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Bridge21 – exploring the potential to foster intrinsic student motivation through a team-based, technology-mediated learning model

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It is generally accepted that intrinsic student motivation is a critical requirement for effective learning but formal learning in school places a huge reliance on extrinsic motivation to focus the learner. This reliance on extrinsic motivation is driven by the pressure on formal schooling to ‘deliver to the test’. The experience of the use of ICT in formal learning is marked with a naive and largely unfulfilled assumption that it would of itself promote a ‘game-changing’ shift in student motivation. This study investigates the effectiveness of a team-based, technology-mediated model called Bridge21 to encourage intrinsic student motivation. The data for the study come from 425 secondary school students, average age 16 years, who participated in workshops of 3.5 days in duration. The workshops took place in an out-of-school learning environment in one academic year. Bridge21 seeks to provide a vehicle to allow the transfer of control of learning from the teacher to the team and in this way to encourage and promote student autonomy. The principal findings reported in this paper are that participation in the workshops had a direct positive impact on the students’ perceptions around their learning and on their intrinsic motivation to learn.

Keywords: intrinsic motivation; teamwork; technology-mediated learning; non-formal learning

1. Introduction

Learner motivation is a vital enabler for deep and effective learning. Conversely, lack of the same learning ingredient is a chief inhibitor to deep and effective learning (Covington, 2000; Maehr \& Midgley, 1991). Intrinsic motivation arises from inside the individual and is driven by the pleasure and satisfaction gained from completing or working on a challenge. Intrinsic motivation carries a unique possibility to release human potential (Ryan \& Deci, 2000). It is well understood in research that children’s intrinsic motivation to learn decreases from pre-school through secondary school and this is a huge challenge for effective learning (Skinner \& Belmont, 1993). The intrinsic motivation of the learner is directly affected by the set-up of the learning regime, which can be characterised by the degree of student autonomy that is facilitated, the orientation of learning goals, the relationship among peers, the level of collaborative working, the student–teacher relationship and the

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social environment of the classroom (Wentzel & Wigfield, 1998). These elements of a learning regime that impact motivation are comprehended within self-determination theory, as described by Ryan and Deci (Ryan & Deci, 2000). The issue of student control is particularly critical to intrinsic motivation (Ames, 1992). A learning regime could usefully reference the ‘social pedagogy’ as identified by Blatchford, Galton, Kutnick, and Baines (2003), who argued that learning and motivation are both developed in a social context which includes inter-student relations, teacher–student relations, classroom layout and the nature of tasks undertaken.

Separately, information and communications technology (ICT) was touted as an unstoppable force that would change learning and learner motivation and orientation (Conole, 2004). However, there is little evidence in school that the introduction of ICT has prompted a change in pedagogy to a more student-engaged classroom practice. Instead, it is argued that the hype surrounding ICT has flattened the reality of on-the-ground implementation (Conole, 2004; Livingstone, 2012; McGarr, 2009).

There is evidence however that learning regimes which take cognisance of how students perceive, relate to and use technology in their social lives and which encourage exploration and curiosity are more likely to tap into intrinsic motivation (Martens, Bastiaens, & Kirschner, 2007). Enhancing student motivation involves valuing effort and implementing effort-based learning strategies through the design of mastery-oriented learning structures (Ames, 1992). Effecting a change in student responsibility for his or her learning requires a change in who leads the learning. Resolving Freire’s teacher–student contradiction critically requires a ceding of control by the teacher (Freire, 2000; Panitz, 1999). To quote from Freire:

To resolve the teacher–student contradiction is to exchange the role of depositor, prescriber, domesticator for the role of student among students would be to undermine the power of oppression and serve the cause of liberation [sic]. (Freire, 2000, p. 62)

This sense of liberation in learning can be linked with enjoyment of the learning experience (Aubusson, Schuck, & Griffin, 2006). Indeed, enjoying a learning experience and drawing intrinsic motivation from learning are intuitively linked; Husman and Lens (1999) stated: ‘Students are intrinsically motivated when learning or performing at school is a goal in itself’ (p. 113).

The pressure on formal schooling to ‘deliver to the test’ reduces the scope to provide for learning that is student directed and develops key competencies. It is argued that new models of practice or ‘vehicles for learning’ are required to provide for learner control and to address this student motivation challenge (Claxton, 2007, 2009; Drexler, 2010; Ford, Smith, Weissbein, Gully, & Salas, 1998).

Bridge21 is a team-based, project-oriented, technology-mediated learning model (Lawlor, Conneely, & Tangney, 2010). It promotes a shift in control from teacher to student, the development of peer learning, learning with technology and collaborative working (Mistler-Jackson & Butler Songer, 2000; Resnick, 2001). It is designed to embrace learning and evaluation strategies that value effort and personal mastery. This is a deliberate strategy to try to break the performance–ability connection, to raise the students’ perception of their own ability and to foster intrinsic motivation.

2. Research focus
The Bridge21 model and research were developed and implemented as part of the authors’ university’s outreach programme and in excess of 5000 students have
participated in out-of-school workshops since 2007. This paper investigates the effectiveness of the model in promoting intrinsic learner motivation through examining the impact of the workshops on the participants. The data which underpin this study are based upon the participation of 425 secondary school students, average age 16 years, who took part in workshops of 3.5 days in duration during one academic year. The findings from the questionnaires are supported by focus group interviews with eight groups of three to four students representing three successive years of the programme. A set of indicators of the presence of intrinsic motivation are identified in the literature and their presence in the evaluation data is offered as evidence of the efficacy of the model in meeting its objective in motivating students.

3. Technology and motivation

A naive expectation that the application of technology in learning on its own would lift student motivation was commonplace in the early implementations of ICT in a school context (McGarr, 2009; Mistler-Jackson & Butler Songer, 2000). One flaw at the heart of this belief was the continued reliance on individualised instruction with a high dependency on the teacher to direct the learning. Applying an individualised teacher-led approach to working with ICT may still be observed in the computer science labs of many second-level schools (Conole, 2004; Donnelly, McGarr, & O’Reilly, 2011; McGarr, 2009). Second-level schools here include secondary, vocational, community or comprehensive schools providing learning after primary school and before third-level colleges or universities. Conversely, the typical characteristics of a learning experience that is likely to enhance student motivation involve ceding control of the learning to the student and facilitating collaborative working (Ames, 1992).

Engaging adolescents on personally meaningful activities in a socially supportive environment is a strong motivation to producing worthwhile work and higher order learning (Pintrich, Roeser, & de Groot, 1994; Ryan & Patrick, 2001). The adolescent learners of today are likely to be more technically competent in ICT than most of their teachers. This can be perceived as a threat to traditional models of teaching and learning and the didactic teacher–pupil power relationships (Resnick & Rusk, 1996). The adolescent use of computers has much deeper implications than the development of specific technical skills. How adolescents use computers is related to how they see themselves and how they relate to society (Dinter, 2006). Tapping into this relationship between adolescents and computers provides a potential avenue to improved learning (Dinter, 2006). While traditional and formal education is strained to accommodate these trends, non-formal educational models offer more flexible opportunities (Resnick & Rusk, 1996).

A central aspect of human knowledge combines the ability to think creatively through analysis, reflection and generation of ideas and to act creatively implementing ideas, building things and experimenting (Claxton, 2006). Moving work through technology to a more thoughtful and reflective context is potentially a motivational strategy when working with young people (Sharry & McDarby, 2003). It may be argued then that if a learning initiative approaches the use of ICT from a skills acquisition perspective only or for the mere access to content and avoids how young people can learn with and through technology, it potentially excludes key learning and motivational opportunities.
4. Models for learner engagement, autonomy and motivation

A number of models for learning have been developed and applied in out-of-school contexts to attempt to exploit the potential of technology to engage young people. Instances of such models include: Computer Clubhouse, Fifth Dimension, Pincel y Ratón (Alexander & Wade, 2000; Martínez Arbelaiiz, Gorospe, & Miguel, 2009; Mayer, Quilici, & Moreno, 1999; Resnick & Rusk, 1996). They share common characteristics in their attempts to encourage creativity and learning through the affordances and motivational potential of ICT (Wong, Packard, Giroda, & Pugh, 2000). The Computer Clubhouse is a widely applied exemplar (Kafai, Peppler, & Chiu, 2007). Devised at Massachusetts Institute of Technology in the mid-90s, the Clubhouse is guided by four core principles: support learning through design experiences, help participants build on their own interests, cultivate an ‘emergent community’ and create an environment of respect and trust (Resnick & Rusk, 1996). The Clubhouse approach seeks a balance between directive and exploratory learning, working to build confidence, self-expression and intrinsic motivation (Resnick & Rusk, 1996; Rusk, Resnick, & Cooke, 2009). The Computer Clubhouse model involves the assembly of elements and guiding principles that could usefully be included in many ICT-mediated learning experiences. These include: design, teamwork & collaboration, creativity, stimulating learning spaces, social context, reflection, learning by doing, peer learning, children teaching children, project-based activity, personally meaningful activities and mentoring. The manner in which these components are assembled and applied is critical to the effectiveness of any ICT-mediated learning model (Rusk, Resnick, & Cooke, 2009).

Collaboration and group work are often mentioned in connection with ICT-based learning interventions but it is very important to realise that group work is unlikely to be successful without preparation and training to develop group work skills (Blatchford et al., 2003). While it is generally acknowledged that group work and ICT are powerful learning partners (Alavi, 1994; Baskin, Barker, & Woods, 2005; Pauleen, Marshall, & Egort, 2004), the systematic building of learning teams accompanied by the appropriate deployment of group-based learning projects is generally absent from learning programmes (Galton & Hargreaves, 2009).

5. Student autonomy and motivation

Effecting a change in student responsibility for their learning requires a change in who leads the learning (Maehr & Midgley, 1991). It is necessary that teachers relinquish some of their direct control and adopt a more indirect influencing style so that the student starts on a path that leads to them taking responsibility for their learning and becoming self-directed learners. In team-based learning, Adair identified the task as a unifying objective for the team with a shared responsibility for its completion, rendering the task as independent of the individual (Adair, 1988). Through this approach, control of the learning moves to the team and the team is addressed to the task. The individual team members enjoy the support of their peers and the comfort of shared responsibility (Pyle, 1995). This opportunity could provide an antidote to the phenomenon of learned helplessness and poor motivation evident among struggling students in formal learning contexts (Pell, Galton, Steward, Page, & Hargreaves, 2007). In a team-based learning environment, a challenge arises in that top students may resist the loss of what for them is a personal unilateral learning strategy and may need reassurance while the remainder of the students see less risk in trying than in not trying (Pyle, 1995).
6. Bridge21 – a learning model to promote student engagement

Promoting a structure to support a student-led, mastery-oriented, collaborative learning environment presents a challenge, given that formal learning models are predominantly wedded to control systems that are vested in the teacher (Claxton, 2006; Drexler, 2010). In essence, a structure is required that encourages the student to make choices while receiving encouragement, empathetic support and guidance (Pyle, 1995). The key elements of a learning model that is likely to lift learner motivation as evidenced from literature include: student autonomy and control of the learning; building a sense of personal responsibility for the learning; mastery orientation of learning goals and valuing effort in the learning; collaborative working and peer learning; building a sense of enjoyment and fun in the learning; and alignment of the use of ICT in learning with the learners’ use of ICT in their social lives (Ames, 1992; Dinter, 2006; Ryan & Deci, 2000; Wentzel & Wigfield, 1998).

The Bridge21 model brings these elements together and has been refined over the years based upon feedback from participants, teachers and our deepening understanding of the literature (Lawlor et al., 2010; Tangney, Oldham, Conneely, Barrett, & Lawlor, 2010). It has eight distinct elements, as described in Figure 1:

1. teamwork;
2. ready-at-hand technology;
3. an appropriate learning space;
4. an emphasis on reflection as an integral part of the learning process;
5. the presence of an (adult) mentor or facilitator;
6. project work;
7. social learning protocols;
8. mastery goal orientation.

The model exploits the learning space to facilitate and enhance teamwork and autonomy for the team including a specifically dedicated team space in a semi-enclosed ‘pod’. Careful consideration of providing the physical space where the team goes about its business is a driver of learning (Jolliffe, 2007; Taylor, 2007).

Team and individual reflection are built into the learning exercises so as to promote metacognition in the learning. The adult role is to encourage and affirm but not to lead or to intrude on the team; rather, to adopt the role of supportive mentor (or ‘grandmother’) as described by Mitra (Mitra, 2010). Informal social protocols are adopted with interaction on a friendly ‘first name’ basis between all involved so as to enhance the sense of learning together and to reduce perceived ‘authority’ barriers. The learner and teams are encouraged to build skills and a sense of developing mastery with avoidance of normative scales or performance comparisons which can inhibit intrinsic motivation (Ames, 1990). Bridge21 offers a vehicle through its team-based structure that allows the teacher to cede control to the team and in the process offers a model that embraces mastery goal orientation and peer collaboration.

7. Implementation

The model has been implemented in a coordinated programme on the campus of the authors’ university since late 2007 and has informed a range of learning workshops...
including implementations centred on multimedia skills, introduction to programming, second language acquisition and mathematics (Tangney et al., 2010).

7.1. Participants
This study focuses on the main implementation of the model, which is with Year 4 secondary school students aged between 15 and 17. The participants came from schools across the country. The programme was carried out in school time but in an out-of-school context through workshops in specially designed learning spaces on a university campus (see Figure 2). The participation of the students was agreed and arranged with their schools with each workshop comprising up to 25 students of mixed gender, typically drawn from three schools. The workshops ran for 3.5 consecutive days (22 hours) between 9 am and 3 pm. Two different series of workshops were included in the study. This first series involved 300 students from 15 second-level schools from designated areas of economic disadvantage near our university and the content of the workshops is described below. The second series of workshops, called CS-TY, focused on computer programming mostly based around the Scratch visual programming language (Resnick et al., 2009), and 125 participants took part drawn from 40 schools nationwide (Tangney et al., 2010). In total, 21 workshops were conducted with the different cohorts of students spaced over a single academic year. A summary of the activity implementation may be seen in Table 1.

Figure 1. The Bridge21 learning model.
7.2. Workshops

Concepts in teamwork and team dynamics were introduced at the commencement of each workshop through team games. Additionally, coaching in team skills and reflection on team performance featured during the workshops. This team and team skill development focus was in line with the recommendations of Blatchford et al. (2003) on the importance of investing in the necessary skills for working in groups. A measure of inter-team competition was encouraged. However, this was moderated through an encouragement to friendly cooperation between teams. The internal interdependence of team members to achieve team tasks promoted a team spirit with team members inclined to support and encourage each other (Slavin, 2010).

The 3.5 day Transition Year workshops challenged students to research and explore various topics, create multimedia artefacts (videos, blogs, podcasts, games etc.) and make presentations to their peers and adult mentors. The Computer Science workshops involved an introduction to computer programming and the creation of a computer game. A strict deadline was imposed on teams to deliver their work on time each day with a number of milestones along the way.

8. Research design and method

A mixed-methods design was followed with an emphasis on a strongly qualitative approach with embedded quantitative data (QUAL-quan) (Creswell &
Plano-Clark, 2011). Qualitative and quantitative approaches are mixed within and across two discrete stages of the research process. The qualitative and quantitative data are integrated in both the data collection and data analysis processes. The essential purpose of mixed-methods research is to integrate the quantitative and qualitative data to draw on the strengths of each and this is our intent in adopting an integrated mixed-methods approach (Creswell & Plano-Clark, 2011). The data collection process was sequential with the questionnaires administered in conjunction with the workshops (pre and post). The focus group interviews were conducted at a time interval of between six months and three years after the engagement, thus allowing the sustained impact of the experience to be assessed. Overall the research model followed a pragmatic approach so as to provide for a more complete understanding of the research and to gain insight from multiple perspectives (Teddlie & Tashakkori, 2009).

The Bridge21 programme – originally named ‘Bridge to College’ – has been running since late 2007 and the questionnaire data presented here is from the 2009–10 academic year. The data from focus groups are taken from academic years 2007–08, 2008–09 and 2009–10. Questionnaires were administered at the commencement of each workshop and at the close 3.5 days later. The pre-activity questionnaires were focused on building a profile of the participant cohort and are not used in this paper. The post-activity questionnaires featured seven questions including three open questions and a Likert question set featuring nine items. The questions were general to support other research and were not framed to specifically address the key markers for motivation evident from the literature. The questionnaire was prepared before this focus on motivation was considered and the correspondence with key markers for motivation was considered later.

The focus group interviews were semi-structured and conducted with eight groups of students from five schools spanning three years of the programme. They were conducted over a two-week period in Year 3. The issues explored in the focus groups were prompted by responses to open questions in the post-activity questionnaires. The focus group prompting questions were conversational so as to encourage an informal environment and to encourage participants to engage in conversation in response (Krueger & Casey, 2009). Examples include:

- What did you think was good about your experience at Bridge21?
- What did you think was bad about the programme? Can you think of anything that was a downer or anything that you didn’t like about it?
- You say you learned from each other, can you explain that?
- Is that different from the way you would usually learn in school? Tell me why it’s different.
- Is that anything to do with what you experienced in Bridge21 or do you think you’re just getting more mature anyway?
- Can you talk to me a little bit about how you look at your personal learning?
- Did Bridge21 play any part in terms of you looking at the way you learned that personal sense of responsibility, did it play any part in that? Or were you getting there anyway?
- Can you think of things that you did subsequently, either in school or out of school, where you used the skills that you would have picked up through that week, the ones you’ve mentioned?
The post-activity questionnaires featured open questions to yield qualitative responses:

- How would you rate your experience at the Bridge 21 programme and why do you feel this way.
- Three things I learned about myself and how I learn during Bridge21.
- Three things I learned about college during the Bridge21 programme.

The data collection instruments are summarised in Table 2 and the approach to triangulation is shown in Figure 3.

8.1. Data analysis

The data from both the post-activity questionnaires and focus groups were analysed through a process of open coding based on conceptual labels (Strauss & Corbin, 1998) followed by categorisation and theming (Creswell, 2002). The pre-questionnaire information is not relevant to this paper and was largely focused on the propensity of the participants to go to college. The data were broken into manageable segments and a first pass of code labels were applied consistent with a conceptual ordering. This process yielded a set of codes that were filtered and refined to select those most relevant to the issue of student motivation. These codes were then grouped in categories. The categories suggested themes from the data. This process

<table>
<thead>
<tr>
<th>Table 2. Data collection instruments.</th>
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<tbody>
<tr>
<td>Student pre-activity questionnaire</td>
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<tr>
<td>Student post-activity questionnaire</td>
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<tr>
<td>Focus group interviews</td>
</tr>
</tbody>
</table>

Figure 3. Triangulation of data.
of consideration and interrogation of the data and assignment and refinement of codes was applied iteratively with successive passes of the data, both focus group transcripts and open questions from post-questionnaires, repeatedly re-examined to identify indicators from the literature relevant to the emerging themes until finally a subset of themes (six) relevant to the research question were surfaced (Creswell, 2002). The approach could be described as abductive with logical connection made between the theory as surfaced in the literature and the data (Teddlie & Tashakkori, 2012). This is essentially a pragmatic research paradigm (Feilzer, 2010; Morgan, 2007).

The qualitative analysis process was supported with NVivo 8 Computer Aided Qualitative Data Analysis Software. Figure 4 summarises the coding and analysis process. The data from the post-activity questionnaire were coded and entered into the statistical package SPSS for analysis. In particular, frequency distributions were obtained for the nine Likert-style items. Pearson correlations between these items were calculated, and the potential of these items for forming a scale was investigated using Cronbach’s alpha.

9. Results and discussion

The application of the qualitative analysis process initially gave rise to 25 codes refined to 18, which were grouped in six categories as follows: (i) Social Learning, (ii) Skills Acquired, (iii) Personal Insight, (iv) Peer Learning, (v) Learning Journey, (vi) Working with Others. The categories indicated six relevant themes. The themes emerging are as follows:

(1) Indications of an increased sense of personal responsibility for learning and improved propensity to self-directed learning.
(2) Indications of mastery and skills development.
(3) A positive response to the team experience and its role in their learning.
(4) An improved attitude to technology and its place in their learning.
(5) Metacognitive consideration of learning.
(6) A sense of enjoyment and fun in the learning.

The outputs of this analysis are summarised in Figure 5.

It is clear from the data that these themes were very significant for the participants and the focus group discussions resonated with unprompted consideration by the participants of how these themes impacted their attitude and relationship to their learning.

The learning model was structured and the workshops were implemented with the objective of motivating the students. The research seeks evidence that this objective has been achieved and the extent of its achievement. The research question addressed is whether Bridge21, with its particular team-based, technology-mediated approach, is effective in promoting intrinsic student motivation. In seeking evidence of the effectiveness of a learning model, the literature directs us to some key markers in the learner experience which indicate intrinsic motivation (Ames, 1992;
Dweck & Master, 2009; Maehr & Midgley, 1991; Martens et al., 2007; Valentín et al., 2013; Wentzel & Wigfield, 2009). These are: (a) sense of control and personal responsibility for learning; (b) identification of achievement, self-confidence and the acquisition of skills; (c) sense of achievement with peers in a team; (d) positive change in attitude to the use of ICT in the learning; (e) metacognitive consideration of learning; (f) sense of fun and enjoyment in the learning.

The emergent themes from the data are placed in reference to these key markers for intrinsic motivation surfaced in the literature as shown in Table 3.

The quantitative data from the Likert-style items (N = 265) also contribute to consideration here. For all pairs of items, correlations were positive and in general moderate (overall, in the range 0.13 to 0.33), and statistically highly significant (p < 0.01); the scale formed by the nine items has Cronbach’s alpha of 0.76. However, use of the scale scores is outside the scope of this paper. Of more relevance here is an analysis of how the data point to realisation of the key markers for motivation. Table 4 shows a tentative match between individual markers and the nine Likert statements, together with the percentage of students responding positively to (agreeing or strongly agreeing with) each statement.

### 9.1. Control and personal responsibility for learning

The issue of control in the learning and the student perception of who is driving the learning bears significantly on intrinsic motivation (Ames, 1992) and also touches the key element of autonomy as a requirement for intrinsic motivation identified in self-determination theory (Ryan & Deci, 2000). Participants in the workshops evidenced a growth in a sense of personal responsibility for learning with this emerging as a strong theme from the data and students made explicit references to personal responsibility for learning and understood that the learning model moved responsibility to them and to their colleagues. A typical comment from a student illustrates the point: ‘It pushes responsibility on you’; ‘You’re responsible for yourself and your own work.’ Participants were conscious of a deliberate shift in the control of the learning and the need for such a shift. As one student observed: ‘We need to

<table>
<thead>
<tr>
<th>Key markers for motivation</th>
<th>Emerging themes</th>
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<tbody>
<tr>
<td>A sense of control and personal responsibility for learning</td>
<td>Increased sense of personal responsibility for learning and improved propensity to self-directed learning</td>
</tr>
<tr>
<td>Identification of achievement and mastery of skills and self-confidence in the acquisition of skills</td>
<td>Indications of mastery and skills development, new confidence and indications of skills transference to the school and other learning contexts</td>
</tr>
<tr>
<td>A sense of achievement with peers in a team</td>
<td>Learner stated sense of achievement with peers in a team</td>
</tr>
<tr>
<td>Attitude to the use of ICT in the learning</td>
<td>Learner stated positive change in attitude to the use of ICT in the learning</td>
</tr>
<tr>
<td>Metacognitive consideration of learning</td>
<td>Learner stated metacognitive consideration of learning</td>
</tr>
<tr>
<td>A sense of fun and enjoyment in the learning</td>
<td>Learner stated sense of fun and enjoyment in the learning</td>
</tr>
</tbody>
</table>
control it ourselves and if we want to do well we have to learn it ourselves.’ In identifying this need in their learning they were unconsciously validating the Vygotskian maxim: ‘What children can do together today, they can do alone tomorrow’ (Vygotsky, 1978, p. 87). This declaration of independence in their learning is an important step for learners and a shift in the focus of their motivation from extrinsic to intrinsic (Meece, Anderman, & Anderman, 2006).

A high proportion of participants (82%) indicated a perceived gain in their sense of independence in their learning in post-activity questionnaires. The reported new sense of responsibility and independence was also accompanied by many references to gains in self-confidence.

### 9.2. Achievement, self-confidence and the mastery of skills

Intrinsic motivation is strongly linked with mastery goal orientation and a perception in the learner of having developed new skills or capability (Pintrich et al., 1994). New self-confidence, self-efficacy and a sense of achievement are also fruits of a rise in intrinsic motivation. Conversely, building learner confidence is vital in improving motivation (Bandura, 1977; Keller, 1987). The theme of new confidence emerged clearly from the data. The young people regularly referenced such a rise in confidence. One student referred to a newfound level of ability: ‘I can do more things if I put my mind to it.’ These mastery experiences have been shown to drive self-efficacy and motivation (Bandura, 1977). Students linked their general confidence with an improvement in communication skills. As one student put it: ‘I think I learned a lot about confidence and communicational skills.’ Students spoke of a new confidence with speaking in public, for example: ‘I knew that I had confidence now. I was able to talk in front of people I didn’t know and strangers and that I’d be

<table>
<thead>
<tr>
<th>Key markers</th>
<th>Likert question</th>
<th>Positive result</th>
</tr>
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<tbody>
<tr>
<td>A sense of control and personal responsibility for learning</td>
<td>Gain in my sense of independence in the learning?</td>
<td>82%</td>
</tr>
<tr>
<td>Identification of achievement and mastery of skills and self-confidence in the acquisition of skills</td>
<td>Improved my communication skills?</td>
<td>95.3%</td>
</tr>
<tr>
<td>A sense of achievement with peers in a team</td>
<td>Improved my attitude to working as part of a team?</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>Learn better in school as part of a team?</td>
<td>85%</td>
</tr>
<tr>
<td>Attitude to the use of ICT in the learning</td>
<td>Increased my confidence using technology?</td>
<td>90.5%</td>
</tr>
<tr>
<td>Metacognitive consideration of learning</td>
<td>College more achievable?</td>
<td>90% Post</td>
</tr>
<tr>
<td></td>
<td>Going to third level important?</td>
<td>90% Post</td>
</tr>
<tr>
<td></td>
<td>80% Pre</td>
<td></td>
</tr>
<tr>
<td>A sense of fun and enjoyment in the learning</td>
<td>Allowed me to make new friends?</td>
<td>93%</td>
</tr>
<tr>
<td></td>
<td>My experience on the programme?</td>
<td>99%</td>
</tr>
</tbody>
</table>

Table 4. Summary of quantitative data (Cronbach’s α = 0.76).
able to talk in front of anybody.’ It is notable that this perceived improvement in communication skills was indicated by 95.3% of participants in their post-activity questionnaires.

**9.3. Achievement with peers in a team**

Given that the learning experience was heavily team structured, it is, perhaps, not surprising that participants strongly referenced teamwork in their responses to questionnaires and in focus groups and a theme of achievement in the team and with peers was clearly emergent. The physical learning environment is designed to support team-based working and in itself is disruptive of the students’ perception of how they think about the learning. The development and working of the team is enabled in a physical environment designed to support teams. The positive responses of the students in the learning and the team effectiveness are clearly influenced by this team-customised learning space.

It is evident that the team experience in itself had a significant positive impact on the participants and in post-activity questionnaires 93% indicated a more positive disposition to teamwork after the workshop. Sceptics regarding group work and teamwork sometimes point to the danger of a student hiding within the team and group work not being appropriate for certain students (Galton & Hargreaves, 2009). Interestingly, after the experience 85% of participants believed that they could learn more in school through teamwork. In this study the participants saw that the individual was elevated rather than submerged in the team. One student observed: ‘I think that everyone was made to feel that they were important and needed.’ Within the teams there was strong evidence that an internal learning dynamic was facilitated and peer learning was evident consistent with the Vygotskian idea of learning from a ‘more able other’ (Vygotsky, 1978). As an example one student offered the observation:

> Cos you know the teachers are a lot smarter than you, at least with a friend he knows something more than you about one thing, you might know something more than him about another thing and you can teach him that while he teaches you.

Students also spoke of affirmation of their own ability and self-esteem through helping their peers. One student offered the personal insight: ‘I was like: Oh God, I feel really special now I’m passing my skills on to somebody else and that’s good.’ The students did not see participation in the team as a softer option than their normal classroom experience and believed that they were under pressure and had to work hard on the programme. Students felt compelled to contribute and engage and that they were under a measure of pressure to do so. This compulsion to contribute can be linked to the peer pressure within their team, the wish for their team to be successful and the energy stimulated through the social context of the learning experience. This combination gave rise to a high level of student engagement. As one participant remarked:

> you had a timeframe to have things completed by and if you hadn’t got it completed well then obviously your project or your video, whatever you were doing, wasn’t going to be as good as the other team.

It is clear that identification with the team experience and working with peers is integral to how the participants viewed the experience.
9.4. **Students’ attitude to ICT in their learning**

The programme shows evidence of improving the students’ attitude to technology in their learning, with 90.5% of participants indicating an increased confidence using technology. The sharing of ICT resources within the team is a key part of Bridge21. Each team of five participants had two PCs with access to the internet. The intent was to encourage sharing, collaboration and peer learning. The data show evidence of significant collaborative working and peer learning with and around the technology. As an example one participant observed:

I didn’t know much about computers and there was a person in my group that knew a lot about computers and she was showing me how to … like edit the music and all stuff like that.

This use of ICT in the team context was integral to the programme and the students saw the use of ICT in this context as part and parcel of the learning.

It is noteworthy that 50% of the students indicated that they did no school work on computers and 80% indicated that they did one hour or less a week of school work on computers. For this reason, comparisons with their use of ICT in school could be described as facile as their school environment in general treated the use of ICT as ancillary to the learning whereas the Bridge21 experience treated ICT as integral to the learning. The cohort of students also indicated that they made significant use of social media, email, gaming, downloading music, searching and multimedia in their personal, or what they saw as their ‘non-learning’, lives. Students identified this use of technology in their learning at Bridge21 as more relevant and aligned to their needs and, as one student said:

in Bridge21 we’re thinking ‘yeah this can help me’ because it’s computers and it’s working in teams and you’re focusing on modern things instead of focusing on things that, books that have been written two years previous or five years previous.

This sense of alignment of the learning with the reality of their lives, in this case through the use of ICT, can be taken as a marker for a lift in motivation.

9.5. **Metacognitive consideration of learning**

Evidence of metacognition, i.e. how students think about their learning, their strategies for learning, how their thinking is changing, their personal assessment of their own understanding and their sense of progress on their learning goals, is a significant indicator for intrinsic student motivation (Wirth & Perkins, 2008). There is evidence, from the data, of students thinking about and reappraising their learning. In open questions in the post-activity questionnaires, a significant number of participants made reference to thinking about how they learn. Additionally, this phenomenon of thinking and talking about their learning was a strongly emerging theme both from open questions in the questionnaires and from interviews. As an example, one participant spoke of reappraising the way they work:

I was real lazy at getting things done but now like I’d rather get it done and out of the way and look at different ways of doing it, rather than just the obvious.

There are indications that the intervention led to a positive re-evaluation of the participating students’ educational horizons, as was seen in their responses to a question on the importance to them of going to third level. Ninety per cent indicated that they
felt college was more achievable following their participation in the programme and 90% indicated that going to third level was important or very important to them post-activity as against 80% in pre-activity responses. Future Time Perspective is a psychological description of the future time span as conceptualised by the learner. The development of such a Future Time Perspective and the specificity of a goal such as accessing a third-level course have been shown to be important indicators of student motivation (de Volder & Lens, 1982; Simons, Vansteenkiste, Lens, & Lacante, 2004).

In focus groups, participants described how the experience of Bridge21 challenged their previous understanding of how they learned. For example, one participant spoke of a realisation that her peers could help with her learning:

Yeah before Bridge21 I thought I was a lone wolf … and I’d got my grades by myself and nobody else had told me what to do or told me how to do it … But then I realised that … ‘I need help in my education now’ not just from teachers but from other people in my class.

This reflection on learning can be seen as a personal affirmation of commitment to learning which is in essence evidential of intrinsic motivation.

9.6. A sense of fun and enjoyment in the learning and social connection

Some of the things that make learning enjoyable and fun are: interest, competence, curiosity, relatedness and autonomy (Husman & Lens, 1999; Kinchin, 2004) and, as Fink argues, the feelings of the student are central, rather than ancillary, to motivated learning (Fink, 2006). This link between learning and enjoyment was well made by one student:

In the Bridge21 you have a choice, either sit back and don’t speak up or, and you won’t have any fun, or speak up and learn new stuff and enjoy it.

It is noteworthy that students were surprised that learning could be fun and, as a student put it: ‘Learning can be fun instead of boring.’ Students contrasted their previous experience of learning with this approach to learning and highlighted the fun element:

I’d hit the books sometimes the night before a test ‘cos I’d be able to get it stuck into me head but while I was working as a team I’d be able to remember it more because we were having fun.

The sense of social connectedness in the learning is also important in growing motivation (Blatchford et al., 2003; Pyle, 1995) or belongingness as defined in self-determination theory (Ryan & Deci, 2000), and there is strong evidence in the data of students making friends and building social connections: ‘It was good to get the opportunity to mingle and mix and make loads of new friends.’ In post-questionnaires 93% of students saw the programme as important and effective in making friends. It is also clearly evident that the students thoroughly enjoyed the experience and this enjoyment influenced their perception of their learning in the process.

10. Conclusions

The evidence from the data indicates a positive effect on participants’ intrinsic motivation. The experience affected their perceptions of their relationship with
learning: their sense of responsibility for their learning, their sense of mastery of skills, how they can learn with and from their peers, their attitude to technology in their learning and their enjoyment of the learning experience. These results echoed the ideas espoused for motivational learning in Deci and Ryan’s self-determination and the social pedagogy described by Blatchford et al. (Blatchford et al., 2003; Ryan & Deci, 2000). The students also showed an increased inclination to think and talk about their personal learning and their learning goals. These emerging themes map directly onto the well-understood markers for improved intrinsic motivation. The focus group interviews conducted at a time lapse from six months to three years from their participation (depending on the student cohort) affirm the results from the data gathered at the end of the intervention and suggest a lasting positive memory of the programme and a significant residual effect on the student attitude to learning as a result of the programme. This study therefore indicates that the Bridge21 model of team-based, technology-mediated learning as applied in an out-of-school environment is effective in stimulating intrinsic learner motivation. The learning environment is designed through its layout and decor to promote team effectiveness and to stimulate the learner in a very different setting to their usual classroom context and it is clear that the learners are responding positively to this setting. The model through its structured teamwork approach offers a vehicle for the transfer of control of the learning from the teacher to the learner and in this facilitates the critical characteristics of learning necessary to encourage intrinsic motivation and in particular promote student responsibility for the learning. How this model could be applied against the formal curriculum and in an in-school context is the focus of current research (Johnston, Conneely, Murchan, & Tangney, 2012).

Note
1. In the Irish education system Year 4 of secondary school provides for a type of gap year that allows schools considerable freedom in the curriculum they cover.

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