) overwhelmed course work and 4) digital divide. The lack of accessibility to the online course created negative reflections toward virtual learning milieus.

Technological Problems. Faculty and learners highlighted that they could remotely collaborate with each other via WebCT email and bulletin board communications. The previous experiences and knowledge about computers and its related technologies of faculty and learners could affect their enthusiasm to share knowledge online. They did point out that computer technology was rapidly changing in distance educational settings and the lack of knowledge, skills and technical support with computer technology and its applications, therefore, represented unpleasant and anxious experiences leading to difficulties in mastering appropriate skills. Technical problems, lack of systematic support and other problems experienced online typically alienate both faculty and learners, which ultimately caused online activities to become drastically reduced. The faculty and learners did state that they often felt disadvantaged when lacking updated knowledge. As a result, they need routine professional development and training as well as technical support to help them share knowledge online. On the other hand, the faculty and learners stressed that their roles to create a virtual community had been changing dramatically, thus, it was a key point to provide excellent training and technical support for them to participate online regularly and effectively.

Limited Knowledge Sharing Online. There were many comments that specifically addressed the lack of collaboration in online learning. When faculty and learners communicated with each other on a virtual community, they were not able to reflect on their experiences. Interviewed faculty and learners indicated that they did not have enough knowledge about online knowledge sharing and their changing roles in creating a virtual community. The participants in this study indicated that a majority of faculty and learners in their Colleges when lacking knowledge and experience with online environments tend to generate a lack of confidence when communicating online. Besides, they implied that uncertainty created curiosity, anxiety, and conflict in them who had low comfort levels with sharing knowledge online. As a result, the participants were less eager to participate in online partnerships. The majority of them preferred face-to-face class interactions. They also pointed out that their age, gender, personality, and cultural backgrounds highly affected their participations and contributions in a virtual community. The faculty and learners, besides, understood that their role in sharing knowledge online had been radically and dramatically changing and becoming more collaborative and less instructional. However, the major problem was that most of learners in a virtual community did not understand their responsibility to be active contributors of learning, and that the faculty were to be a facilitator and/or a mentor. Therefore, not only must learners be trained in how to instigate and contribute as online participants on WebCT, but also they must acquire good online knowledge sharing skills and strategies before creating a virtual community. Online knowledge sharing could provide well-designed learning settings in which learners represented and shared knowledge with faculty to participate with each other. Interviewed learners indicated that many of them did not have enough information about online knowledge sharing and their changing roles in electronic learning settings. Thus, they did not successfully nor actively interact with faculty and other learners. Also, many of them stated that they had to learn and improve their skills and knowledge to share knowledge online.

Overwhelmed Course Work. Though deadlines for tasks and process were given to learners; the real problem for faculty was an overload of online messages. By the end of the second week, faculty received many postings from their learners that were off the subject and as a result they could not promptly answer them or clarify their comments online. The majority of the participants in this study felt more time was spent on building a virtual community than in regular classrooms. All of faculty and learners in this study pointed out that they often times felt overloaded with information in their online classes and that a virtual community required more work. Interviewed members of the learners, however, indicated that a majority of them in the College when lacking knowledge and experience with creating a virtual community tend to generate a lack of confidence when communicating online and starting to ask various questions to their faculty. As a result, overwhelmed faculty could not participants in this study emphasized that a virtual community could be helpful in achieving vital educational goals, but they suggested that face-to-face participations could be highly crucial for them in order to promote effective social partnerships between them.

Digital Divide. The faculty and learners in this study stated that not only did knowledge sharing online allow partnerships anywhere any time, but also it supported to create a high-level interactive virtual community. A



virtual community could also provide more flexible and sophisticated learning community by extending educational opportunities beyond face-to-face class meetings and create the multiple perspectives of online partnerships as well as collegial interaction online knowledge sharing. The problem at this point was that each online learner, even the faculty, did not have similar kinds of Internet connections to share knowledge online. Besides, some learners in this study did not have a computer at home while others, who own ed a computer, did not have an Internet connection and/or had a very slow dial-up link. Therefore, learners felt isolated and disoriented when there was no face-to-face contacts with faculty and other learners. Moreover, they suggested that preventing the Digital Divide was the only key to share knowledge to create a virtual community. In short, the equal chance to share knowledge must be provided for learners to participate faculty online. Also, learners must be accustomed to adjusting themselves to the non-linear nature of online knowledge sharing. In face-toface classroom interactions, learners can generally stop faculty at any time to ask questions. However, online differs considerably in that faculty cannot be as quickly able to answers learner questions because of a lack of technological equipment. As a result, more sequential approaches to online partnerships must be used to avoid miscommunication, which delays knowledge sharing online. Thus, the majority of learners stated that they preferred to share knowledge with a virtual community by focusing on a linear and/or single discussion topics. The majority of learners, interviewed, prefer face-to-face class interactions, and they pointed out that the age, gender, personality and cultural backgrounds of them highly affected their partnerships with faculty and other learners to build a virtual community. In addition, the learning, communicating and writing skills of not only learners but also faculty could be major barriers to share knowledge online.

Knowledge sharing online in academic settings is increasing rapidly and has become a vital issue studied. An essential step in creating a virtual community perfectly in higher education is starting with an explicit definition of the changing roles and responsibilities of faculty and learners in virtual milieus. Sharing knowledge online can lead higher education to adapt changing roles, needs, interests and concerns. The overall learning atmospheres in these Colleges are highly academic and professional. However, lack of online learning experiences and computing skills might affect online faculty-learners partnership to create a virtual community. The challenge facing them is to improve knowledge sharing online, and to restructure faculty-learners partnerships through knowledge sharing for creating a virtual community. The delivery of knowledge via this environment, therefore, requires training faculty and learners in ways that maximize and allow them to further adapt the educational strategies of online partnerships.

Results and Conclusions

This study shows that the key points of knowledge sharing to create a virtual community are to offer online learning techniques and to provide faculty and learners with reliable and regular technical, pedagogical and administrative supports. In addition, encouraging and motivating faculty and learners to take advantages of knowledge sharing online is also a necessary measure to insure effective utilization to create a virtual community (Wills & Becht, 1997). Besides, **n** important step in sharing knowledge online in higher education is starting with explicit definitions of the roles and responsibilities of online faculty and learners in virtual milieus. Moreover, they must be trained how to instigate and contribute as online participants in a virtual community to acquire good online learning skills and knowledge before taking an online course.

This study shows that online partnerships encourages faculty and learners think and develop their ideas before entering their explanations on discussion topics. Unlike face-to-face classes, the participants mentioned that an effective social context with nonverbal cues (such as; body language, mimics, gestures, etc.) associated with face-to-face discussions were missing in online interaction and communication, but this was not an important barrier for them, especially, after two weeks, they could easily communicate with each other on the messenger group by using emotional icons. Learners in a virtual community, moreover, tended to focus on the contents of a message rather than who posted it rather than to improve their critical thinking skills to create a sufficient partnerships. Another disadvantage of knowledge sharing online was the loss of visual clues during creating a virtual community that could be problematic in asynchronous and/or synchronous knowledge sharing. Although email and electronic bulletin board postings were the most common knowledge sharing tool in this study, using email and bulletin board had pros and cons: Unlike face to-face collaborations, these electronic communications did not require participants to respond promptly. Online partnerships between faculty and learners in this study seem to be relatively more concise, so that online postings often became more thoughtful and creative dialogues. To take advantage of the benefits of virtual collaboration, faculty and learners, however, had to improve their ability to write and read online. Therefore, knowledge sharing online can solve some partnership problems to create a virtual community.



Finally, the overall partnership atmosphere in the College is highly academic and professional. Nevertheless, lack of online knowledge sharing experiences and computing skills affect faculty and learners experiences toward sharing knowledge online. Therefore, the major challenge facing faculty and learners is learning how to restructure their communication styles to collaborate each other to be active participants.

Educational Importance of the Study

This study allows the researcher to explore and discover the faculty and learners reflections toward online knowledge sharing to create a virtual community for two reasons: First, increasingly academic institutions in higher education are beginning to offer graduate level education courses online. Secondly, faculty and learners experiences through online knowledge sharing are relatively new phenomena (Berg, 2000). Their reflections, therefore, toward online partnerships need to be more clearly defined, examined and/or analyzed to integrate and implement the cutting-edge technologies to create a virtual community.

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