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Online learning management systems (LMS) and sense of community: A pre-service practicum perspective

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Abstract: This paper examines the impact of the implementation of an online learning management system (LMS) on pre-service teachers during their major pre-service practicum. The LMS enabled students to remain connected to peers, professors, and supervisors while new relationships were formed with in-school personnel such as mentor teachers, principals, and students. The quantitative data analysis revealed that pre-service teachers perceived a higher sense of community when it included pre-service teachers only than when it included teaching faculty and part-time practicum supervisors. The online LMS was identified as the best predictor of a sense of community among pre-service teachers, when compared to other variables, and not a significant predictor when community included part-time practicum supervisors. The paper concludes with an examination of the perspectives of provincial Ministries of Education and Teachers Federations in relation to the role and evaluation of educational technology initiatives.

Résumé: Cet article examine l’impact de l’implantation d’une plateforme eLearning (LMS) sur de futurs enseignants en stage. La plateforme a permis aux étudiants de rester en contact avec leurs pairs, leur professeurs et leurs superviseurs, alors que de nouvelles relations se formaient avec la collectivité de l’école les accueillant pour leur stage (mentor, directeur d’école et élèves). L’analyse des données quantitatives a révélé que les futurs enseignants percevaient un meilleur esprit communautaire quand seuls les futurs enseignants en

faisaient partie par opposition à une communauté composée des futurs enseignants, des professeurs de leur programme et les superviseurs à temps partiel de leur stage. La plateforme LMS a été identifiée comme le meilleur prédicteur de l'esprit communautaire chez les futurs enseignants par comparaison avec d'autres variables, et un prédicteur non significatif quand la communauté incluait les superviseurs de stage. L'article se termine sur un examen des perspectives des ministères provinciaux de l'éducation et des fédérations d'enseignants en relation avec le rôle et l'évaluation des initiatives en technologie éducative.

Introduction

In order for community-building among pre-service teachers, their professors, and their supervisors to be considered important in the teacher education process, and thus a subject worthy of examination, it must be seen as contributing to effective outcomes of teacher education programs. To situate this study, then, within the larger field of teacher education, a sense of community among pre-service teachers, their professors, and their faculty supervisors may be seen as countering in-school bureaucratic socialization pressures faced by pre-service teachers during their practicum experiences. Within this context, it is important to explore the concept of "sense of community" more thoroughly. First, though, it may be helpful to look a little more closely at the impact of bureaucratic socialization pressures.

Hoy (2001) and others have indicated that pre-service teachers entering the school for practicum experience must deal with bureaucratic socialization pressures. Such socialization appears to be more predictive of the classroom learning environments that beginning teachers will create than either their previously stated beliefs about education or theoretical approaches to the classroom developed at the university (Hoy, 2001; Lunenburg, 1986; Rideout, 2006b). This socialization pattern has been associated with diminishing frequency of communication with peers, professors, and supervisors as the practicum proceeds (Huffman, Holifield, & Holifield, 2003), while at the same time, the influence of mentor teachers and other in-school personnel tends to increase.

Theoretical Framework

Social impact theory (Latané, 1981) may account for the shift towards more custodial learning environments. This theory suggests that a subject's behaviour tends to become like the behaviour of a group of people who are important to the subject and with whom there is frequent interaction. In practicum situations, pre-service teachers may, for instance, find themselves becoming more teacher-centered, like their more experienced mentor teachers, and less likely to implement constructivist and student-centered methodologies emphasized in their teacher education programs (Hoy, 2001).

Social impact may be negated when pre-service teachers are enabled to retain a reflective, authentic, constructivist, and student-centred approach in the classroom. A community enhancing online Learning Management System (LMS) which facilitates frequent contact with a community of peers, mentors, and advisors may be seen as supporting such reflective, cognitive dissonance-valuing (Korthagen, Loughran, & Russell, 2006) responses among pre-service teachers.

Purpose of the Study

Sense of community may mitigate the bureaucratic socialization that pre-service teachers face. The purpose of this paper is to examine the qualities and characteristics of sense of community in a teacher preparation program, especially as enhanced through online LMS technology. Future research may determine the longer term impact of sense of community on program outcomes, however, such an examination is not a purpose of this study.

Access during the practicum to a community of supportive peers, mentors, and advisors may be facilitated through the use of an online LMS. The implementation of an LMS could potentially be associated with a shift in the typical patterns of communication that may occur during a practicum. For instance, it is commonly understood that when pre-service teachers embark on their practicum experiences, their contact with at-the-university personnel, as well as classmates, will decrease, while their contact with in-school personnel, and in particular, with supervising teachers, will increase. If such "bureaucratic socialization" engendering conditions are to be replaced by a cognitive dissonance-valuing reflective response, as facilitated by sense of community, an accurate assessment of pre-service teachers' sense of community including who they perceive as part of that community and how the LMS mediates that sense of community is meaningful in this context.

Researchers (Bentley, Brisebois, Caisse et al., 2004; Zlotnik, 2000), Ministries of Education (Alberta: Alberta's Commission on Learning, 2003; British Colombia: Key Components of ICTI, 2005), and teacher federations (Alberta Teachers' Association: Technology and Education, 2004; British Colombia Teachers' Federation: BCTF Response, 1997) have indicated the importance of increased involvement of teachers in determining and assessing the role of IT in education. Consonant with this theme, the Alberta Ministry of Education (Alberta Learning) has developed a policy framework within which educational researchers are encouraged to examine appropriate applications of technology in teacher education programs. These objectives are clarified in Alberta's Commission on Learning (ACOL) (2003) recommendations. Recommendations 13 (establishment of learning communities), 65 (application and professional development of technology in teacher education programs), and 67 (funding of hardware, software, support, and training) are clear in this regard. Recommendation 68 ("Regularly assess the effectiveness of new technology and applications", [ACOL, 2003, p. 111]) encourages a critical approach to the role and value of technology as an educational tool. A critical evaluation of the enhancement of community during a pre-service teacher practicum via an online LMS is consistent with these objectives.

Bearing in mind the importance placed on the creation of community, the research findings reported in this paper arise from the following two research questions:

- Do pre-service teachers who use an online LMS to facilitate communication perceive a sense of community during the major practicum component of a teacher education program, and if so, with whom?
- Does the use of an online LMS contribute significantly to pre-service teachers' perception of a sense of community?

The formation and maintenance of a sense of community, as well as factors associated with this process were examined using a quantitative data gathering method and statistical manipulations such as ANOVAs and multiple regression analyses.

Literature Review

A review of the literature includes definitions and qualities of online community, teacher education settings within which LMSs may be most effective, and the potential ameliorating role of online community in relation to bureaucratic socialization of pre-service teachers. The first area to be addressed is “sense of community” and “community” definitions and qualities.

Community is defined by Bellah, Madsen, Sullivan, Swidler, and Tipton (1985), in their book Habits of the Heart as follows:

A community is a group of people who are socially interdependent, who participate together in discussion and decision making, and who share certain practices that both define the community and are nurtured by it. Such a community is not quickly formed. It almost always has a history and is also a community of memory, defined in part by its past and its memory of the past. (p.333)

In their examination of sense of community in a blended learning environment, Rovoi and Jordan (2004) relied on McMillan and Chavis’s (1986) definition of a sense of community as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p.9).

Rovoi (2002) suggests that four essential dimensions must be present for a classroom of students, whether physical or virtual, to become a community. The four dimensions are spirit, trust, interaction, and common expectations. Spirit “denotes recognition of membership in a community and the feelings of friendship, cohesion, and bonding that develop among learners as they enjoy one another and look forward to time spent together” (p.4). Trust is “the feeling that community members can be trusted and represents a willingness to rely on other members of the community in whom one has confidence” (p.4). Learner interaction can occur around assigned learning tasks as well as through socio-emotional-driven interaction that, in distance education, often takes place by means of the exchange of empathetic messages and self-disclosure. Finally, common expectations of significant learning occur when a “community of practice” develops around the sharing of purposeful, patterned activity.

Edens (2000) reported that in a study of approximately 85 pre-service teachers a typical face-to-face interaction saw only a handful of students, those who were comfortable in speaking out in a large class setting, commenting on practicum issues such as inattentive students. On the other hand, the same group logged several hundred online discussion group interactions. In the online setting, as opposed to the face-to-face setting, pre-service teachers were “beginning to function as a professional community, sharing ideas, negotiating substantive issues, and expressing concerns with others who had common interests and goals” (Edens, p. 20).

Brown (2002) reported on the process through which community formed in computer-mediated asynchronous distance learning classes. The first stage was making friends online. The second stage was community conferment (acceptance) which occurred when students were part of a long, thoughtful, threaded discussion on a subject of importance after which participants felt both personal satisfaction and kinship. The third stage, camaraderie, was achieved after long-term or intense association with others involving personal communication.

Chapman, Ramondt, and Smiley (2005) identified elements in online conversations that differentiate a learning community from a group of individuals who simply engage in online information exchange. The identified elements of a learning community include informality, familiarity, honesty, openness, heart, passion, dialogue, rapport, empathy, trust, authenticity, disclosure, humour, and diverse opinions. Developing an online

community with these characteristics takes time and requires support from professional, experienced online-learning mentors.

Such definitions of community and reports of online community-forming behaviours point to the importance of community as a real or virtual

place

where members, with a sense of security and support, can move towards open reflection and evaluation of their responses to practicum situations. The focus of the present study, consonant with such themes, is the role that the online LMS plays in facilitating such a sense of community, and how this sense of community is strengthened or weakened by the presence in the community of various groups of stakeholders.

The second part of this literature review examines the types of teacher education settings in which online LMS technology may be appropriate as a tool for community building. Ngwenya, Annand, and Wang's (2004) conclusions concerning online LMSs indicate that cohort-based pre-service programs may be particularly suited to this kind of learning approach. They reported that the purpose of such online programs is to replicate desirable features and activities derived from classroom-based learning contexts. These features include the ability of instructors and learners to communicate openly and collaboratively, and to determine the appropriate delicate balance between the needs, values, and perspectives of both parties. Ngwenya et al. point to these capacities as particularly strong and promising features of interactive electronic communicative technologies. They indicate that group knowledge building is facilitated when students are given access to other cohort members' submissions, build on this knowledge to create new ideas, and submit these for evaluation and further knowledge sharing.

Rourke and Anderson (2002) indicate that from a practicum perspective, online discussion of pre-service teachers' new information and experiences can be an excellent integrative activity for supporting their daily practicum discoveries. This pedagogical rationale for online asynchronous discussion may be best understood from a constructivist perspective. Constructivists argue that knowledge is not so much discovered or transmitted intact from one person to another, as it is created or constructed by individuals attempting to bring meaning and coherence to new information and to integrate this knowledge with prior experience. A constructivist learning environment may be supported by LMSs that facilitate such approaches to learning.

Rovoi and Jordan (2004) examined the effectiveness of three course formats in relation to the development of a sense of community. They used a causal-comparative design to determine whether the mean differences in the sense of community measured at the end of traditional, blended, and fully online courses were larger than expected by chance. A MANOVA revealed that the participants in the blended course scored significantly higher on the connectedness post-test than either participants in the traditional course, $p < .05$, or the online course, $p < .001$. The participants in the blended course also scored significantly higher on learning than those of the online course, $p < .01$, after adjustment based on pre-test results. The blended course consisted of face-to-face and asynchronous online components. Students resided in the same geographical area. Assignments emphasized practical application, authentic tasks, collaborative action research, and group projects, and contained approximately 14 face-to-face hours in a 16 week semester

Rovoi and Jordan's (2004) research strongly suggests that, while it may be possible to develop strong communities in which deep learning occurs entirely online, it is much more likely that such communities will

form if there have been significant face-to-face encounters amongst the participants prior to the online learning experience. Community is enhanced even further if such face-to-face contact can be periodically reinforced during the learning period. That is, blended courses produce a stronger sense of community among students than either traditional or fully online courses.

The third part of this literature review is an examination of bureaucratic socialization stresses faced by pre-service teachers during practica (Hoy & Rees, 1977), and the potential role of online LMSs in facilitating a sense of community during this time. According to Babiuk, Mweti, and Yoon (2004), pre-service teachers may operate in isolation from other pre-service teachers. They report that they do not sense that they are members of a community of learners.

Latané ’s (1981) social impact theory, which suggests that a person’s actions are most strongly influenced by the group of individuals with whom they are in closest contact (based on number in the influencing group, proximity to the group, and frequency of interaction), provides a supporting rationale for the use of an online LMS with regard to sense of community. Online discussion and interaction with faculty advisors and colleagues may support pre-service teachers in responding authentically to potential conflict with supervising teachers. For example, “custodial” practicum expectations may be placed on pre-service teachers (Hoy, 2001) who hold a well thought out constructivist view of education. Such expectations may conflict with beliefs of the pre-service teacher (Dewitt, 1999). During this particularly crucial time (in the absence of supporting community), pre-service teachers may believe that in order to meet the more custodial expectations of the supervising teachers, they must trade the world of university and theory for a more pragmatic approach to education (Kagan, 1992; Korthagen et al., 2006). Socialization pressures threaten to overpower personal philosophies of education (Huffman et al., 2003; Rideout, 2006a). In the longer term, there may be significant negative consequences to such personal conflicts. Without opportunity to act on their beliefs, teachers leave the profession in droves (NEA, 2002), often as the result of illness and stress associated with inauthentic practice (Wiley, 2000).

Online LMSs can contribute to sense of community in other ways. Rovoi (2002) suggested that the difference in course completion rates may be a function of the perceived sense of community amongst participants, and that students in LMS learning environments might have a stronger sense of community. In their study of learner participation in two sections of an online course in a Midwestern US university, Vonderwell and Zachariah (2005) found that effective online learning required interdependence for a shared understanding of learning goals in a learning community. They also identified the benefit of monitoring student participation and patterns of participation closely, and suggested that this role can help instructors identify student needs and scaffold learning accordingly.

Procedure and Participants

In order to complete the major practice teaching experience (practicum) in the final semester of their two-year after-degree teacher education program, each pre-service teacher in a cohort of 34 in an Alberta elementary teacher education program was assigned to an elementary school classroom. Each school was part of either a public or Catholic school board in or near an Alberta city. Each pre-service teacher worked with a leading mentor teacher, and in some cases visited classrooms of other teachers. Students were informed at the beginning of the twelve-week practicum that in addition to practicum teaching responsibilities, supporting tasks and communication with colleagues and faculty supervisors would be facilitated via a hybrid format,

consisting of face-to-face and online LMS-facilitated interactions. The face-to-face meetings were held bi-weekly on Wednesday afternoons. During these sessions, students met as a full group to share practicum teaching experiences, including successes, and in break-out groups to discuss particularly challenging items with group members and their faculty advisor. Especially in the break-out groups, participants offered moral support and alternative approach suggestions to colleagues who were experiencing particular in-the-classroom challenges. Students participated in approximately 12 face-to-face hours in this manner with colleagues and faculty advisors during the twelve-week practicum. Additionally, each student met face-to-face individually with his or her faculty supervisor for approximately 30 minutes following each of four classroom observation visits by the faculty supervisor.

The online component consisted of two asynchronous discussion forums, in which minimum student participation levels were defined and mandated. The first was an all participants forum (based on questions posted by the weekly faculty supervisor host). In order to facilitate the second task, each student was identified as part of a small group comprising a faculty supervisor and his or her supervisees. In this forum, students posted entries twice-weekly to their teaching journals. These entries were read and responded to by the group members, including the group faculty supervisor. Additionally, there was a social forum and a news and announcements virtual bulletin board. Students spent approximately four hours weekly on LMS tasks. They resided in the same geographical area, and were known to each other since they had spent the preceding three semesters together in a cohort based teacher education program.

Pre-service teachers were invited at the end of the practicum to share feedback concerning their experiences in relation to the LMS initiative. They were advised that their participation in the research was voluntary and that their responses would be anonymous. Data were collected via an electronic questionnaire immediately following a regular class period during the practicum-concluding seminar week. All 34 students voluntarily participated. Participants ranged in age from 22 to 32. Twenty-seven were female and seven were male.

Instrument

A researcher constructed survey questionnaire was used to collect the data for this study (see Appendix A). The responses to the Likert-type items could range from 1 (strongly disagree) to 5 (strongly agree). A N/A (not applicable) option was also provided for each question. The sense of community referred to in item one (“The practicum as a whole resulted in the formation and maintenance of a sense of community among students”) and other questionnaire items is consistent with Rovoi’s (2002) “essential dimensions” of community, which are spirit, trust, interaction, and common expectations. This understanding of community was consonant with understandings of community held by the researchers and participants and was affirmed throughout the practicum.

Data were collected based on the pre-service teachers’ experiences during the practicum in relation to formation and maintenance of a sense of community among themselves, among themselves and (university) teaching faculty supervisors, and among themselves and part-time (non-teaching) faculty supervisors. Data were also collected in relation to variables that may have contributed to the sense of community in each of these three configurations of community. These variables arose from a survey of faculty, who were asked to identify factors that were most likely to shape pre-service teachers’ perception of a sense of community. The variables identified by faculty were EDIT (an acronym for EDucational Information Technology, in the form of Moodle, the LMS used by the participants in this study), Wednesday face-to-face seminar sessions, other

face-to-face meetings with peers, other face-to-face interactions with the pre-service teacher's faculty supervisor, and practicum teaching. In each of the items in the questionnaire, students were also given the opportunity to identify other factors that may have played a role in the formation of their sense of community. None were identified.

Limitations

In order to address the second research question (Does the use of an online LMS contribute significantly to pre-service teachers' perception of a sense of community?) it would have been useful to access baseline data collected in previous years concerning sense of community when there was no online LMS available to students. Unfortunately, such baseline data did not exist. As a result, this study focussed on the impact of the LMS as compared to other factors in contributing to a sense of community among participants. It was not possible to provide a comparative analysis with regard to an increase in sense of community year over year. This issue is addressed further in the Data Analysis section.

Additionally, several limitations are generally associated with the use of Likert scale measures (Ambrose, Clement, Philipp, & Chauvot, 2004). First, respondents may interpret words in Likert scale items in different ways. Perhaps the most suspect phrasing in this regard appears in the items containing the wording " The practicum as a whole resulted in the formation and maintenance of a sense of community" in relation to the term "sense of community". Although attempts were made to ensure that participants were aware of the meaning of sense of community in this context, it is acknowledged that the term community is loosely defined in terms of either professional or learning communities (Rovoi & Jordan, 2004). Second, Likert-type scales may not allow for respondents to identify the importance of the items to which they are asked to respond. Consequently, they may be asked to rate items that are unimportant to them. Third, Likert items are often decontextualized, so that individual respondents may create differing temporal or spatial points of reference for each item.

Care was taken to minimize the potential effect of such limitations in this questionnaire. Firstly, each respondent participated in many conversations throughout the preceding semester about the degree to which sense of community existed. The use of this terminology in this context was consistent with Rovoi's (2002) "essential elements" of community. Secondly, the actual purpose of this questionnaire was to ask respondents to prioritize the importance of five potential predictive variables in relation to the creation of sense of community. Finally, each item referred to a clearly defined temporal/spatial situation (the major practicum).

Data Analysis
Do pre-service teachers who use an online LMS to facilitate communication perceive a sense of community during the major practicum component of a teacher education program, and if so, with whom?

In order to address the first research question, variables indicating the perception by pre-service teachers of the presence of community were constructed, using the transform and compute functions in SPSS. These variables facilitated the identification of a mean rating given by participants concerning the formation and maintenance of a sense of community among practicum students, among students and teaching faculty, and among students and part-time faculty supervisors. In each case, the ratings were given on a five-point Likert-type scale. Since there were no archival data available with which to compare the data arising from these variables, it was unclear whether when compared to previous years, the perception of a sense of community was higher or lower. Based on an aggregate of the three, it seems reasonable, however, to conclude that this data did indicate

the presence of a robust sense of community, (M = 4.32, SD = .57).

Since the development of a more articulated understanding of the sense of community was foundational to this study, it was important to further examine who students perceived to be included in this community. To accomplish this, a one-way ANOVA was performed, which indicated that students perceived a higher level of community among themselves (M = 4.68, SD = .48) than when community was interpreted in its most inclusive format (M = 4.32, SD = .57),

t

(33) = 4.38,

p

< .001. When community included pre-service teachers and teaching faculty (M = 4.44, SD = .86), there was no significant difference from the inclusive configuration of community,

t

(33) = .82,

p

> .05. When community included pre-service teachers and part-time faculty supervisors (M = 4.08, SD = .95), there was no significant difference from the inclusive configuration of community,

t

(33) = -1.26,

p

> .05. While there was only a small, but statistically significant, difference between the means of the "pre-service teacher only" and "most inclusive format" configurations of community, it is important to note this difference, particularly in light of the predictors of sense of community that were associated with each. This information is presented below.

Does the use of an online LMS contribute significantly to pre-service teachers' perception of a sense of community?

In order to address the second research question, a series of multiple regression analyses were conducted, using the forward data analysis method. The forward method was used in order to identify a model containing variables that were most predictive of the score variance concerning pre-service teachers' perception of a sense of community in each of its three configurations (pre-service teachers; pre-service teachers and teaching faculty; pre-service teachers and part-time faculty supervisors). In each multiple regression analysis, the dependent variable was the sense of community scores. The independent variables were "EDIT", "Wednesday face-to-face seminar sessions", "other face-to-face meetings with peers", "interactions with my faculty supervisor", and "practicum teaching."

The first multiple regression analysis examined community in its first configuration. The independent variables identified above were entered into the regression function of SPSS, with "formation and maintenance of a

sense of community among pre-service teachers" as the dependent variable. Using this method, all independent variables except EDIT were excluded from the most predictive model. That is, the model most predictive of the variance in "formation and maintenance of community (pre-service teachers)" scores contained only the EDIT variable ($t = 2.99$, $p < .01$). The model was significant, $R 2 = 21.8$, $F(1, 32) = 8.93$, $p < .01$. The model accounted for 21.8% of the variance.

Because it was important to establish whether or not the relationship between EDIT and sense of community among pre-service teachers was positive or negative, a Pearson Product Moment Correlation Coefficient was computed for the sense of community among pre-service teachers and EDIT. There was a moderately strong positive correlation, $r = .48$, $p < .01$. The positive direction of this correlation indicates that participants who ranked EDIT as a positive influence also tended to give a high ranking to "sense of community."

The second multiple regression analysis examined community in its second configuration. The independent variables remained the same as in the preceding procedure, with "formation and maintenance of a sense of community among pre-service teachers and teaching faculty" as the dependent variable. Using this method, "Wednesday face-to-face seminar sessions" and "interactions with my faculty supervisor" were excluded from the most predictive model, leaving "practicum teaching" ($t = 3.56$, $p < .001$), "other face-to-face meetings with peers" ($t = 3.87$, $p <.001$), and "EDIT" ($t = -2.13$, $p < .05$) as the variables comprising this model. The model was significant, $R 2 = .770$, $F(3, 30) = 33.41$, $p < .001$. The model accounted for 77% of the variance.

The third multiple regression analysis examined community in its third configuration. The same five independent variables were entered into the regression function of SPSS, with "formation and maintenance of a sense of community among pre-service teachers and part-time faculty supervisors" as the dependent variable. Using this method, "EDIT", "Wednesday face-to-face seminar sessions", and "practicum teaching" were excluded from the most predictive model, leaving "interactions with my faculty supervisor" ($t = 4.53$, $p < .001$) and "other face-to-face meetings with peers" ($t = 3.30$, $p < .01$) as the variables comprising this model. The model was significant $R 2 = .586$, $F(2, 31) = 21.91$, $p < .001$. The model accounted for 58.6% of the variance.

Discussion

The analysis of survey data examined the degree to which a sense of community was perceived to be present by the pre-service teachers. It also identified the configuration within which the strongest sense of community existed. Finally, it identified variables most predictive of each of these configurations of community.

In relation to the first research question, pre-service teachers perceived that there was "formation and maintenance of a sense of community" within the inclusive community of practicum students, teaching faculty, and part-time faculty supervisors. When disaggregated into the three configurations of community, the data indicated that the score for "formation and maintenance of a sense of community among pre-service teachers" configuration of community was significantly higher than the score for the inclusive community.

This finding may be explained in several ways, and does not seem particularly surprising. These pre-service teachers had spent the preceding four semesters (Fall 2004, Winter 2005, Fall 2006, Winter 2006) as a cohort, with one exception (one student had completed the first three semesters of the program with a cohort from the preceding year). As a result, it appeared that these participants had developed a fairly strong support network among themselves, sharing weekend and "after exam" type of activities, living accommodations, car-pooling, and social banter in the LMS "strictly socializing" forum. Consistent with these examples of community

behaviour, it therefore is not surprising that pre-service teachers would affirm a sense of community in their positive response to the "sense of community among pre-service teachers" questionnaire item, unless this sense of community had been disrupted by the new input (EDIT).

Another explanation for the higher sense of community among pre-service teachers when compared to the other configurations of community may be connected to their awareness of the challenges that some of the faculty supervisors were facing with regards to the new LMS technology. In the semester immediately preceding this data collection, the LMS initiative had been introduced via two orientation and training sessions. It was clearly stated in these sessions that the purpose of the initiative was to facilitate the formation and maintenance of a sense of community. It was readily apparent in these sessions that pre-service teachers tended to be more facile and less threatened by this new technology, when compared to the other groups, based on offhand comments and frequency of questions voiced by the other groups during the sessions, and perceived proficiency with the program at the end of the sessions.

The new LMS technology appeared to be easily accessible to the "native to the digital age" user, generally born after 1962, and less accessible to "immigrants to the digital age" users, generally born in 1962 or earlier (Sweet, 2000). Web-based technology may have been perceived as a tool for enhancement of community by a majority of the "native" group, but at least initially as an inhibitor by a majority of the "immigrant" group. In this study, all pre-service teachers would have been "native" and all faculty "immigrant". Based on their observations during the teaching and orientation sessions, individuals in the pre-service teacher group may have perceived that for at least some faculty, participation in an electronically mediated community might require them to develop new knowledge, skill and attitudes in order to fulfil different expectations than those traditionally associated with practicum supervision. This perception on the part of the pre-service teachers may have lowered their expectations in relation to the richness or multidimensionality of online LMS community that would include faculty and supervisors. During a group face-to-face debriefing session attended by the pre-service teacher, faculty, and supervisors at the end of the practicum, some part-time faculty advisors, in fact, acknowledged that they did not believe that sense of community would be enhanced by the LMS, and indicated that they had directed their students to communicate in more traditional ways.

In relation to the second research question, certain variables were seen to be predictive of a perception of a high degree of community in each of its configurations. The model that was most predictive of "pre-service teacher only" community contained only one variable, EDIT. The degree of variance accounted for, approximately 22% with a positive correlation between EDIT and pre-service teachers' community, is not particularly high, but EDIT was the only predictive variable. As a result, it must be considered that pre-service teachers saw EDIT at least as a useful addition in relation to their own sense of community.

EDIT was a new factor, introduced immediately before the last semester in the bachelor of education program, with the explicit aim of "facilitat[ing] … a sense of community between pre-service teachers and other stakeholders". EDIT may have contributed to the significantly higher sense of community in its "pre-service teachers only" iteration, since such an intervention would be more likely viewed as "with it", progressivist, and helpful by exclusively "native" users.

It may be of concern to some that the significance of EDIT may be exaggerated as a result of the Hawthorne effect. In fact, any response to a "glamorous" intervention in an experimental situation might be seen in this manner. It is worthy of note in this situation, however, that (a) the EDIT intervention evoked a positive (as opposed to negative) response in relation to creation of sense of community, (b) the data supporting this

finding was collected at the end of the intervention, approximately four months after participants were introduced to it (participants communicated daily via the LMS during the practicum, so the novelty may have worn off by the end of the practicum), and (c) a number of the participants continued to participate in the LMS-facilitated community well beyond the end of the practicum, when the novelty value would no longer be seen as significant.

The model that was most predictive of the "pre-service teachers and full time faculty" community included "practicum teaching", "other face-to-face meetings with peers", and "EDIT", and appeared to account for 77% of the variance regarding student perceptions concerning community in this configuration. In attempting to account for the inclusion of these particular variables in the predictive model, it seems reasonable to consider that students may have taken a functional or outcomes oriented view (Chapman et al., 2005) of Rovoi's (2002) four dimensions when community included full-time teaching faculty. This iteration of community may have held meaning and purpose for the pre-service teachers, particularly in relation to the dimensions of interaction and common expectations, as it facilitated the functional goal of progress towards learning to teach. Community, with a "learning to teach" focus, was best facilitated by practice in the practicum classroom, personal support available through face-to-face chats with peers, and task oriented discussions with faculty advisors and peers via EDIT. The excluded variables may also tell a story: "Wednesday face-to-face seminar sessions" and "interactions with my faculty supervisor" (in a non-EDIT medium) may have been excluded because pre-service teachers did not see them as offering anything significantly different from what was already facilitated by EDIT and the other included variables.

The model that was most predictive of the "pre-service teachers and part-time faculty supervisors" community included "interaction with faculty supervisors" and "other face-to-face meetings with peers", and appeared to account for almost 59% of the variance in students' perceptions of community within this iteration. Notably, EDIT was excluded. The inclusion of these particular variables may be reflective of the pre-service teachers' perceptions of this group of faculty advisors' lack of facility with digital technology. The majority of this group of faculty advisors were retired school teachers or administrators, with whom students may have observed or experienced a direct or indirect resistance to or awkwardness with EDIT. As a result, in this case pre-service teachers may have identified non-EDIT interactions as more aligned with part-time practicum supervisors' practices and views regarding effective community building. The literature identifies this tendency for pre-service teachers to accommodate the preferred approaches of their practicum supervisors (Sergiovanni & Starratt, 1998; Shively & Poetter, 2002). Additionally, in this setting, as was the case in community that involved full-time teaching faculty, face-to-face chats with peers remained important.

Implications for Teacher Education Programs

First, based on the data analysis and discussion above, pre-service teachers appear to be more comfortable with electronic technology than the other groups identified in the configurations of community. This is supported by the rudimentary pattern evident from an examination of the data. The more remote any group included in a particular configuration of community is likely to be from using digital technology on a regular basis, the less likely an online LMS is to be perceived by the pre-service teachers as contributing to the formation of community. For example, when community involved only pre-service teachers, the online LMS was the only predictive variable with regards to the formation and maintenance of a sense of community. When community included pre-service teachers and teaching faculty (whom the pre-service teachers may have seen using digital

technology in a variety of instructional and communicative scenarios during the previous three semester), the perception of a sense of community was predicted by the online LMS and two other variables. Finally, when community included pre-service teachers and part-time faculty supervisors, the perception of a sense of community was predicted by two other face-to-face variables, but not the online LMS.

A second implication of the study is that when there is a formalized community-building web-based LMS in place, and additional opportunities to interact face-to-face informally, such as “interaction with faculty supervisor” and “other face-to-face meetings with peers”, a formalized debriefing session may be viewed by pre-service teachers as redundant. In the context of this study, pre-service teachers were required to attend a bi-weekly two-hour session and encouraged to share their successes and challenges with the whole cohort. The agendas of these sessions were determined primarily by the department head. The sessions were collegial in nature, and best characterized as an opportunity for open, relatively frank self-assessments of recent classroom experiences. Whole group interactions among pre-service teachers, faculty, and supervisors were exclusively positive. There were occasionally emotionally charged accounts of struggles in the classroom, followed by supportive responses from colleagues.

A number of students did express towards the end of the practicum that this was not the best forum for such interaction, and that there was some redundancy between this forum and the various forums available via the LMS. As a result pre-service teachers with access to an online LMS may not see this type of session serving as useful a function as it has been perceived by faculty to serve with previous cohorts. This “Wednesday face-to-face seminar sessions” variable did not emerge as a predictor of community in any of its configurations.

Third, while not explicitly examined in this study, it seems that perhaps two views of community (in a different sense than the community configurations delineated for this study) may exist, and that these types of community may be closely related to whether or not the community is mediated by digital technology. Particular characteristics of these types of community may be facilitative of particular educational visions, missions, and goals espoused by different educational jurisdictions. For example, the kind of online community within which some pre-service teachers tend to be more comfortable may not include some of the personal touches that are afforded in the face-to-face kinds of interactions traditionally associated with community building.

In this regard, teacher federations in Canada have clearly stated their concerns about IT policy that displaces the social development of the student. According to the Saskatchewan Teachers’ Federation, “A key challenge is to ensure that technological applications affirm rather than diminish the human, social dimension that must always remain at the heart of teaching and learning” (Bentley et al., 2004, p. 3). In an article on the Alberta Teachers’ Association web site, McFarlane (2004) argues that the current goals for educational technology shift the focus from social and intellectual educational goals to economic goals. Further research in this area may lead to a clearer understanding of which characteristics of community are seen as most important in relation to effective education.

Fourth, many will argue that pre-service teachers are better prepared to facilitate classroom learning as they acquire community building IT skills. Early on, the Manitoba Ministry of Education recognized the changing role of teachers: “In an information technology-enhanced classroom, the teacher’s role is that of a facilitator, rather than an expert” (Manitoba Education and Training, 1998, p. 10). In support of the British Colombia Ministry of Education position concerning the evolving communal learning nature of the classroom and the role of the teacher, Fryatt and Morgan (2002) reported that “students and teacher collaborate and learn

together” and teachers “become facilitators, designers, learners, and researchers” (p. 10). One might argue that as teachers become more proficient with a constructivist pedagogy enabled during their teacher education program via such technologies as online LMS, they are more likely to engender such constructivist computer enabled facility in their students.

In conclusion, while this research may have answered some questions concerning the creation of community within teacher preparation programs, it also raises additional questions which future research initiatives may address. What shifts are occurring in the kind of knowledge, skills, and attitudes that pre-service teachers are developing? How do they align with the requirements of the educational jurisdiction within which the pre-service teacher may work? Who should support pre-service teachers during their practicum experiences? Can the goals of the teacher preparation program be reached when practicum supervisors are not perceived by pre-service teachers to be computer savvy? What is lost or gained when the supervision pattern is changed?

Longitudinal studies may yield some understanding regarding the degree to which beginning teachers’ participation in a variety of stakeholder communities shapes their classroom learning environments around constructivist or custodial methodologies. Additionally, future research is needed to determine whether teacher satisfaction and retention have been improved as a result of the strengthening of a sense of community among pre-service teachers, teaching faculty and supervisors. Inherent in this community building research will be the issue of whether or not teacher preparation programs are seen as addressing the issues of bureaucratic socialization and authentic practice. Educational leaders will need to confront such questions if teacher education programs are to effectively prepare technologically and pedagogically proficient teachers for their digitally native students in the classrooms of tomorrow.

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Appendix A

EDUCATION XXX PRACTICUM QUESTIONNAIRE

Below is a selection of desired outcomes for the EDUC XXX Practicum. Please indicate your agreement or disagreement that each outcome was achieved. After each outcome is a listing of practicum components that may have contributed to the development of each outcome. Please select the number that best describes your sense of the degree of contribution made by each component. (ED-IT refers to the Internet Technology component of the practicum using MOODLE as the platform.)

Rating Guide: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree, N/A = Not Applicable

1. The practicum as a whole resulted in the formation and maintenance of a sense of community among EDUC XXX students.

1	2	3	4	5	N/A
O	O	O	O	O	O

2. The following components contributed to my response:

	1	2	3	4	5	N/A
ED-IT	O	O	O	O	O	O
Wednesday face-to-face seminar sessions	O	O	O	O	O	O
Other face-to-face meetings with peers	O	O	O	O	O	O
Interactions with my Faculty Supervisor	O	O	O	O	O	O
Practicum teaching	O	O	O	O	O	O

3. The practicum as a whole resulted in the formation and maintenance of a sense of community between students and teaching faculty.

1	2	3	4	5	N/A
O	O	O	O	O	O

4. The following components contributed to my response:

	1	2	3	4	5	N/A
ED-IT	O	O	O	O	O	O
Wednesday face-to-face seminar sessions	O	O	O	O	O	O
Other face-to-face meetings with peers	O	O	O	O	O	O
Interactions with my Faculty Supervisor	O	O	O	O	O	O
Practicum teaching	O	O	O	O	O	O

5. The practicum resulted in the formation and maintenance of a sense of community between students and part-time Faculty Supervisors.

1	2	3	4	5	N/A
O	O	O	O	O	O

6. The following components contributed to my response:

	1	2	3	4	5	N/A
ED-IT	O	O	O	O	O	O
Wednesday face-to-face seminar sessions	O	O	O	O	O	O
Other face-to-face meetings with peers	O	O	O	O	O	O
Interactions with my Faculty Supervisor	O	O	O	O	O	O
Practicum teaching	O	O	O	O	O	O

Submit Survey

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