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EXPLORING ONLINE LEARNING COMMUNITY DEVELOPMENT: THE RELATIVE IMPORTANCE OF INFLUENCING FACTORS

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Abstract

This paper describes an investigation into the development of learners' sense of community using a model describing community development through presage, process and product stages. The study sought to explore the relative importance of design factors and to describe the relative influence of factors between the presage and process stages in the model. The study was facilitated through an investigation into the practices of a professional working in the field who was committed to the principles of collaborative learning and the development of a learning community. The findings reveal a strong influence of presage factors many of which had the prospect to limit community development among learners. The results suggest the need for teachers to be attentive to the presage factors in the delivery of online courses and programs and to implement courses of action to overcome limitations which are evident in the presage stage.

Keywords

learning communities, presage factors, design factors

Introduction

There is strong support for the supposition that the social phenomenon of community may be put to good use in the support of online learning (Bonk & Wisner, 2000; Hill & Raven, 2000; Hiltz, 1994; Palloff & Pratt, 1999) and it has been suggested that empirical research be undertaken to identify how these communities may be developed (Bonk & Wisner, 2000; Palloff & Pratt, 1999).

Learning Community Development

In a series of studies investigating the student experience of community in the online environment, Brook and Oliver (2002; 2003 a; 2003b) define community as 'a sense that members have a belonging, members matter to one another and to the group and a shared faith that member's needs will be met through their commitment to be together' (McMillan & Chavis, 1986p. 9). Brook & Oliver (2002) adopt a four dimensional framework incorporating membership, influence, fulfilment of need and shared emotional connection (McMillan & Chavis, 1986) to describe sense of community and the Sense of Community Index to measure these elements (Chavis, Hogge, McMillan, & Wandersman, 1986). In an early study the

most influential factor in sense of community development in a community based web site was identified as the level of use of the site and that level of ICT expertise, access and experience bore no significant impact (Brook & Oliver, 2002). In a subsequent inquiry Brook and Oliver (2003a) argue that purpose is the binding factor in the sense of community experience and that small group work can be more influential than whole class activity. In the same study participant appreciation for the positive approach adopted by the instructor to both the learning environment and technical problems were identified with students finding frustration at delayed communication and the time required in completing group activities.

These findings, coupled with a review of contemporary literature, have led the authors to develop a design framework describing the underpinning elements in learning community development, the Learning Community Development Model (Brook & Oliver, 2003 b). The model is based on the three ‘P’ model of presage, process and product (Biggs, 1989) and represents the influencing factors and the chain of events that can lead to sense of community development. Presage factors are categorized into system, learning context and student characteristics. Process factors are categorized according to factors associated with communication including reason and context, enabling, supporting and facilitating and the framework concludes with, among other products, sense of community. (Figure 1)

While the model represents an integrated system suggesting factors influential in community development it does not indicate the relative importance of any of the factors and further research is needed to explore this. This paper describes an investigation into the link between sense of community development and the proposed design framework. The intention was to identify the relative importance of design factors, at the presage and process levels.

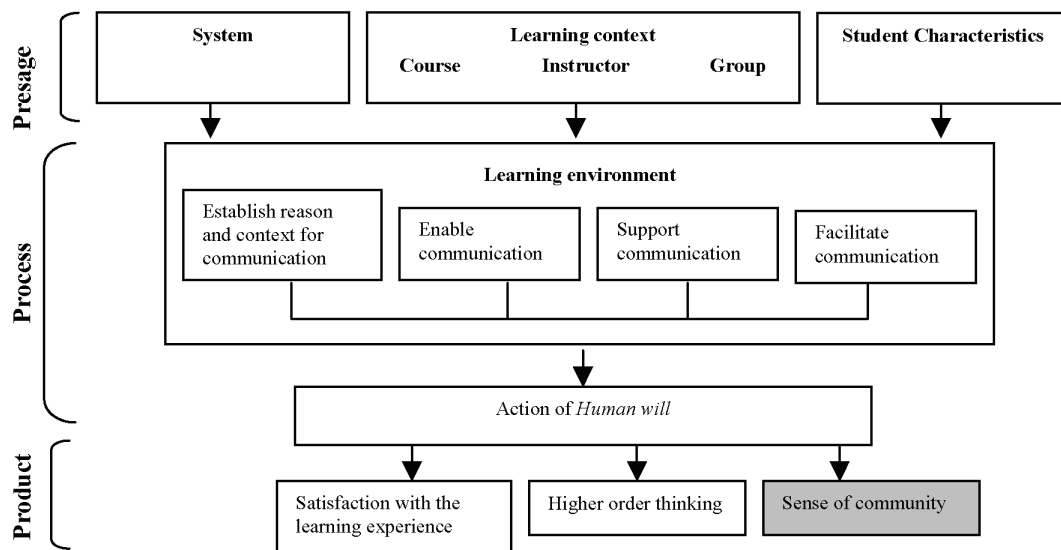


Figure 1 Learning Community Development Model (Brook and Oliver, 2003b)

Research Methodology

The purpose of this study was to explore the various impacts of the elements in the Learning Community Development Model in terms of their relative influence and contribution to learning community development. While many authors have previously explored process factors and their influence on community development, there has been scant research to date exploring relative influences of the more established elements in teaching and learning (presage) settings over which teachers have less control and influence. This study was undertaken to explore the following research questions:

1. Of what relative importance are presage and process factors in the development of sense of community?
2. In what relative ways do presage and process factors exert influence in the development of sense of community?

This study sought to engage in *inspired basic research* (Stokes, 1997) incorporating an inquiry which maintained a focus on the application of findings. This approach has been adopted to address the limitations of standard experimental design in online environments (Hiltz, 1990) and to avoid the debate over basic versus applied research (Reeves, 1999, 2000). The quest for both fundamental understanding and application of findings have been the guiding factors in the selection of both the research paradigm and methodology (Patton, 1990; Stokes, 1994, 1997). Acknowledging that qualitative and quantitative paradigms are not mutually exclusive (Patton, 1990) both paradigms were used according to needs. To ensure a direct link between the goals of the researcher and those of the practitioner the study was grounded in the actions of expert practitioners and their students.

Measuring the community experience

The data gathering for the study required a number of instruments and forms providing measures of community development. It is possible to measure the four elements of sense of community on an individual basis using the Sense of Community Index (Chavis et al., 1986), an instrument that has been shown to have validity across contexts (Chipuer & Pretty, 1999). However, the focus on the four elements alone does not account for what membership means (Hill, 1996; Sonn, Bishop, & Drew, 1999). To develop a deeper understanding of the community experience it is necessary to utilize data gathering techniques that are sensitive to the realities of context and grounded in the experiences of members (Sonn et al., 1999). This has been achieved through the inclusion of open ended questions that provide the opportunity for individuals to express what membership means to them. Further supported is gleaned through observations of what actually transpires (Patton, 1990).

Gauging Knowledge Construction

In terms of the contributions of learning communities to knowledge acquisition and learning, most methods of evaluating collaborative learning in computer conferencing stop with quantitative analysis and avoid the more challenging content analysis processes required to fully explore knowledge construction through social engagement (Mason, 1991). It is the construction of knowledge that is central to constructivism (Jonasson, Mayers, & McAleese, 1993) and not the frequency nor the patterns of communication (Gunawardena, Lowe, & Anderson, 1997). Gunawardena et al. (1997) suggest that the social construction of knowledge progresses through five sequential phases (Gunawardena et al., 1997) (Table 2). This model has been used previously to evaluate collaborative learning environments (McLoughlin & Panko, 2002). The model appeared to be a strong guide to the data collection in this study to monitor the collaborative construction of knowledge through community activities.

Five phase model
<ul style="list-style-type: none"> • sharing and comparing of information • The discovery of exploration of dissonance or inconsistency among ideas concepts or statements • the negotiation of meaning • Testing and modification of proposed synthesis or co-construction • Agreement statements and the application of newly constructed meaning

Table 1 Interactive analysis model for examining social construction of knowledge in computer conferencing (Gunawardena et al., 1997)

Data collection processes

A case study approach allowing an in-depth and focused study of a learning community in its naturally occurring environment was employed in this study (eg. Willig, 2001). Online community explorations are suited to this approach as they occur naturally and are bounded systems (Rheingold, 1993). Data collection strategies for case study research require a certain level of triangulation (Willig, 2001). For this reason a number of data collection processes were employed within an online learning class. The course

selected for the study was an online class at the university level, delivered over a twelve week semester. The instructor demonstrated a clear intention to utilize principles of collaborative learning and the development of a learning community as key instructional strategies. The course had been successfully delivered over several years and was considered an exemplar model.

Interviews were conducted with instructors to explore the forms of engagement and activity employed to promote the development of a learning community. An environment that encouraged free expression and openness was established through a semi structured approach allowing interviewees to express their own understanding (Willig, 2001). An observational strategy was employed to address the limitations of what can be learned by what people say, further insight being gleaned through observation of what actually transpires (Becker & Blanch, 1970; Patton, 1990). Observations of discussion board transcripts were planned to serve a specific research purpose, were subject to checks and controls and recorded systematically (Kiddler, 1981). Observation of what transpired in the natural setting provided a more detailed insight (Merriam, 1998; Patton, 1990; Willig, 2001). Transcripts of class discussion and discourse were analyzed on the basis of the *functionalism* paradigm focusing on the purpose and meaning associated with language use (Nunan, 1993; Schiffrin, 1994). Utterances were considered context specific signals (Lyons, 1977) and a unit of meaning may comprise a single word (Schiffrin, 1994).

A demographic questionnaire was employed to collect data on individual presage characteristics that appeared likely to impact on community development including cultural influences (Gudykunst, 1991; Triandis, 1996), communication patterns (Belenky, Clinchy, Golberger, & Tarule, 1986; Tannen, 1994, 1995) and perceptions of self as connected or separate (Gilligan, 1982). In completing the questionnaire students were asked to rate each of these factors on a five point scale from zero as not applicable to four as very high. In addition factors such as educational level, level of experience and technology skill were identified. The triangulation required to validate and support case study research (Merriam, 1998) was facilitated through the sense of community index (Chavis et al., 1986) a quantitative measurement tool.

Procedures for data analysis

The constant comparative approach described by Patton (1990) and embedded in Grounded Theory (Strauss, 1987) was utilized for data analysis. Data coding was sensitive to ‘conditions, interaction among the actors, strategies and tactics and consequences’ (Strauss, 1987 pp. 27-28). Three types of categories were anticipated, those based on SOC framework (McMillan & Chavis, 1986), those based on the proposed design framework (Brook & Oliver, 2003 b) and in vivo categories (Burns, 1996).

Findings

The findings from the data collection and analysis are shown below and have been organized using the presage and process elements from the Learning Community Development Contexts Model. The findings describe the impacts of the various components on learning community development and seek to explore the relationships and influences between presage and process.

Presage factors

a. System At the institution level the use of online technology in the support of student learning was considered a focus, a standardized LMS with extensive support were made available, however academic staff were not restricted to the use of these systems. Online instruction attracted the same workload as face to face instruction. Initial course development was funded through an internal grant. Assessment and grading policies mandated a limited number of high grades could be awarded in any given cohort. The system factors had strong prospects for supporting community development.

b. Learning context The course was designed for undergraduate students and was offered completely online. The subject matter was instructional technology with a focus on virtual schools and teaching online. The participating cohort consists of 14 students with a gender mix of 6 males and 8 females. Twenty eight percent (4) of the cohort volunteered to take part in the study representing a gender mix of

3 females and 1 male. The lack of consistency between gender representation in the cohort group and the research group suggests a phenomenon that may be of significance in the final analysis. The instructor possessed extensive experience in both developing online courses and teaching in the online environment. Professional practice demonstrated a commitment to the principles of collaborative learning. The instructor planned to employ purposeful strategies to support the development of a learning community informed by contemporary pedagogical practice and current literature. Once again there appeared to be strong contexts for community development within this element of the model.

c. Student characteristics The student cohort reflected an undergraduate level of education consisting of participants who considered themselves to be reasonably skilled in the use of online technology having participated in at least one other online course. Fifty percent of the volunteer group was participating as part time students. Additionally the cohort expressed a preference for engaging in learning activities that were highly collaborative with some independent learning suggesting a predisposition toward engaging in collaborative activity. Participants identified the pursuit of individual goals as more important than maintaining group harmony, suggesting a tendency toward perceptions of self as *separate* from others. Motivating factors for assisting others were identified as reciprocity and to see others do well. Participants identified that the opportunity to learn from others and helping others to learn were motivating factors in the decision to engage in collaborative activity. In addition receiving grades for participation was considered a highly motivating factor and the potential to reduce the workload was identified as the least motivating factor. The lack of grades awarded for participation, difficulties in communicating and competing for high grades were identified as the major inhibitors to collaborative activity. Disagreement with other group members was rated as least significant inhibitor to collaboration (Table 2). The data gathered describing the demographics of the students, their previous experiences and capabilities with ICT seemed typical of a cohort which could easily form learning communities within the prescribed curricula and again this presage factor did not appear at the outset to suggest any problems in the teaching and learning models planned for the course.

Demographic details		Total
Student status	Fulltime	2
	Parttime	2
Gender	Male	1
	Female	3
Level of education	Undergraduate	4
	Postgraduate	0
Online learning experience	First course	0
	Two courses	4
	More than two courses	0
Technical skills	Novice	0
	Reasonable skilled	4
	Highly skilled	0
Perceptions of self		Mean
Preferred online learning style	Totally independent	2
	Highly independent with some collaboration	2.25
	Highly collaborative with some independent	3
	Totally collaborative	2
Goal orientation	Achieve individual goals	3.25
	Support group harmony	2.5
Motivation for helping others	Reciprocity	2.5
	I care for others and want to see them do well	2.75
	A little of both	3.25
Motivation to collaborate	Learn form others	3.75
	Help others learn	3.75
	Reduce the workload	2.5
	Receive grades	3.5
Inhibitors to collaboration	Competing for high grades	2.25
	No grades awarded for participation	3.25
	Disagreement with group members on key points	1.75
	Difficulties in communicating	2.75

Table 2 Responses to the demographic questionnaire

Process elements

Examination of the various process elements within the context of the course was achieved through the variety of data gathering processes described earlier. The following sections detail how each of these was seen to contribute to the development of the learning communities within the cohort.

a. Reason and context for communication A primary strategy in encouraging participation in collaborative activities in this course was the allocation of thirty percent of the final grade based on participation. Criteria for assessment were;

1. Did the student make at least two contributions to the discussion?
2. Did the student make additional useful and insightful contributions?
3. What was the level of understanding and insight shown by the student? Did they contribute to the depth of understanding of others?
4. Did the student work well in smaller group work through both facilitating group activity and in cooperating to get work done?

Purposeful participation was promoted through 6 fortnightly small group activities, prescribed weekly whole class discussion and three discussion forums with *visiting experts*. These forums were intended to promote knowledge sharing, social activity and increased intellectual capital. Membership in small groups was established by the instructor and rotated through the small group activities ensuring that participants had the opportunity to work with multiple partners. Discussion board activities linked directly to the 'lived in world' and course objectives. The workload for small group activities was manageable at both the group and individual level ensuring that, in the event that small groups become dysfunctional, individuals could elect to complete the learning tasks alone. A similar strategy was implemented for small group discussion activities where individuals were encouraged to join an alternate group in the event that poor participation levels characterized their assigned group. This level of flexibility was not utilized as a strategy to resolve or avoid cognitive conflict between group members.

b. Enabling communication Communication was enabled primarily through regular meetings via asynchronous discussion boards. In addition students had access to telephone communication, face to face meetings where possible, instant messaging, e-mail, synchronous chat facilities initiated at their own volition. Use of alternative technologies was discouraged where contribution to the discussion boards was an assessable component of the course. Group work areas available through the LMS were established for small group tasks. Both small group and whole cohort activities were based on predetermined topics and students were required to engage in both. Report writing was a primary activity and a weekly schedule for communication was set and linked with the assessment schedule. Discussion board activities were a key strategy in enabling communication as was setting a weekly schedule for participation. Groups were encouraged to establish their own group procedures including roles and responsibilities and where appropriate any conflict that arose was resolved at the group level. The instructor undertook an active role in group discussion in the early stages of the course and gradually withdrew as the course progressed. Human elements were embedded in the text based environment through welcoming messages, referring to participants by name and requiring participants to post (and comment on) introductory messages.

c. Supporting communication Technical support included a *help desk* facility operated across the institution although the availability of this service was not clearly stated in course material. The instructor made a clear statement on technology requirements and expectations regarding students' ability to use required technologies. Links to downloads required for course participation were provided. A discussion board dedicated to technical problems and course issues was established, the instructor was active on this board and students were encouraged to both seek and provide peer support. Anonymity was not allowed and a clear statement was made regarding the need to respect the contributions of others. Students were made aware of the need for self-management in the online learning environment including time management and the need to take responsibility for their own learning. The instructor modeled appropriate text based communication skills engaging extensively in selected discussion boards including the social board. Observations indicated that this level of participation waned as the course progressed in line with the deliberate intention to promote self-management of the leaning experience. The instructor initiated one to one communications with students displaying low levels of participation to prompt higher levels of activity through direct support.

d. Facilitating communication The instructor employed deliberate strategies to imbue human elements into the text based environment. Strategies included a welcome message, elaborate messages modeling appropriate text based communication skills, referring to students by name and integrating rituals of community life as evidenced:

Joe (*name changed*) leans back and lets the sun warm him. He takes a long drink from his glass and smiles. "I like it here," he says. "The weather is so much better on the terrace than in my regular world."

Students were encouraged, but not compelled, to fulfil a range of roles including leader and to resolve any conflict that arose. The instructor encouraged a tone that was open, inviting and friendly and intentionally established a pace that required weekly participation. Students were actively encouraged to share knowledge and their experience to support each other's learning and were assessed on the quality of their contributions. At the same time students were made aware that university policy ensured competition for a limited number of high grades. Allocation of grades based on the quality of posts ensured that students who were actively engaged and offered high quality contributions were rewarded for their efforts while *lurkers* were not. Activities followed a sequence from safe to risky.

Product

The final analysis in the study concerned determinations of the extent of the community development that occurred during the semester and the identification of the impact of the discrete presage and process factors on this. The Sense of Community Index was administered in week 3 and 12 of the course.

Sense of community As may be expected the elements of sense of community were present at varying levels, but all were identified at a moderate to high level. The scale completed in week three of the course indicated that students identified a strong sense that their needs would be met through being together, an equally strong sense of shared emotional connection and a reasonable strong belief that bi-directional influence was possible. Not surprisingly students indicated a relatively weak sense of membership suggesting that they did not perceive themselves to be a distinct group of *us* (those that are members) separate from *them* (who are not). Not expected was the relatively high expectation that their needs would be met through their commitment to be together, that they were in a relatively strong position to influence the group and a strong belief that that they shared an emotional connection. As the students have no prior relationship with each other it is unlikely that these returns indicate a true sense of community and more likely that they reflect an expectation of what community membership will bring.

A comparison of the results from each administration suggests some interesting changes in student's sense of community experience (Table 3). Noticeable is the significant increase in students' perception of membership indicating that toward the end of the course they perceived themselves as members of a group. An increase in member's sense of influence indicates that students perceive an increased opportunity to both influence and be influenced by the group. Both the sense that needs will be met and shared emotional connection (considered the definitive element of true community) diminished slightly. This outcome continues to support the supposition that the students perceive themselves to be members of a learning community and is likely to indicate a more accurate account of students sense of community developed as a result of engaging in the planned learning environment.

Element	Mean response week 3	Mean response week 12
Reinforcement of needs	4.666	4.5
Membership	3.1	4.5
Influence	4.25	5
Shared Emotional Connection	4.666	4.333

Table 3 Sense of Community Index results

Open ended questions

Interestingly students indicated a stronger sense of community in small group opposed to whole class activity. In both rounds participants expressed a positive expectation of their membership believing that working with others would increase their learning opportunities. The following quote typifies responses;

that I am learning not only course material, but also learning about others' experiences.

When asked what encouraged them to take part, some students reflected on the location independent nature of online learning, others commented on the direct link between learning content and their profession. Several commented on the fact that they were assigned to the group and only participated in order to achieve the grades. When asked what discouraged participation students commented on the lack of participation from other members, slow response times and technical problems. The low level of instructor participation in the latter stages of the course was cited as a cause of discouragement. One student reflected on a previous online learning experience and lamented the absence of a face to face meeting in this course, believing this strategy to be instrumental in making meaningful connection with other students. One student summarized the factors that contributed to participation succinctly by stating;

fundamentally we have joined because we want to learn

Learning and the construction of knowledge

Observations of what actually happened in the learning environment, revealed an interesting trend in the nature of communication. Statements of support and agreement dominated collaborative activity from week one through nine. Some points of clarification were requested and made but communication was overwhelmingly supportive in nature. It was not until week ten that students were prepared to state and explore dissonance and inconstancy suggesting that students were not prepared to engage in risky interactions until relatively late in the course. When exploring difference of opinion students called on their own experience to support their position, offered analogies to illustrate a point of view and negotiated meaning. This behaviour appears to reflect a progression through a five phase model describing the collaborative construction of knowledge (Gunawardena et al., 1997).

Discussion

At the presage level the instructor noted the importance of institution support in the development of the online and the level of support offered to students. Although the students identified themselves to be reasonably experienced in the online learning environment they believed that technical difficulties hampered their ability to collaborate and that institution, instructor and peer support in the resolution of these difficulties were invaluable. Students also identified institution policies that restricted the number of possible high grades to be an above average inhibitor to collaboration. At the course level both the instructor and the students noted the importance of the educational level of the course and the influence this factor had on course development and the nature of participation in collaborative activities. The instructor identified student motivation for course participation and competing time commitments as key influencing factors in the development of community-oriented behaviours. This appears to be reflected in the behaviours of students who displayed low levels of participation despite being provided with one to one assistance and additional encouragement, strategies that had no noticeable impact on participation levels. There was no discernable difference in the participation of either part time or full time students. Student responses suggest a strong link between sense of community and the approach adopted by the instructor including the structure, the nature of group activities and the overall pace of the course.

At the process level students highlighted the importance of grade allocation in promoting participation. This was an interesting outcome as those who participated in the study contributed to discussion board activities at a rate five to seven times that which was required for assessment suggesting that participants contributed to discussion boards for reasons other than attaining grades. This was reflected in responses

to questions investigating promoters of collaborative activity where students identified the opportunity to learn from others and help others learn as motivating factors. It appears that the reason and context for communication is strongly promoted when students perceive direct benefits to themselves as a result of their participation. Benefits may relate to an enhanced ability to resolve problems, a tangible reward such as grades or the opportunity to engage in knowledge sharing. Interestingly, students displaying low levels of participation appeared willing to meet minimum requirements or forego the grades and other benefits, suggesting this strategy did not provide sufficient motivation to prompt participation. To some extent the communication tools used in the course were adequate but students were keen to utilize additional mediums. This suggests the need to be flexible when enabling communication allowing the use of a variety of tools. Students also expressed considerable frustration at the instructor's withdrawal from the learning environment suggesting this level of withdrawal to be a poor strategy. Interesting, observations suggest that the mutual sense of frustration, and in some cases concern, may have acted as a binding factor for sense of community. However, there was no clear positive impact on the learning experience as a result of this strategy.

Students noted that the sense of community experience was derived from small group rather than whole class activity. This preference is evidenced by high level of participation in small group activities opposed to relatively low levels in those at the whole class level. It is also interesting to note that individuals abandoned groups that were experiencing low levels of participation to join more active groups. This suggests a need to focus on small group activity in the promotion of sense of community while allowing some flexibility in group membership. The opportunity to state and resolve course related issues appeared to have a strong link to sense of community development with students actively contributing in meaningful ways as novice or expert where appropriate.

Of particular interest was the significant increase in the elements of membership and influence suggesting an increased sense of us and the potential for bi-directional influence. Also interesting was the apparent correlation between an increase sense of community and a preparedness to engage in the more challenging aspects of the collaborative construction of knowledge. This suggests that as students developed a stronger sense of community, and in particular a sense of membership and the opportunity for bi-directional influence, they were prepared to engage in activities associated with a high risk of shame.

Observations of what did not happen provide evidence of strong links between a code of conduct, perceived safety, fare trade and sense of community development. This is evidenced through equity of participation, the sharing of roles and responsibilities and the absence of destructive conflict. There was no evidence that the direct support offered to students participating at low levels influenced their level of participation. This suggests that low participation levels were related more to student characteristics such as motivation than technology difficulties.

Conclusions

The findings from this study revealed that a number of presage factors, such as competition for a limited desired resource (high grades) and large group size, limited sense of community development for many learners. The outcomes suggest that such limiting influences might be minimised if due consideration is given at the process level. Linking presage factors such as course curriculum with process factors such as reason and context for communication appear as ways to promote sense of community development. This suggests the need for teachers to give serious thought to potentially limiting presage factors when attempting to develop a learning community. However, there was no indication that student characteristics at the presage level that inhibit sense of community development, for example, motivation to participate, were influenced by process factors. The possibility of influencing student characteristics through process factors requires further investigation.

The high levels of participation in activities displayed by volunteers taking part in the study opposed to low levels by non volunteers may suggest that individuals who volunteer to take part in a study of this nature have a predisposition to seek community membership. Similarly the lack of consistency between gender representation in the cohort and volunteer groups suggests that findings may be relevant

in environment where the socialized female role is dominant. It also possible that the involvement of an observer in the learning environment has prompted a change in behaviour manifested in increased participation of those being observed.

While the single case study approach has provided the opportunity to study the development of sense of community in detail, a multi-case study approach is required if findings are to be generalized. Further study is required to identify how the absence of any of the identified factors impacts on sense of community and strategies for prompting participation from individuals who are indisposed to seek community membership. In addition it would be interesting to investigate the possibility of promoting the development of sense of community earlier in the course affording an increased opportunity for students to engage in the social construction of knowledge at a higher level for a more sustained period of time.

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