



Maintaining connections: An investigation of the factors that influence student participation in health science classes

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Abstract: *There is a growing number and diversity of students in Australian universities. A disturbingly high proportion of students adopt passive roles in structured classes, thereby forfeiting the opportunity to engage actively in the learning process. A clearer understanding of factors influencing active participation is likely to encourage re-evaluation of how the classroom setting is structured. In 2008, a questionnaire was administered on-line across the Division of Health Sciences in an Australian university. Survey items represented: self-reported participation in classes; fear of teacher and peer criticisms; peer support; family and school background; confidence; informal contact with teachers; and expectations of students' roles at university. Path analysis assessed independence and interdependence of pathways linking participation with hypothesised predictors.*

764 respondents (559 females) provided complete responses (29% response rate). Among males and females there was a relatively strong pathway linking fear of teachers, confidence and participation, with higher levels of fear predicting lower confidence and participation. In turn, students' perceptions of their role in the learning process was strongly associated with fear of teachers, indicating that undergraduate students' belief that it is inappropriate to ask questions indirectly reduces their confidence to participate through fear of teacher criticisms. A direct association was seen between students' perceptions of their role in the learning process and fear of peer criticism, suggesting that the pressure to play a passive role is reinforced by peer pressure. Students' perceptions of their role was associated with school and family background, suggesting that earlier encouragement to communicate influences students' perceived role and status at university.

These findings underscore the importance of teaching strategies that diminish students' concerns related to the perceived consequences of participation. With expanding classes and shrinking contact time, the challenge before the tertiary learning community is to foster a sense of connectedness among its members.

Introduction

The issues explored in this study arise from the growing number of students in many courses in the Health Sciences in Australian universities, and the increasingly diverse backgrounds of this population. These changes are accompanied by the challenge for teachers to maintain connectedness with the learners in their courses. The current learning environment for internal students in Health Science programs is characterised by large, densely populated lecture theatres and more intimate laboratory/tutorial settings with 15-20 students. It is within this latter context that students have a structured opportunity to interact with their peers and their teachers. However a disturbingly high proportion of students adopt passive roles in these groups (Weaver & Qi, 2005). As Tinto (1997) points out, 'involvement matters', as it facilitates more advanced forms of reasoning such as analysis, synthesis, evaluation and application (ACER, 2008). Yet less than one half of undergraduates in the recent Australasian Survey of Student Engagement reported asking questions of teachers or working with other students in class 'often' or 'very often' (ACER, 2009).

Several constraints have been identified that explain the low levels of involvement in class discussion among the majority of students. While it is well established that large class sizes allow students to easily achieve anonymity (Weaver & Qi, 2005), reasons for highly varied participation levels in smaller classes are less well understood. Factors such as teacher authority (Howard & Baird, 2000), the age and sex of the student (Howard, James & Taylor, 2002), the level of student preparation for the class (Tinto 1997; Chung, 2000) and student emotions, such as confidence and fear (Howard et al., 2002; Chung, 2000) have been shown to affect engagement within smaller groups. However the potential origins and interactions of these factors have not been extensively researched.



Weaver and Qi (2005) explored the mosaic of influences on class participation among students in a mid-western United States university. Several direct and indirect pathways to participation were reported, with fears of criticism from teachers and peers contributing strongly to the explanatory power of the statistical models. The authors urged more research be conducted to explore the nature of the tertiary classroom as a complex social organisation.

It is highly likely that the constraints tested by Weaver and Qi (2005) operate within the learning culture of Australian universities, and yet this is a largely unexplored topic. Strategies that build on the demonstrated antecedents of classroom participation are critical for ‘energising’ the classroom and capitalising more fully on the opportunities for students to interact with teachers. This study explored direct and indirect predictors of participation in Health Sciences classes in a large Australian university.

Methods

In 2006, focus groups were conducted with Health Science students to identify factors affecting participation in small classes, from their perspective. A survey instrument was developed that was based on the questionnaire of Weaver and Qi (2005) and adapted to reflect the outcomes of the initial focus groups and the local university context. This was administered on-line across the entire Division of Health Sciences between April and July, 2008. Themes represented in the survey are displayed in Table 1. Response options were ‘always’, ‘sometimes’, ‘occasionally’ and ‘never’ (coded 1-4) for questions related to participation and peer support, and ‘strongly agree’, ‘agree’, ‘neutral’, ‘disagree’ and ‘strongly disagree’ (coded 1-5) for all other items. Thematic scores were derived from sums of individual item responses. The protocol was approved by the University’s Ethics Committee.

Data analysis

Internal consistency of item responses within themes was assessed using Cronbach’s alpha (see Table 1). Path analysis (Partial Least Squares method) using PLSGraph (version 3.0) was used to analyse the independence and interdependence of hypothesised pathways linking participation with predictors (see Figure 1). Path analysis is a multivariate modelling procedure that explores associations among predictor variables as well as with the outcome variable (in this case, participation). This approach is therefore more appropriate for identifying potential intervention points than linear regression techniques, particularly where causes of behaviour are complex and inter-related. The hypothesised pathways were derived from the literature (Weaver & Qi, 2005) and the outcomes of the initial focus groups conducted in 2006. Path coefficients were significant at $t \geq 1.65$.

Theme (Cronbach α in brackets)	Examples
Participation (0.71)	I regularly ask or answer questions in class.
Inter-personal predictors	
fear of teacher (0.79)	I am afraid the lecturer/tutor will respond negatively to my questions or answers.
fear of peers	I feel peer pressure not to participate in classes.
peer support (0.51)	I regularly discuss my work with other students in class.
Intra-personal predictors	
Background (0.57)	High school did not give me the confidence to take an active role in groups.
beliefs about Uni	It is not appropriate at university to admit you don't understand.
Confidence (0.72)	My participation in class is hindered by my lack of confidence.

Table 1: Themes and example items from the survey. (*Full questionnaire with 64 items available from corresponding author)



Results

A total of 764 respondents provided complete responses (29% response rate). The majority of respondents were female (73%, $n=559$), which closely approximates the overall proportion of females (72%) in the target population. Results of the path analysis are reported in Figure 1. Path coefficients are presented for females (F) and males (M) separately. For ease of interpretation, non-significant coefficients for hypothesised paths have been omitted. Among males and females there was a relatively strong pathway linking 'fear of teacher', 'confidence' and participation, such that higher levels of fear were associated with lower confidence and participation. In turn, 'beliefs about Uni' was strongly associated with 'fear of teacher', indicating that undergraduate students' perception that it is inappropriate to ask questions indirectly reduces their confidence to participate through fear of teacher criticisms. Further, among male students there was a direct association between 'beliefs about Uni' and 'confidence'. The direct association between 'beliefs about Uni' and 'fear of peers' (see Figure 1) suggests that the pressure to play a passive role in the learning process is reinforced by peer expectations. Among males and females, 'beliefs about Uni' was associated with 'background', suggesting that experiences in the home and school influence the way tertiary students form their perceptions of their status and role. For female students, 'background' was also related directly to 'confidence'. Among males and females, there was a significant pathway linking 'peer support', 'para-participation' and participation, while for females there was a direct association between 'peer support' and participation.

Discussion

These findings support the proposal of Weaver and Qi (2005) that the social organisation of the classroom has a significant impact on the degree of student participation in class. The Path model highlights the formal and informal social structures that influence students' self-reported participation. In particular, the strongest influences were the less easily modified informal structures exerted through students' background experiences and understandings of implicit rules of engagement in class. The observation that fear of teacher criticism limited participation indirectly via confidence is consistent with other recent studies of undergraduate participation (Chung, 2000; Dallimore, Hertenstein & Platt, 2004). In the current study, fear of criticism was associated with students' beliefs about university which in turn was related to their previous experiences at school and in the home.

Evidence from this study and others (Auster & MacRone, 1994; Weaver & Qi, 2005) suggests that increasing the social connections between students and narrowing the social gap between teachers and learners might help to improve students' active participation in class. Simple "para-participation" activities such as emails or discussions with teachers before or after class help to improve participation, as do peer support activities such as discussing work with other students in class and in less formal settings. Other suggested strategies include: collaborative learning tasks such as problem-based learning strategies that require students to work together in cooperative groups; the use of learning communities where students engage in project-based tasks or cooperative critical reflection; and giving students clear guidelines as to how to provide evidence to support their own view so as to facilitate the development of their critical thinking skills (Foster et al., 2009; Tinto, 2002; Wilson & Fowler, 2005). As argued by Sim (2006, p. 506) students learn best in environments that have "low anxiety" and "low uncertainty". By clearly articulating the level of our expectations for engagement in teaching sessions and assigning students specific roles and tasks in group discussions we can help reduce their fear of 'looking stupid'. If we are to break down the social isolation commonly experienced by many of our students we should design our curriculum and courses with maximum opportunities for students to engage in meaningful ways with their peers and teaching staff (McInnis, 2001).

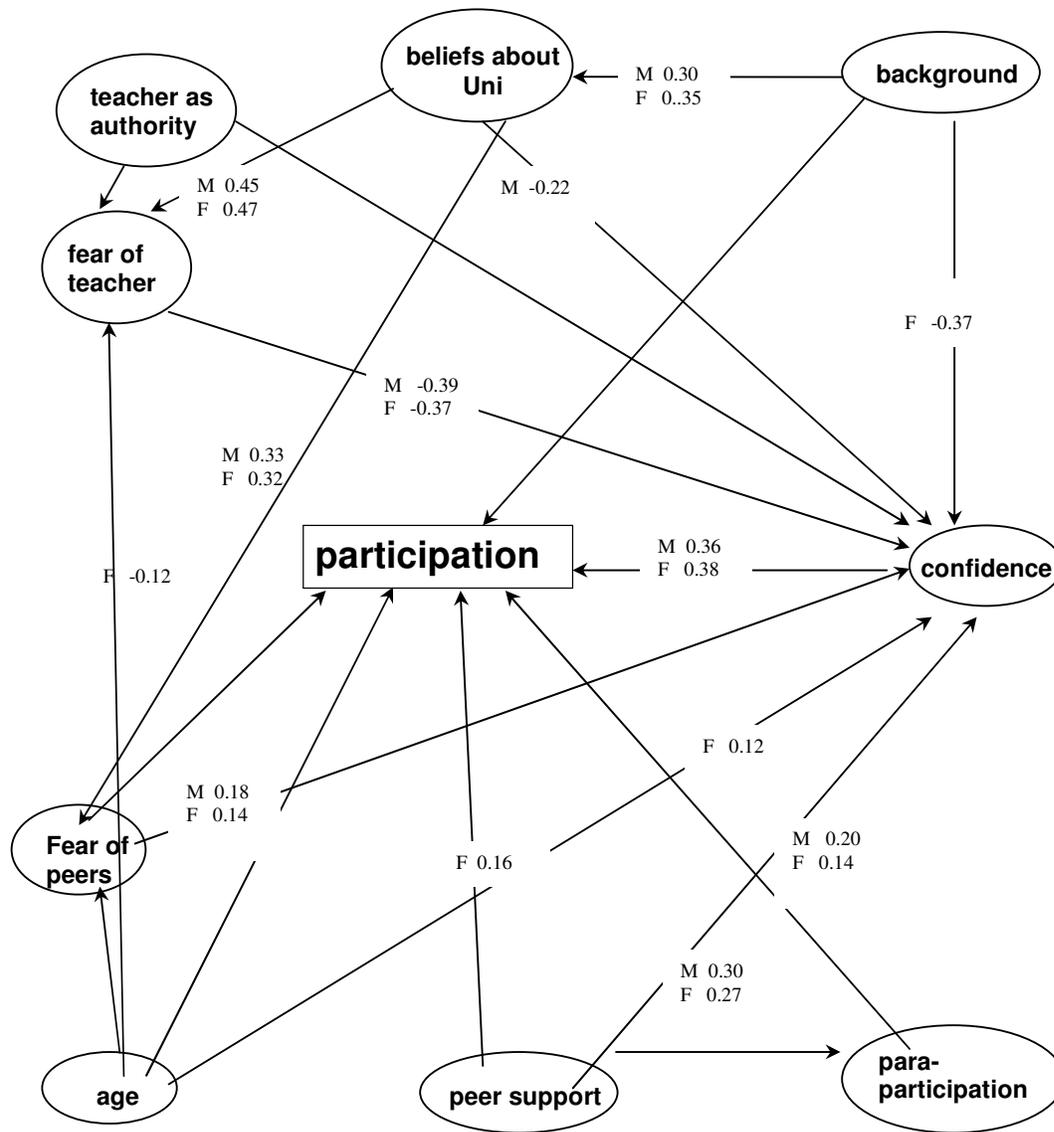


Figure 1: Path coefficients for hypothesised predictors of participation

The classroom serves as the ‘academic and social crossroad’ (Tinto, 1997), therefore if we can develop learning environments that are supportive not only of students' academic performance but also of their social engagement then it is much more likely that students will invest the time and energy needed to succeed and enjoy their university study.

There are a number of methodological limitations of this study to be acknowledged. Active participation was self-reported rather than objectively measured, and was rather narrowly defined as the frequency of asking and answering questions in class. Future research could include a validation of the students’ self-report using direct observation of classroom behaviours. The internal consistency of some predictor variables was relatively low (Cronbach $\alpha < 0.60$), thereby limiting the resolution of the analyses.

Conclusion

This project is part of an ongoing study investigating the factors that affect student participation in small group teaching environments. The results underscore the importance of diminishing students’



anxieties in the classroom (Tinto, 1997; Weaver & Qi, 2005). Collaborative pedagogies such as problem-based learning or project oriented learning tasks lead to the development of 'learning communities' (Tinto, 1997) through which the academic-social divide is narrowed, the result of which is actively engaged students. In addition, strategies such as getting to know individual students by name and formation of multicultural clusters for group work have been shown to facilitate the creation of inclusive classroom environments in which positive rapport with and between students is established (DeVita, 2000). With expanding classes and shrinking contact time, the challenge before the tertiary learning community is to foster a sense of connectedness among its members. As Greenfield (2005) reminds us, "Students don't care how much you know until they know how much you care."

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