



## Being Together: Factors that Unintentionally Undermine Motivation in Co-located Online Learning Environments

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### Abstract

This paper reports on one aspect of a larger case study that explores the nature of motivation to learn in an online distance environment. The study adopts self-determination theory (SDT) as a theoretical framework and focuses particularly on the underlying concepts of autonomy and competence. These are used to investigate ways in which certain situational factors, that fail to accommodate the specific autonomy and competence needs of co-located learners, can undermine perceptions of personal agency and efficacy. This, in turn, has a detrimental effect on self-determined types of motivation including intrinsic motivation. Results from one collaborative group of learners, situated in a co-located blended learning context, are presented here. They suggest that the differing circumstances of students need to be accommodated to foster autonomous types of motivation among learners.

**Keywords:** blended learning; distance education; e-learning; motivation; online learning; self-determination theory; problem-based learning (PBL)

### Introduction

The characteristics of independence, self-direction, and intrinsic motivation have long been associated with distance learners (Garrison, 1997; Moore, 1989). Recently, intrinsic motivation has been identified as an important characteristic of online learners (Shroff, Vogel, Coombes, & Lee, 2007; Styer, 2007). Findings from comparative studies between online and on-campus students (Huett, Kalinowski, Moller, & Huett, 2008; Rovai, Ponton, Wighting, & Baker, 2007; Shroff & Vogel, 2009; Wighting, Liu, & Rovai, 2008) also suggest that online students are more intrinsically motivated than their on-campus counterparts at both undergraduate and postgraduate level.

But as Martens, Gulikers, and Bastiaens (2004) argue, online learners are often required to be more intrinsically motivated *because* the learning environment typically relies on intrinsic motivation and the associated characteristics of curiosity and self-regulation to engage learners. In fact, the technology itself is viewed by some as inherently motivating because it provides a number of qualities that are recognised as important for fostering intrinsic motivation: challenge, curiosity, novelty, and fantasy (Lepper & Malone, 1987; Malone, 1981). The novelty factor tends to wear off as users become accustomed to the technology (Keller & Suzuki, 2004) and intrinsic motivation can wane. Frustration with technical problems can also reduce intrinsic motivation.

While the intrinsic motivation of learners is an important consideration, contemporary research studies exploring motivation in these environments is limited in both number and scope (Artino, 2008; Bekele, 2010; Jones & Issroff, 2007). Moreover, the majority of existing studies have adopted either a behaviourist approach that focuses on the environment (e.g., ChanLin, 2009; Keller & Suzuki, 2004), or a cognitive perspective that concentrates on the characteristics of the learner (e.g., Bures, Abrami, & Amundsen, 2000; Wighting et al., 2008; Yukselturk & Bulut, 2007). Both overlook the complex, dynamic, and situated nature of motivation to learn (Brophy, 2010; Turner & Patrick, 2008). The few studies that have adopted a contemporary view (e.g., Shroff et al., 2007; Xie, DeBacker, & Ferguson, 2006) have tended to explore a somewhat limited range of social and contextual motivational influences.

Taken together, these issues highlight the need to explore motivation from a contemporary situated perspective, in 'real-life' online distance settings that include consideration of a broad range of environmental influences.

### **Motivation and self-determination theory (SDT)**

Schunk, Pintrich, and Meece (2008) define motivation as “the process whereby goal-directed activity is instigated and sustained” (p.4). Current theories link motivation to individuals’ cognitive and affective processes such as thoughts, beliefs, and goals (Brophy, 2010). They also emphasise the situated, dynamic relationship between the learner and the learning environment (Turner & Patrick, 2008). Research investigations that explore motivation in online learning environments have adopted a variety of motivation models to support their research (Artino, 2008; Bures, Amundsen, & Abrami, 2002; Xie et al., 2006; Yukselturk & Bulut, 2007). Of these, intrinsic motivation theory has often been used to explore students’ reasons for engagement in online environments (e.g. Shroff & Vogel, 2009; Xie et al., 2006).

An influential theory that explicates intrinsic–extrinsic motivation, and one that has provided the foundation for several studies, is self-determination theory (SDT, Deci & Ryan, 1985). This contemporary theory of situated motivation is built on the fundamental premise of learner autonomy. It argues that all humans have an intrinsic need to be self-determining or autonomous, as well as competent and connected, in relation to their environment. Connell (1990) defines the need for *autonomy* as “the experience of choice in the initiation, maintenance and regulation of activity and the experience of connectedness between one’s actions and personal goals and values” (pp.62-63). When autonomous, students attribute their actions to an internal locus of causality, and experience a sense of freedom and choice over their actions. *Competence* is defined as “the need to experience oneself as capable of producing desired outcomes and avoiding negative outcomes” (Connell & Wellborn, 1991, p. 51). *Relatedness* “encompasses the need to feel securely connected to the social surround and the need to experience oneself as worthy and capable of ... respect” (Connell & Wellborn, 1991, pp. 51-52).

According to SDT, if the environment supports a learner’s autonomy, competence, and relatedness needs, then more autonomous types of motivation (with intrinsic motivation being the best example) are fostered (Ryan & Deci, 2000a). When intrinsically motivated, outside incentives are not required because the reward is inherent in the activity itself (Ryan & Deci, 2000b). In contrast, students who are extrinsically motivated undertake activities for reasons that lie outside the activity (Ryan & Deci, 2000a); for example, achieving high grades, evading negative consequences, or because the activity has utility value such as passing a course in order to earn a qualification, or learning a skill perceived as important for a future career.

Extrinsic motivation processes are explained in terms of external regulation because the reasons for undertaking the task are outside the individual. However, the extent to which an activity is perceived as externally controlled can vary and, therefore, there are different types of extrinsic

motivation. Self-determination theory conceptualises a continuum of regulation that includes amotivation (lack of motivation) at one end, through to intrinsic motivation at the other, with different types of extrinsic motivation sitting in between (see Ryan & Deci, 2000a for a diagrammatic representation of the continuum). The various types of extrinsic motivation emphasise a shift in the extent to which externally motivated behaviour is autonomously determined. They range from externally controlled behaviour with little or no self-determination, to more internal control and self-regulation—where a learner engages in an activity because it is important to their sense of self.

According to the taxonomy, *amotivated* individuals lack motivation or intention to act. This may be because of a feeling of incompetence or low self-efficacy (Bandura, 1997), a perception that what they do will not affect the outcome (Peterson, Maier, & Seligman, 1993), or placing low value on the task being undertaken (Brophy, 2008). Beyond this, extrinsic motivation and intrinsic motivation have often been treated as a dichotomy, especially in earlier research (see Schunk et al., 2008). Along the continuum of human motivation, however, four patterns of extrinsic motivation are identified. *External regulation* is the type of extrinsic motivation most often contrasted with intrinsic motivation, where individuals respond to threats of punishment or the offer of rewards, and tend to be compliant as a result.

*Introjection* is seen in students who engage in a task because they feel they should due to the expectations of others, and feel guilty if they do not. Even though the feelings are internal, the student is not self-determining because they are controlled by their perceptions of how others might see them.

*Identification* is associated with individuals who engage in the task because the results of performing that task may have personal value to them. Regulation is internal in the sense that the individual has chosen the goal, or identifies with it and is aware of its importance. But the motivational pattern is still considered extrinsic because it is the utility value (a means to an end), personal importance, and/or relevance of the task rather than interest and enjoyment in the task itself that determines the behaviour (Brophy, 2008).

The final and most autonomous type of extrinsic motivation is *integration*, where learners engage in the activity because of its significance to their sense of self. Both identified and integrated types of motivation share some of the qualities of intrinsic motivation (Reeve, Deci, & Ryan, 2004; Ryan & Deci, 2000a) and have similar consequences for learning and motivation. This has important implications as it highlights how educators can support motivation to learn by assisting learners to appreciate the importance and value of learning activities even when they are not intrinsically interesting.

### **Self-determination theory and motivation in online learning**

Online motivation studies that have adopted SDT as the theoretical framework are starting to appear (Chen & Jang, 2010; Martens et al., 2004; Rovai et al., 2007; Shroff et al., 2007; Shroff, Vogel, & Coombes, 2008; Xie et al., 2006). However, one notable limitation of these studies has been the tendency to focus only on intrinsic motivation (e.g., Martens et al., 2004; Xie et al., 2006). In doing so, the power of the model to explore a broader range of motivation, particularly more autonomous types of extrinsic motivation, has been neglected. This exclusive focus on intrinsic motivation has also resulted in a tendency by some to characterise online learners as intrinsically motivated (Rovai et al., 2007; Styer, 2007).

This paper presents findings of one aspect of a larger study (Hartnett, 2010) that explored the motivation of pre-service teachers undertaking an online distance learning course. Self-determination theory underpinned the investigation that explored how a broad range of social and contextual factors dynamically influenced motivation to learn by either supporting or

undermining students' perceptions of autonomy and competence. Results presented here from one group of learners, situated within a co-located, distance online learning context, address the question: *In what ways do social and contextual factors undermine learner autonomy and competence when unique circumstances are not taken into account?*

## Research method

This investigation used case-study methodology to explore the complex phenomenon of motivation in a manageable way with a view to advancing understanding (Yin, 2009). While qualitative methods and data were central to the exploratory nature of this study, quantitative analyses were also used to complement and extend the range of evidence (Gillham, 2000). One aspect of a larger case study (Hartnett, 2010) situated within the context of a pre-service teacher education programme within a New Zealand tertiary institution is reported here. Students in this programme were preparing to teach in New Zealand primary (i.e., elementary) schools. The course in which the case study was situated was considered to be online because students were expected to undertake all coursework via the internet. Students received some additional print material (a study guide) and digital resources (a CD-Rom) at the beginning of the semester. The online learning platform used was the WebCT learning management system.

## Context and participants

The case study was positioned within a compulsory integrated science and technology course. Teaching staff consisted of a course coordinator with science expertise and a tutor with technology expertise. The tutor was responsible for the majority of the teaching in the online environment. The boundary for the case study centred on a problem-based learning (PBL) assignment and its associated online activities. Problem-based learning is an instructional approach built on authentic, ill-structured problems which are complex in nature (Sonmez & Lee, 2003). This activity was undertaken over a 6-week period in which students were required to work collaboratively in small groups. All participants had some prior experience of distance online learning. They were also familiar with working with other online students on group assignments.

Participants were recruited from the semester one (February–June) 2008 online distance offering of the course. Respondents (12 in the full case study) were predominantly female and ranged in age from 24 to 55, with 92% in the over-30 age group. All participants were geographically distant from the main university campus where the lecturers were located and were required to complete all coursework via WebCT. Data gathered from one student group (one male and two females) who formed part of the case study is the main focus here, and comparisons are made with the other participants where appropriate. This group was of interest as they were different from other geographically dispersed participants because of their co-location at a satellite campus of the university. This made it possible to meet face to face if they wished. Within the case study, it emerged that being together had an important influence on the motivation and online learning experiences of these students.

## Procedures

Ethical consent to undertake the study was gained prior to data collection. Data collection procedures comprised online questionnaires, semi-structured interviews, archived online data (including online asynchronous discussion transcripts and usage statistics), achievement data and course resources.

Motivation was measured using the self-report Situational Motivational Scale (SIMS) developed by Guay, Vallerand, and Blanchard (2000). It operationalises the SDT continuum described earlier, assessing situational intrinsic motivation, extrinsic forms of motivation (identified

regulation, external regulation) and amotivation. A Likert scale, ranging from 1 to 7, measures each motivation sub-type. Subscale scores for each participant were then used to calculate a single motivation score called the self-determination index (SDI). This follows the weighted calculation described and used in previous research (Ratelle, Baldwin, & Vallerand, 2005; Vallerand & Ratelle, 2002). This calculation gives greater weight to the motivation types at each end of the scale (i.e., amotivation and intrinsic motivation). Overall SDI scores can range from a minimum of -72 to a maximum of +72. Subscale scores were also retained for analysis because the SDI score (an indicator of overall motivation) may not account for participants' endorsement of more than one type of motivation for engaging in an activity (Vallerand, Pelletier, & Koestner, 2008).

In the following section, descriptive statistics are reported for motivation subscale and SDI data for co-located and distance participants and comprised medians (Mdn) and interquartile ranges (IQR). Mann-Whitney U two-tailed tests of significance (Cohen & Lea, 2003) were also carried out to explore whether the participant motivation subscales scores were significantly different between the online co-located and online distance groups. Non-parametric statistical calculations were performed because of the small sample size, the inclusion of ordinal scores in the SIMS motivation scale, and because normality could not be assumed in the underlying population (Siegel & Castellan, 1988). Pseudonyms are used when quoting students.

## Results

Situational motivation scale (SIMS) responses and self-determination index (SDI) scores for co-located participants are summarised in Table 1. A positive SDI score indicates that, overall, more self-determined forms of motivation outweigh more externally regulated types of motivation. A negative SDI indicates an overall experience of less self-determined motivational types (Vallerand et al., 2008; Vallerand & Ratelle, 2002).

**Table 1** Co-located participants' SIMS and SDI scores

Pseudonym	Amotivation	External regulation	Identified regulation	Intrinsic motivation	SDI score
Nadia	27*	28	4	4	-70
Tim	24	24	14	16	-26
Ursula	13	28	19	14	-7

\* Subscale scores can range from a minimum of 4 to a maximum of 28.

The group of co-located participants comprised mature-aged students who described themselves as committed learners and viewed academic success as personally important, suggesting that they often experience more autonomous motivation in learning contexts:

...my group members ... they're very diligent people. ... all three of us are high achievers.  
(Nadia – Interview q4)

However, all three co-located students had negative SDI scores (see Table 1) resulting from high amotivation and external regulation scores. Comparisons of median subscale and SDI scores with the online distance participant group (see Table 2) indicate that the co-located group reported higher median levels of less self-determined types of motivation (i.e., amotivation and external regulation).

Table 2 SIMS and SDI medians and interquartile ranges for online co-located and distance participants

Participants		Amotivation	External regulation	Identified regulation	Intrinsic motivation	SDI score
Online co-located	<i>Mdn</i>	24	28	14	14	-26
	<i>IQR</i>	7	2	7.5	6	31.5
Online distance	<i>Mdn</i>	5	16	22	19	30
	<i>IQR</i>	12	12	2	5	46

Statistical comparisons showed a significant difference between the amotivation scores reported by co-located and distance students ( $U = 3.0$  (2-tailed),  $p = 0.05$ , Effect size ( $r$ ) = -0.57). Comparisons between the remaining subscale scores as well as SDI scores for the two groups showed no significant differences. Although external regulation scores were not significantly different between the two groups, there was a noticeably smaller variation among the scores reported by the co-located participants (see Table 2). This indicates that they more consistently perceived certain aspects of the learning environment as beyond their control. This, together with the difference in reported amotivation scores, suggests that the co-located participants perceived that certain factors within the environment more consistently undermined their motivation when compared with the distance participants.

In order to untangle the multiple influences that combined in complex ways to undermine the co-located students' motivation, the SDT concepts of autonomy and competence (Deci & Ryan, 1985) are used to organise the findings and subsequent discussion. While a range of factors were identified as influential in undermining (as well as supporting) the needs of all participants in the wider study, the results reported here focus on contrasting those highly salient to this group because of their different circumstances (i.e., being co-located at the satellite campus) with the online distance participants. Few factors emerged as undermining the co-located students' perceptions of their relatedness needs being met. Indeed, being together, along with their respect and support for each other, appeared to mitigate somewhat the factors that contributed to undermine their autonomy and competence needs. This enabled them to successfully complete the assignment.

### Factors that undermined the autonomy of both co-located and fully distance students

When learners' autonomy needs are unfulfilled, the perception that one's actions are initiated and regulated by outside forces are prominent (Reeve, Ryan, Deci, & Jang, 2008). From the data there emerged a number of important themes that contributed to the undermining of all participants' needs for autonomy, including the co-located students.

#### High workload

Perceptions that a high workload undermined the autonomy of all participants emerged as a salient theme. Participants felt that the size and corresponding time and effort required to complete the task were considerable, and had the effect of students feeling 'consumed' by the PBL process. Nadia's and Tim's comments that it "took a lot of time and effort to complete" (Nadia – Questionnaire q29) and "became almost all-consuming" (Tim – Interview q1) are representative of comments made throughout the interviews by co-located participants and were reflected online distance participants.

### **High-stakes assessment**

Coupled with perceptions of high workload, the pressure of assessment was highly salient during the PBL task because it was worth 60% of the entire course mark. This pressure not only had a detrimental effect on perceptions of enjoyment of the experience—thereby undermining intrinsic motivation—it also promoted anxiety, leading to the moderate-to-high reported external regulation and amotivation scores:

... the fact that 60% of the mark came from ... one assignment and if you missed the mark on that then you are you're lost, you failed ... and to me that's really tough ... and that worried me. (Ursula – Interview q20)

While the perception of high-stakes assessment did not always translate to high-reported amotivation and external regulation scores among the distance group, these participants were also aware of this issue:

I mean this one was 60%. It is a huge amount of marks that you can either lose or get. (Distance student10 – Interview q4)

### **Time constraints**

The combination of perceptions of high workload and the salience of assessment contributed to the emergence of the third important theme: perceptions of time constraints. The common observation “that the timeframe was very short and we were scrambling to get the project completed to our satisfaction” (Distance student 11 – Questionnaire q26) left many participants (from both co-located and distance groups) feeling that much of the learning process was beyond their control; that is, externally regulated. One consequence of the perceived high workload, high-stakes nature of the activity, and limited time to complete it, was the perception that choice was limited:

But the time constraints ... you can look at the marking schedules so you know what you need to get out at the end so you're making decisions based on that and that starts to limit your choice. (Tim – Interview q8)

### **Learning activity–technology mismatch**

Perceptions of being time poor resulted, in turn, in the time-consuming nature of the asynchronous communication medium becoming more apparent to all participants. Among the collaborative groups working on their PBL assignments, communication via the WebCT discussion board was perceived as “very time consuming” (Tim – Questionnaire q25) and “slowed down the communication” (Ursula – Interview q2) particularly in terms of the “endless hours [spent] typing questions” (Distance student 11 – Questionnaire q30). Delays were also experienced in the communication process “when it came time to ... make a group decision on things. Sometimes this ended up taking several days just to decide” (Distance student 9 – Questionnaire q25).

The net result of these multiple external pressures saw learners turning to synchronous forms of communication in an attempt to autonomously regulate their own learning process. For example, one fully online participant kept in touch with her group via phone:

I much prefer the phone. ... We discovered that that worked really, really well for us. (Distance student 1 – Interview q11)

For the co-located group, synchronous communication this meant meeting face-to-face “after class or before class or between classes” (Ursula – Interview q2). The group viewed this as a positive thing: “I think we had the advantage here that at least we can do some stuff face to face” (Tim – Interview q3).

Although meeting face to face was helpful in some ways, it increased the burden on the mixed-mode students who were required to also participate in online discussion. This extra workload enhanced a perception among the group that the chosen technology did not provide a suitable environment in which to undertake the PBL activity. In particular, the requirement to collaborate via the asynchronous discussion board contributed greatly to the perception that the technology did not fit the required activity (i.e., technology/task mismatch).

WebCT does NOT complement this course. I strongly believe that this type of 'hands on' practical course should be taught face to face. (Nadia – Questionnaire q25)

### **So what was different for the co-located group?**

While the factors discussed above were highlighted by all participants as contributing to the undermining of motivation, two additional contextual features emerged as highly salient to the co-located participants because of their unique circumstances.

#### **Course expectations perceived as controlling**

Course expectations required students to communicate with each other online, assisted by the instructors. The immediacy of face-to-face communication (noted above) allowed the co-located group to regulate the ongoing decision-making processes characteristic of PBL. Consequently, the expectation that required them to be online, and visibly discussing their ideas, without regard to their situation, engendered a sense of compulsion that undermined their autonomy needs.

When you're doing an online course and you're doing it with people that you talk to every day, WebCT is a handicap. Well not a handicap, it's a nuisance because you have to be seen to be using WebCT. There doesn't seem to be a(n) ... understanding of the fact that we were working, we had to be seen to be working ... we were expected to be putting something on, on a regular basis which was a nuisance from our point of view. (Ursula – Interview q10)

Not having a genuine need to enter into online discussions with each other, coupled with feedback from teaching staff that decreased over time (a feature of the PBL approach), meant that the requirement to interact online to 'show' progress contributed to students' high reported external regulation scores:

We just put it online for the sake of the lecturers so they knew what was going on because ... they expected to see what was happening. (Nadia – Interview q2)

Once again, the lack of alignment between the learning activity and technology used is apparent here. Furthermore, the lack of accommodation of these students' unique circumstances (i.e., their ability to meet in person) made this mismatch even more prominent and contributed to a lack of control as well as an increased workload.

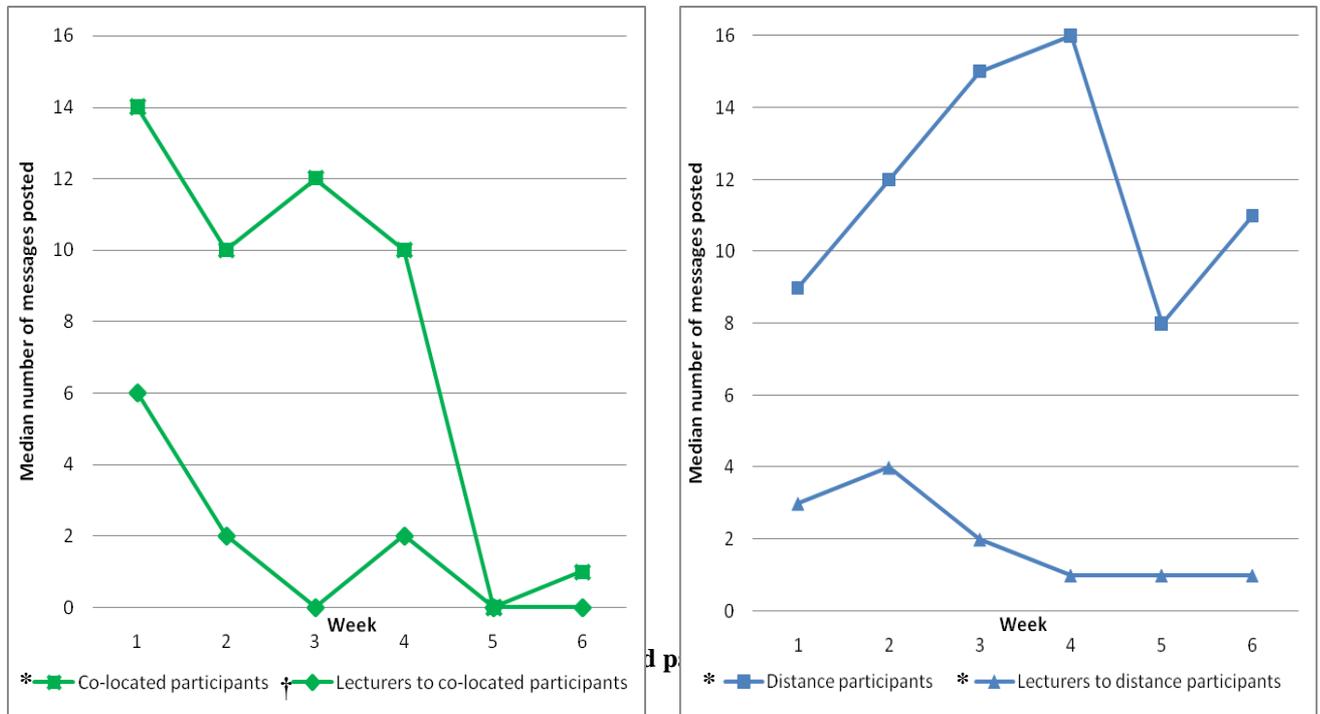
#### **Learning design that gradually reduced instructor input**

The PBL approach adopted in this course required students to gradually take ownership of their own learning, with the instructor becoming more of a facilitator or guide as the 'problem' progressed (Torp & Sage, 2002). The instructors used the asynchronous discussions to provide input (both qualitative and quantitative), particularly in the early stages of the process when significant guidance and scaffolding were needed. Instructor input was then gradually reduced as learners clarified their approach and direction. Before they started the task students were made aware that there would be a gradual reduction of guidance and feedback.

The unique situation of the co-located group meant that the only useful purpose served by communicating online was the opportunity to interact with lecturers in order to accurately appraise their level of competency and progress. But because the level of lecturer-initiated feedback dropped off as time went on, they saw little point in continuing with what they felt was

an ineffective form of communication, and they shifted toward face-to-face meetings. This drop-off in asynchronous discussion is clearly demonstrated in Figure 1, which shows how the co-located group members' decrease in median postings mirrored that of the instructors.

Figure 1 shows that lecturers posted 8 of the 10 messages to the co-located group in the first 2 weeks of the PBL activity, further supporting the perceptions of the group members that lecturer-initiated contact dropped off after the first 2 weeks.



**Figure 1** Number of messages posted by co-located participants, distance participants, and lecturers  
 \* Median number of messages posted † Total number of messages posted to co-located group

Perceptions that communicating via WebCT served no useful purpose because it was not meeting their competence needs comes through strongly in statements from these group members:

We did feel that WebCT would be a useful tool to allow lecturers to observe our process and thinking, but when we became aware of the limited involvement and feedback from lecturers, we migrated toward what we felt were more efficient forms of communication. (Tim – Questionnaire q25)

I mean we had no contact from Owen or Dan [the lecturers] from about the second week into it. So if we were off track, we didn't really have any way of knowing. So that was the hard part. (Ursula – Interview q20)

While a similar kind of decrease occurred in the median number of postings by the lecturers to the distance participant group (see Figure 1), this was not mirrored by the distance students themselves. In fact, the median number of messages posted by distance students continued to increase until week 5, when a marked drop occurred as students worked toward assignment completion. These differences in online behaviour suggest that distance participants saw a purpose in communicating this way, whereas the co-located students did not.

## Discussion

Proponents argue that PBL fosters intrinsic motivation within learners because they are free to pursue what is interesting and relevant to them (Hmelo-Silver, Nagarajan, & Derry, 2006). However, the devil is in the detail. If insufficient scaffolding is provided, learners may feel lost and unsupported. The scaffolding can be a part of the structure and content, or provided through dialogue—for those working remotely, the latter worked fairly well. However, for co-located students who took alternative routes to communicate, this support was reduced.

Analysis of the co-located students' SIMS data (see Table 1) showed moderate-to-high external regulation and amotivation scores (less self-determined types of motivation) and moderate-to-low level of more autonomous types of motivation (including intrinsic motivation). These were among the highest amotivation and external regulation scores reported by participants as a whole, as evidenced by the high median subscale scores when compared with the distance group (see Table 2). In other words, the co-located students primarily experienced less autonomous forms of motivation, suggesting that certain situational factors contributed to undermine their autonomy and competence needs.

As with the distance students, the co-located students perceived that the PBL assignment involved a high workload. The pressure of workload was further exacerbated by the high-stakes nature of the task (60% of the overall course mark). Together, these influences were experienced as external pressures that contributed to the high external regulation scores reported by these participants. Possible reasons for the perceptions of high workload may be found in the practicalities of undertaking a PBL activity in an online environment. That is, the requirement for regular, ongoing communication and decision-making among group members contributed to the workload when it had to be done both online and face to face. Alternatively, lack of necessary prior knowledge and experience associated with PBL as described in the larger study (see Hartnett, 2010) may have also contributed to learners' perceptions of high workload (Kember, 2004).

The combination of high workload and salience of assessment resulted in perceptions of time constraints that left the co-located students (as well as several of the distance participants) feeling that much of the learning process was beyond their control (i.e., externally regulated). The impact of time pressures due to external factors on student motivation (Reeve et al., 2004) and decisions to persist or drop out (Kuh, 2003) are well documented. Time constraints have also been linked to decreasing intrinsic motivation of online learners (Cheung, Hew, & Ling Ng, 2008; Xie et al., 2006), level of involvement in asynchronous discussions (Anderson, 2006; Anderson & Simpson, 2004), students' decisions to persist or not with online courses (Jones & Issroff, 2007; Willging & Johnson, 2004) and reduced personal control (Garrison & Baynton, 1987).

These pressures, in turn, highlighted the constraining nature of the asynchronous communication medium. In other words, asynchronous communication was perceived as not being well suited to the frequent, ongoing, collaborative, decision-making processes characteristic of PBL (i.e., task/technology mismatch), an effect exacerbated by face-to-face meetings that highlighted its weaknesses. The net result of these multiple pressures saw the co-located group reducing online asynchronous communication to speed up group processes in order to meet externally imposed deadlines. The expectation that required them to be visible online and discussing their ideas in an asynchronous environment therefore engendered a sense of compulsion that undermined their autonomy needs.

Instructors provided some input in asynchronous discussions—this input was gradually reduced as a feature of the PBL approach. However, given the unique situation of the co-located students,

the only useful purpose served by communicating asynchronously online was that it provided opportunities to receive guidance and feedback from the instructors to enable students to accurately judge their level of competency and progress. When the co-located students perceived that the involvement and feedback from lecturers decreased, they shifted to face-to-face discussions and their online communication dropped off. In other words, perceptions of a reduction in competence feedback (i.e., information about being 'on track') meant the co-located group saw little purpose in continuing with asynchronous communication.

Previous research has also identified the importance of learners having an authentic reason to communicate online with their peers, both in terms of engagement (Jones & Issroff, 2007; Rovai, 2007) and motivation (Xie et al., 2006). Furthermore, requirements to interact online imposed by lecturers having a detrimental effect on personal agency (Anderson, 2006), and an asynchronous discussion format disrupting problem-based and problem-solving discussions (Anderson & Simpson, 2004; Kortemeyer, 2006), have been noted elsewhere.

Collectively, these influences were experienced as external pressures that contributed to the high external regulation and amotivation scores reported by these participants. This is consistent with other research studies that have shown that external events that do not fit the needs of learners can have a detrimental effect on perceived autonomy and competence and therefore self-determined types of motivation (Reeve, 2002; Reeve et al., 2004).

Several of the factors discussed here (i.e., high-stakes assessment, high workload, time constraints and technology/task mismatch), were also reported by fully distance students as detrimental to autonomy, in particular. However, course expectations that required asynchronous discussion among group members and the gradual reduction of instructor input (a feature of the PBL approach) did not have the same degree of salience. This suggests that fully distance students saw a clear need to engage with each other online, whereas co-located students did not. For fully distance students the online technologies aligned reasonably well with the processes and pedagogies used, whereas for co-located students, the technologies and pedagogies were mismatched.

We should emphasise that this was a small, qualitative study and that caution should be observed when drawing strong conclusions and generalisations. It is quite possible that the fact that the students in question had chosen to be co-located while those studying fully at a distance had chosen otherwise indicates differences in motivation that would have a large effect on our results. This aligns with our conclusion that motivation is situation-dependent. When considering the many factors that affect student motivation it is not possible, or desirable, to consider any factors in isolation. The combination of methods, processes, electronic and other technologies, along with the contexts, needs and interactions of students, create an individual learning context.

Amongst other things, this highlights that, contrary to Clark (1991), pedagogy alone is not the determining factor in the success of an educational endeavour, and technology *does* make a big difference. In this study, the identical pedagogy and learning design had notably different effects for students in different situations using similar technologies. The interesting issue is *how* it made a difference in this study. A good part of the reason for the differences we observed lay in the fact that the learning design was augmented by the students to fit their perceived needs. While they may have initiated the face-to-face interaction themselves, the overall requirement to post online was perceived as controlling and unnecessary.

In almost all educational contexts this adjustment by students is not only desirable but almost inevitable: learning does not happen in the design but in the application of that design. So, no matter how carefully we may design the lessons, we have to remember that it will only be part of the whole learning process. Student learning is not the same thing as teaching students. In this

case, being together allowed these students to augment the planned process and, in doing so, unintentionally undermined their motivation for the activity. This suggests the need, when designing and implementing a course, to be aware of what else students are doing within the learning context and, if necessary, to adapt the teaching approach accordingly.

## Conclusion

Using self-determination theory, a contemporary theory of motivation, it was shown how certain contextual influences beyond the control of one group of co-located learners had an unfavourable influence on their motivation to learn. Lack of consideration of their unique situational circumstances unintentionally undermined autonomy and competence needs and contributed to some of the highest reported amotivation and external regulation scores among the entire participant group. In other words, motivation to learn was situation-dependent and influenced by online teaching practices and the design of the learning activity. In particular, the course requirement to interact online was perceived as a nuisance that served little purpose because meeting face-to-face was possible and better suited their needs. The implication is that differing circumstances of students within the learning context need to be considered and, where possible, accommodated in order to support the expression of high quality motivation (including identified regulation and intrinsic motivation) among learners.

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