

A motivation scaffold to improve the learning engagement of students

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Introduction

“Learning for life, not for grades”, is the eye-catching heading, of a recent report on the upgrading of an online education resource (Evans, 2014). The article went on to describe what many teachers know, but are seemingly powerless to change.

Schools are limited by a seemingly endless desire to subject children to frequent stressful tests, eliminating a sense of curiosity and engagement in exchange for instilling fear of failure. This means kids don't get the education they need to apply in their life, they just learn to get good at tests. No wonder they aren't interested. (Evans, 2014, para. 9).

Teachers who work with young adolescents know that motivating and maintaining their interest in classroom-based learning is a major challenge. Research such as that completed by the Centre for Mental Health in Schools (2008); Cole (2006), Cole, Mahar & Vindurampulle (2006), support this notion. The desire to tune into pre-prepared and packaged doses of information, however important, is not particularly high on the agenda of a 14-year-old young person whose body is pumping full of hormones and whose brain is so rattled by the latest round of synapses' pruning that they have little clue as to why they are here and what that person at the front of classroom is prattling on about. In fact one author was moved to write:

Many teachers believe they should receive hazardous duty pay for teaching adolescents. Adolescence is for many – adolescents, parents and teachers alike – a time of turmoil, rapid growth and learning, as well as shifting emotions and searching for personal and social identities. (Reilly, in Crawford, 2008, p. vi)

This study seeks to address this issue and is an examination of the use of a motivational scaffold to assist a cohort of Year Nine students to take greater responsibility for their learning through direct and authentic learning experiences outside the classroom.

Literature review

Many theorists have proposed ideas relating to motivation and learning. Although the literature covers a wide variety of these theories, this review focuses on recent engagement in learning literature, particularly as it relates to adolescents. The need for research in this area is detailed with reference to recent publications; and the ways in which students are likely to become engaged in, and take ownership of their learning, are explored. In this review specific attention is focused on engagement of adolescent learning, self-determination theory (SDT) and outdoor education (OE).

The relationship between learning and engagement may not be immediately evident in outdoor education literature, but a case is made in this paper for such a link existing and that outdoor education experiences provide a valuable context for students' learning. Outdoor education can be defined as direct and authentic experiences in outdoor environments. While it might be assumed that there will be learning engagement benefits from the personal development undergone through outdoor education programs (Hattie, Marsh, Hewison & Martin, 2010; McLeod & Allen-Craig, 2007; Martin & Fleming, 2010; Neill, 2008; Neill, & Richards, 1997), there is also a large amount of literature relating to the value of authentic and meaningful experiences leading to improved interest and engagement in learning (Blum, 2005; Cavanagh & Kennish, 2009; Gibbs & Poskitt, 2010; Murray, Mitchell, Gale, Edwards & Zyngier, 2004).

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With this in mind we are of the view, like Hewison and Martin (2010), that Outdoor Education (OE) theory has much to offer traditional schooling. Notions such as direct and authentic experiences, challenge by choice and facilitation combine to make a compelling case for the use of outdoor education methods in the classroom, particularly when dealing with young adolescents. Added to this, the Experience Fluctuation Model developed by Massimini and Carli (1988) and Lambert, Chapman, and Lurie (2013), and the Flow Theory from which it emerges (Csikszentmihalyi, 1988), both being important contributors to outdoor education theory, have received acknowledgement and usage in the wider educational research community (Cavanagh & Kennish, 2009; Fredricks, Blumenfeld & Paris, 2004; Gibbs & Poskitt, 2010). In learning engagement literature (e. g. Fredricks, et al, 2004), flow is described as another name for engagement within the affective dimension of learning engagement (Robinson, 2013). While this representation of flow is questioned within outdoor education literature (Pfab Houge, Hodge & Boyes, 2010; Priest & Gass, 2005; Stremba & Bisson, 2009) there is little doubt as to its significance in the learning, engagement and motivation debate.

Emerging from Flow Theory and The Experience Fluctuation Model is The Expectations Capabilities Model developed by Cavanagh and Kennish (2009). This model replaces the familiar outdoor education terms of skill and challenge with capabilities and expectations to allow for a more comfortable fit with learning engagement literature. Research based on this concept has found a positive correlation between the challenge and skill continuums in secondary school learning engagement (Harbaugh & Cavanagh, 2012).

In a recently completed doctoral thesis involving a study into the efficacy of an experiential education program in respect of learning engagement for Year Nine students, attention was drawn to the need to be mindful of motivation (Robinson, 2013) when considering learning. This is based on the premise that, without a desire to learn, the likelihood of students wanting to learn is quite remote. In the conclusion of this thesis Robinson (2013, p. 162) suggested a “trinary” (p. 161) that, as well as including the capacity to learn, and the conditions for learning, when considering learning engagement, the need or desire to learn was a third major component.

A review of some literature relating to the Self-determination Theory (SDT) of motivation (Deci, Vallerand, Pelletier & Ryan, 1991) suggests that it is when there is congruence between competence, relationships and autonomy that there is likely to

be intrinsic engagement in given learning tasks. Competence, in this context, relates to having the ‘know how’ to complete a given task, while relationships refers to satisfying connections with “peers, teachers and parents” (Borich and Tombari, 1996, pp. 33 & 34). Feelings of autonomy emerge when students are able “to initiate and regulate” (p. 34) their learning.

From this contextual background a recent article by Belland, Kim and Hannafin (2013) suggested the use of a six-fold scaffold for motivation and cognition. A scaffold, as used in this context, is a mechanism that supports growth and development and can be represented in different ways such as a coach, mentor, facilitator, teacher, or software; and guideline documents such as a rubric, worked example or worksheet (Hmelo-Silver, Duncan & Chinn, 2007). Belland et al. (2013) reviewed research on scaffolding and motivation to develop a framework to support the design of scaffolds that are likely to encourage motivation. The framework they posited included the following strategies: establish task value, promote mastery goals, promote belonging, promote emotional regulation, promote expectancy for success, and promote autonomy. Three of these strategies (Table 1.), link directly to the three components mooted in SDT, while the others are at least implied as well.

A number of theories on motivation and engagement were summarised by Martin (2012) and he claimed that motivation appeared to be linked to and precede engagement. Engagement was also found to increase using the instructional approach of Problem Based Learning (PBL) (Rotgams & Schmidt, 2011). This supported the notion that PBL can be a helpful medium to enhance the motivation for student engagement. Belland et al. (2013) proposed PBL to be a key instructional method for increasing motivation as it involved the use of authentic problems, group collaboration and self-directed learning. Added to this, when authentic tasks were used in the learning process, research demonstrated that task value and student motivation increased (Parsons & Ward, 2011). Motivation also increased when students were encouraged to solve real-life problems with the use of their own resourcefulness (Williams & Gonzalez-Hass, 2012). This supported the notion of self-directed learning giving the students greater motivation to continue.

However, there are practitioners and authors that express some concerns with the validity of PBL. It is often assumed that the authenticity associated with PBL automatically gives value to the learning process (Belland et al., 2013) when in fact, PBL requires greater planning and effort on

“*establish task value, promote mastery goals, .. belonging, ... emotional regulation, ... expectancy for success, and ... autonomy*”

the part of the teacher and assumes that students already have the level of organisation and reflection skills to cope with self-directed learning (Williams & Gonzalez-Hass, 2012). Furthermore, the PBL environment is not minimally guided, and requires scaffolding to support self-directed learning. Scaffolding allows learners to be involved in complex problem solving which can be beyond the student's capacity and experience base (Hmelo-Silver, et al., 2007).

“A mastery goal orientation will encourage students to collaborate ... and push each other ... [and] promote a deeper level of ... engagement ... than performance goals”

Table 1: SDT and Motivation Scaffold comparison

Self-determination Theory (Deci, et al., 1991)	Motivation Scaffold (Belland, et al., 2013)
	establish task value
competence	promote mastery goals
relationships	promote belonging
	promote emotion regulation
	promote expectancy of success
autonomy	promote autonomy

Scaffold design suggestions

The following are scaffold design suggestions from the six-fold motivation scaffold proposed by Belland et al. (2013).

1. Establish task value

Promoting task value is an important element for scaffold design as the perceived value of the task can be linked to intrinsic motivation (Belland et al., 2013). Two instructional strategies that establish task value are fostering interest and attainment value. Firstly, interest that is initiated by environmental features is known as situational interest (Hidi, 2006). A knowledge and understanding of what would attract students to an activity can generate situational interest (Ainley, 2012). Such interest can be triggered by driving questions that establish curiosity or cognitive conflict (Belland et al., 2013). For situational interest to be maintained, knowledge needs to be stored and understood, increasing the value of the task (Renninger & Hidi, 2011). The features of the activity are no longer essential, but opportunities for reengagement are critical (Ainley, 2012). Starting with situational interest there is

transition from emotional to cognitive components as situational interest develops into individual interest. Individual interest involves an increase in positive feelings, knowledge and value in the task, and can include a predisposition to the interest domain (Hidi, 2006). When individual interest is well developed, reengagement in the activity occurs which characterises the notion of engagement (Ainley, 2012). Therefore situational interest is an important component of any scaffold design.

The second strategy for achieving task value is attainment value. This is best achieved by outlining the significance of the task, providing reasons for doing the task and why it is relevant to the current situation, particularly when the task is uninteresting (Reeve & Halusic, 2009). Engagement in the task is more likely, when the task is perceived to have value, as opposed to the student's belief in his/her ability to achieve the task (Wigfield & Eccles, 2000).

In order to promote task value some suggestions for scaffold design would be:

- a. To expose the students to expert modelling where professional practise is demonstrated (Hmelo-Silver et al., 2007).
- b. To ask the student to reflect on performance and to record personal insights which would help him/her better comprehend the realities of the task (Belland et al., 2013).

2. Promoting mastery goals

Belland et al. (2013) promotes four strategies to enhance mastery:- Short-term goals, informational feedback, co-operation and rational goals. Miller and Brickman (2004) found engagement to be enhanced when a student regulated self and divided future goals into proximal tasks, which could be achieved in the short term. A scaffold could be developed in the form of a worksheet with prompts, rather than the student being asked to develop a full scale report about a problem.

Promoting informational feedback is helpful and can be scaffolded in various ways. Demonstrating and describing capabilities, which match various levels of achievement, will promote progress toward competence rather than benchmarking performance against other students. Feedback can be used to encourage a student to higher levels of competence by assessing his/her work in a substantive way, recognising various levels of progress. However, continual focus on the overall problem is still important as performance goals can be a distraction and lead to disengagement (Belland et al., 2013).

A mastery goal orientation will encourage students to collaborate on learning tasks and push each other for explanations and understanding

to achieve rational goals, which will promote a deeper level of processing and engagement than performance goals could engender (Pugh, Linnenbrink-Garcia, Kosskey, Stewart, & Manzey, 2009).

3. Promote belonging

A scaffold can promote belonging with the use of strategies such as shared goals, accommodating social goals, and the co-construction of standards with participants. This is best facilitated with group work and encouraging the development of a social contract (Martin, Cashel, Wagstaff, & Breunig, 2006). Although students work in groups, it is recognized that individuals still have different interests and personal goals; therefore it is important to use a scaffold which outlines different aspects of the problem, allowing for group members to choose common objectives (Belland et al., 2013). However, student expectations should be established first to have any chance of forming a consensus on what to solve (Belland et al., 2013). When group members are aware of the expectations of others, they are more likely to share goals, invoking social responsibility. Strategies that accommodate social responsibility are those which remind group members of the greater capacity to be found in group achievement and importance of task attainment value, even if it is just for some members of the group (Deci & Ryan, 2000). Sharing the construction of standards and benchmarks for assessment with students increases incentive and motivation for students to participate in the activity. It encourages students to take ownership of the assessment process, but not without expert support and guidance (Reeve & Halusic, 2009).

4. Promote emotion regulation

An emotion can be described as a sequence of events beginning with a relevant situation, which is evaluated by an individual and then gives rise to a response. Emotions can have helpful or inhibiting effects, thus it is important for scaffold design to offer opportunity to regulate negative emotions (Belland et al., 2013; Gross & Thompson, 2006). Suggested strategies for emotion regulation start with selecting a situation, which is likely to give the expected response, and then if needed, modifying the situation to reduce intensity. Changing an emotion with a distraction or perhaps modulating a response with exercise, deep breathing or medication can also redirect attention. However, this is more temporary in nature and experimental studies have identified this approach as suppressive, showing that negative emotions are likely to increase (Gross, 2014). In controllable

situations, Belland et al. (2013) suggest a scaffold can be designed to direct a student to constructive responses where negative emotions are viewed as formative feedback to causal structure. On the other hand reappraisal of the situation can be useful to bring about a cognitive change where the situation is viewed differently and the emotional response is changed. Gross (2014) has reviewed a number of studies which have shown that reappraisal does not impact the nervous system, memory or relationships with others and thus would be an important emotion-regulation strategy for a scaffold. Reappraisal can be external (e. g. the outcome can be viewed as good although it was very different to what was expected) or internal (e. g. feelings of apprehension can be viewed as a way to maintain a cautious approach).

5. Promote expectancy for success

Belland et al. (2013) point out that motivation will not be optimised by simply, promoting expectancy. It is more likely expectancy for success will be greater if a scaffold offers some strategies for making the achievement of the task believable.

One suggested strategy is to use behavioural modelling (Moos & Azevedo, 2009). Some programs have demonstrated the effective use of students who have just completed the task to be used as peer models to those beginning the task (Wigfield, Eccles, & Rodriguez, 1998). Another strategy is to encourage students to regularly reflect about progressive outcomes and make the necessary adjustments to subsequent attempts based on what did or did not work (Belland et al., 2013).

6. Promote autonomy

The role of the scaffold is to support success; however it can be constrictive to the point where there is a significant reduction in choice. This could impact the aspect of autonomy to the extent that motivation would decrease too much for students to engage (Rotgams & Schmidt, 2011). Therefore, it is important to incorporate into the design of a scaffold, options that provide opportunity for students to have ownership over the learning task. Scaffolds can be very useful for outlining and detailing different aspects of an overall problem, which could provide a choice for students to select a learning task in which they are interested (Belland et al., 2013). Students could choose from a list of processes that are personally relevant and reliable (Katz & Assor, 2006). For example, time management could be supported by short term time-lines while self-evaluation could be scaffolded by a rubric which would allow for self-assessment (Loyens, Magda, & Rikers, 2008).

“Strategies that accommodate social responsibility ... remind group members of the greater capacity to be found in group achievement and importance of task attainment value, even if it is just for some members of the group”

Figure 1: Motivation Scaffold visual planning tool

Theme	Day: _____
Year 9 L4L Urban Learning Challenge	<i>Fill in the boxes below with comments about your upcoming trip to the city</i>
What is the purpose of this trip? (big picture)	
What do I/we want to achieve today? (learning intentions)	
How will I/we ensure that everyone feels part of the group today? (belonging)	
What will I/we do to ensure that everyone in the group feels positive about the outcomes achieved for the day? (emotions)	
How can we ensure we will succeed? (success criteria)	
What am I/we able to contribute to the trip/group/learning today? (autonomy)	Member 1:
	Member 2:
	Member 3:
	Member 4:
	Member 5:

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Methodology

Out of the review of literature relating to motivation and learning engagement a motivational scaffold in the form of a visual planning tool (see Figure 1) was developed to help students plan for and evaluate their learning. In this study 15 groups (four to five students in a group) of Year 9 students, participating in a PBL project over four day visits to the Melbourne CBD, used this tool. Before each visit, the groups were asked to collectively complete the planning tool by thinking about and

responding to each of the six statements in the tool when planning for the trip to the city. Each of these statements reflected one of the six components of the motivation scaffold.

After each trip to the city each group was given time to evaluate the planning tool using their planning sheet. These data were not recorded, but the activity was intended to be part of the reflection process for each of the trips to the city. The activity also provided the students with an opportunity to consider how they could improve the learning

Table 2: Mean (μ) and standard deviation (σ) for the six scaffold components (n=60)

scaffold component	μ	σ
establish task value	4.02	0.62
promote mastery goals	3.97	0.73
promote belonging	3.80	0.95
promote emotion regulation	3.73	1.09
promote expectancy of success	3.75	0.85
promote autonomy	3.70	1.01

Figure 2: Establish task value: What is the purpose of this trip? (N=60)

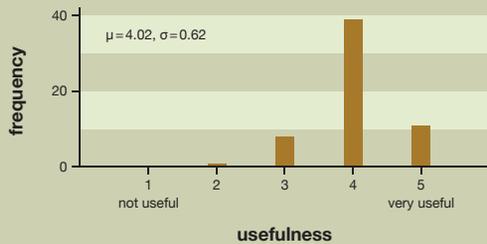


Figure 3: Promote mastery goals: What do I/we want to achieve today? (N=60)

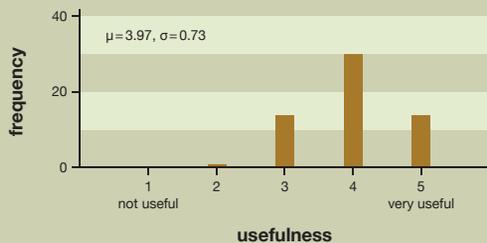


Figure 4: Promote belonging: How will we ensure our group works well together (N=60)

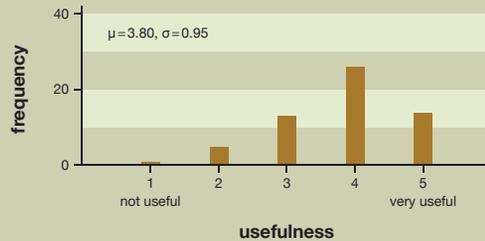


Figure 5: Promote emotion regulation: If I see or feel there are issues within our group how will we settle them? (N=60)

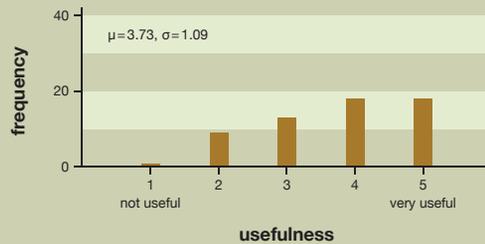
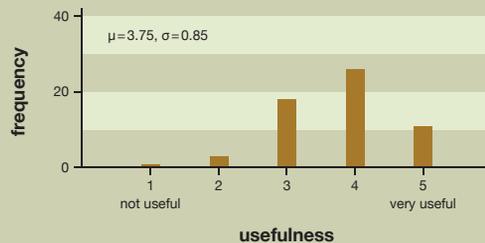


Figure 6: Promote expectancy of success: How can we ensure we will succeed? (N=60)



“Even though ... use of the scaffold was mandatory, do you feel ... it gave you more responsibility for your learning?”

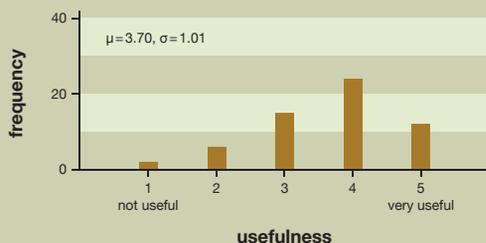
outcomes of their next city visit.

At the conclusion of the fourth visit to the city students were asked to complete an online questionnaire designed to elicit responses relating to the value of the visual planning tool in impacting their engagement levels with the PBL project. Included in this survey were questions relating to the six scaffold components, the results of which

are included in the graphs below. As well, students were asked to comment on the value of the scaffold for ownership of their personal learning, by answering the question: “Even though the use of the scaffold was mandatory, do you feel that it gave you more responsibility for your learning?”.

In total, 60 students completed the online survey, with the quantitative data from their

Figure 7: Promote autonomy: What was/were I/we able to contribute to the trip/group/learning today? (N=60)



responses reported in tabular and graphic form below. These data are based on a one to five point Likert Scale, with 1 referring to being *not useful* and 5 *very useful*. Qualitative data are reported in the form of respondent comments that are either supportive or not supportive of the use of the scaffold for their learning engagement.

Results

The quantitative data, summarised in Table 2 and the subsequent charts below, indicate that students were positive about the value of the scaffold for improved engagement and participation in learning. From this data it would appear that students found the scaffold to be a very useful tool to improve their learning. This was particularly true for the items, ‘establish task value’ and ‘promote mastery goals’, with most of the cohort reporting that use of the scaffold was a helpful tool to help with planning and maintaining focus during the trips to the city.

Table 2. Mean (μ) and Standard Deviation (σ) for the six scaffold components (n=60)

The distribution of the responses is of some interest. While the first two scaffold component responses are more tightly clustered, those for the remaining variables are more spread out indicating a greater variance of student opinion for the latter variables.

This variance of opinion is supported from the qualitative data collected. Student comments on the value of the scaffold to assist them with ownership of their learning varied from a simple ‘yes’ or ‘no’, to quite detailed answers.

Some students indicated that they were neutral to the value of the scaffold.

Only to an extent. This was because it gave a bit of responsibility towards certain circumstances.

and, *Only a bit to get organised, but that’s all.*

Responses such as these seem to suggest that for some students at least, the process of completing the scaffold was simply another thing they had to do before they went on their city trip. About 10% of the 60 responses would fit into this category.

Thirty of the 60 respondents replied that the scaffold was of definite benefit to help them engage in their trips to the city. Sample responses of those who were positive about the use of the scaffold included:

Yes, because we were the ones in control of our learning in this situation, so it was up to us to take the initiative and responsibility to stay focused on the goal and the scaffolds helped me keep on track with where I was going.

and,

Yes, it placed responsibility on us. It allowed us to see our aims and goals for each day.

Just over a third of the students were of the view that the scaffold did not contribute to their engagement in learning. Some of the responses from this cohort included:

No, because I think it would have been the same without it.

and,

No because something might be a surprise and not planned and it might be good for the assignment.

While for some students this may be true, the wording of the question does leave room for those who felt they were already responsible for their learning to answer in the negative. Also, for some of the students, various components of the scaffold were of more use than other components. This is shown in the wider distribution of responses in latter sections of the tool. This suggests that teachers may have to provide more focused facilitation of the groups while they complete the scaffold and before they make the trips to the city in the ‘promote emotion regulation’ and ‘promote autonomy’ components.

While it is obvious from the data represented in the above charts that the majority of students found the instrument to be useful as a planning tool for trips outside of the classroom. This conclusion does need to be treated with some caution.

Acknowledgement is made here that the students who completed the survey were in one of the author’s classes, which can impact the reliability of the data (Briggs, 1986; Zink, 2005). Obviously, further research is required to tease out more

“it would appear that students found the scaffold to be a very useful tool to improve their learning”

information about the usefulness of the scaffold and the factors that impact its implementation.

The teachers involved in the project were positive about the use of the scaffold. When asked at the conclusion of the project about the impact of the scaffold teachers were generally positive and commented:

Personally, I think the scaffold did enable the students to focus more closely on their area of study (PBL). While this was not obvious in all the presentations, the overall presentations were of a higher standard than in previous years and I am of the view that the scaffold was one of, if not the main, contributing factors, for this.

Also, some teachers thought the scaffold was of use to them as well as the students:

Though there are still definitely some areas for improvement, I believe that students who used the scaffold performed significantly better than previous years and there were a number of reasons for that improvement. Firstly, I think that we have had a significantly better idea of what we were doing and why we were doing it. In other words the scaffolding was both necessary for teachers and students. Secondly, I think the engagement scaffold provided students with a discussion point and enabled them to focus on the general idea better.

Conclusion

It is evident from the literature reviewed in this study that for many adolescents, the arousal and maintenance of interest and motivation in school-based learning is necessary. This study supports the idea that, for a significant number of students, the use of a visual planning tool is effective in increasing levels of student engagement and student ownership of learning in a PBL context.

While this study uses a small sample from one school, and is based on trips outside of the classroom, we believe the results of this initial study have provided enough evidence to suggest that this method of improving motivation and engagement is worthy of consideration by teachers who are seeking ways to more effectively engage their students in learning. Further research needs to be carried out to determine the value of such an instrument for improving motivation and engagement in more traditional classroom settings.

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