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Embedding peer support as a core learning skill in higher education

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Abstract

Information, digital and academic literacy skills are more important than ever as the nature of global information streams becomes more complex and increasingly online. New methods are needed to ensure that students are taught to identify, use and critically evaluate this complex information myriad during their education and in their future careers. Peer assisted learning is one method that has been shown to help, and previous research in the field of peer support has indicated that the interaction between students at different levels enhances a first-year student's successful transition into higher education (HE).

In 2016, a peer support scheme was introduced at the Institute of Technology Tallaght (ITT Dublin) as collaboration between the Department of Mechanical Engineering and the library. Initial evaluation of the programme showed that some students respond positively to the inclusion of peer support within an academic module. We also found that peer tutors have a critical role in the support of a first-year student's learning and their transition into higher education. They act as role models and guides and can help students form the essential linkages between the different resources they will need to be successful in higher education and beyond. An attractive social strand to the programme can act as a critical motivator for students. Further research is needed to identify the essential elements required.

Keywords

peer support; information literacy; higher education; engineering students; Ireland

1. Introduction

The purpose of the peer assisted learning programme described in this paper was to help students in building the academic, lifelong learning and literacy skills that are essential as they develop socially, academically and professionally. The programme was constructed around a first year experience that sought to enhance the engagement and motivation of students and peer tutors while enhancing their understanding of what it means to be an engineer in the 21st century (Sultan et al., 2013; Tariq, 2005).

The two novel components of this project were the use of peer tutors in a first semester module that focused on the development of a range of key skills in which peer tutors can pass on the benefit of their experience and on the parallel development of an Engineering Society that embedded a social element into the programme helping the first year students develop a sense of belonging to their new programme.

2. Background / institutional context

The Institute of Technology Tallaght (ITT Dublin) is the only third level academic institution in South Dublin, Republic of Ireland, providing undergraduate and postgraduate programmes to a diverse and multi-cultural range of learners. The Institute has a student population of over 5,195 students (full-time and part-time) offering qualifications from Higher Certificate to Masters and Doctorate level across a wide range of programmes in Business, Humanities, Engineering, Science and Computing. The student cohort at ITT Dublin is characterised by many non-traditional students - students from different social classes, mature students, and students from different ethnic backgrounds. Many of these students are trying to balance learning challenges with demanding life circumstances.

The Institute has established a wide number of supports to enhance the teaching and learning process, facilitate flexible provision and improve student engagement. The institutional approach to peer support is encompassed in a student-centred instructional strategy for developing critical thinking and core academic skills and this is reflected in the Institute's Strategic Plan 2009-2014 (Institute of Technology Tallaght, 2009) and The Learning, Teaching & Assessment Strategy (Institute of Technology Tallaght, 2011) which themselves are informed by The National Strategy for Higher Education to 2030 (Department of Education and Skills, 2011). This national strategy proposes that higher education (HE) should explicitly address core skills - self-directed learning, critical & analytical thinking, problem solving, reflective practice, IL - required for effective engagement in society and in the workplace. In particular, that 'Higher Education Institutions should prepare first-year students better for their learning experience, so that they can engage with it more successfully' (Department of Education and Skills, 2011, p.18).

Peer support is one approach that has been shown to enhance the transfer of a wide range of academic and generic skills. This is supported by a recent survey amongst undergraduates at four Irish HE institutions to capture student experience on transitioning, (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015); survey respondents indicated that a greater use of HE mentors would better prepare students for the transition to third level education.

Over the coming years, the Dublin Institute of Technology (DIT), ITT Dublin and the Institute of Technology Blanchardstown will merge to form a new Technological University; one of the largest providers of third level education in the state. Peer support has been identified as one of the core

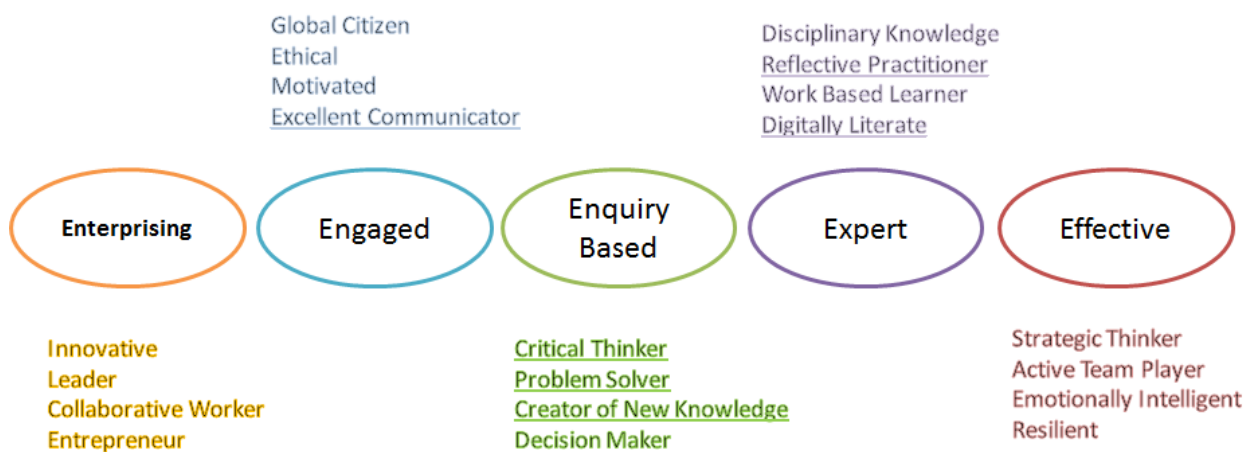
themes that could enhance the first year experience in this new higher educational institution and emphasis will be placed on practices that will improve student acquisition of core academic skills, facilitate transition and increase student retention.

3. Literature Review

Students entering higher education are facing a more complex, technological and increasingly online world. At the same time, it is generally accepted that student’s traditional literacy skills are declining. Many students in HE struggle to identify, critically evaluate and effectively use valid sources of information, and are deficient in core literacy skills (Lahlafi and Rushton, 2015; Ross et al., 2016). This crucial lack of skills and the information ‘fog’ that faces our first year students as they enter higher education puts their future careers at risk and limits their ability to participate in society as an active citizen.

In order to tackle the complexity and range of skills required to tackle this information ‘fog’, Beard & Dale (2010) argue that IL should be seen as a component of broader academic literacies. In fact, more HE institutes now see this wider range of academic literacies under the general banner of graduate attributes (Figure 1) and include a range of strategies and fundamental skills including: traditional literacy skills, information and digital literacy, critical thinking, personal reflection skills and communication skills, that can help them cut through the information complexity and fog of the modern world (Adams, 2016; Beard and Dale, 2010; Ross et al., 2016).

Figure 1: Graduate Attributes as defined by Dublin Institute of Technology* (DIT 2017).



*Underlined components are those that are taught as part of the Learning to Learn module at the Institute of Technology at Tallaght.

Often it is not enough for a library service to provide resources to help students assimilate these skills over the first years of their degree programme. It is essential that the resources developed by the literacy experts are integrated into a student’s academic programme and that the assessment of these skills is integrated into the relevant modules.

Russell et al. (2013) discuss the reusable learning objects developed at ITT Dublin library covering IL and core academic competencies which have been integrated into a range of academic modules. As these resources have been integrated into the first year *Learning to Learn* module at ITT Dublin it has been necessary to explore new ways of signposting the importance of these skills to first year students (Ryder 2014). Peer assisted learning (PAL) has been shown to be beneficial in this respect. The target of this research has been to develop a team of literacy and technological experts working together to develop a PAL programme that helps first year students develop the required academic literacy skills or graduate attributes essential to their future careers.

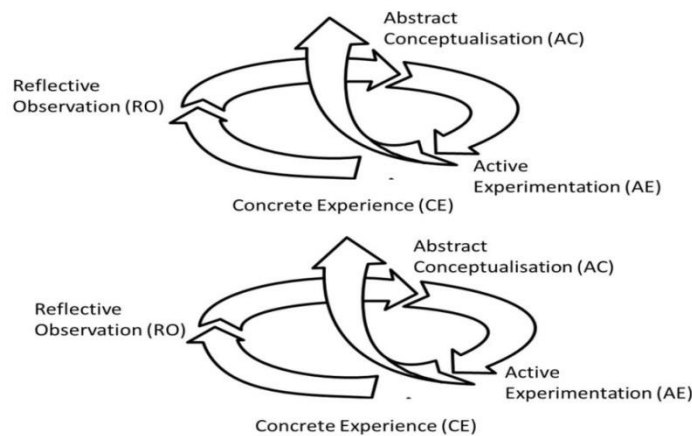
There are many instances of PAL active nationally and internationally but they share common definitions.

“Peer assisted learning sessions provide a learning environment where students are supported to construct knowledge from past experiences and previous knowledge. In this way, peer assisted learning is based on the principles of constructivism in a social context” (Ginty and Harding, 2014, p41).

Peer learning has been implemented on a diverse continuum of scenarios from the one to many interaction between students in concurrent years such as PAL or peer assisted study session (PASS) to the more intimate one-on-one forms of peer mentoring (PM) and peer counselling (PC) (Ody and Carey, 2013; Black and Mackenzie, 2008; Falchikov, 2012). More recently the increased usage of online learning environments has seen an increase in the use of online peer support (Keenan, 2014; Devine and Jolly, 2011; Capstick, 2004, Capstick et al.,2004).

Peer learning has its foundation in the theories of constructivism and social constructivism proposed by Piaget and Vygotsky among others (Kolb, 1984; Kolb and Kolb, 2008; Kozulin et al., 2003). At the heart of the social constructivism theory is the process of 'active discussion and collaborative learning' that is the defining feature of peer learning (Capstick 2004; Capstick et al., 2004). Peer learning allows students to engage in a discussion regarding learning approaches that can lead to a form of creative destruction in which meta-cognitive strategies are made fluid and then adapted or replaced leading to more effective strategies in a learning spiral supported by a more capable peer, a process informed by the theories of Kolb's experiential learning theory and the zone of proximal development, as proposed by Vygotsky (Figure 2) (Kolb, 1984; Flavell, 1979; Kozulin et al., 2003; Lai, 2011). The skills developed within this relationship are not limited to academic skills but the whole spectrum of meta-cognitive, communication, and transferable skills required as a student progresses through their academic and professional careers (Kozulin et al., 2003).

Figure 2: Kolb's learning cycle (Kolb, 1984).

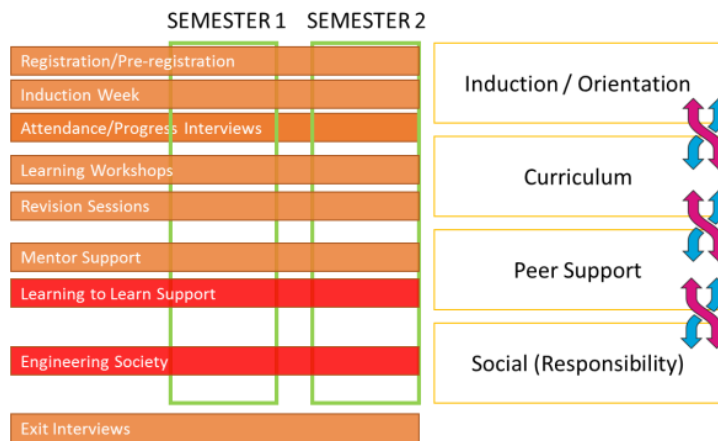


4. Design and implementation

The design of the PAL initiative described in this report was initially informed by national and international initiatives described in the literature, primarily those initiatives implemented by Bournemouth University and Dublin Institute of Technology (DIT) (Black and Mackenzie, 2008; Capstick, 2004; Capstick et al., 2004; Diggins et al., 2013; Gabaudan and González, 2009; Green, 2011; Topping, 2005). A number of retention models include a social dimension. It is therefore essential that as transition initiatives are designed that they place at their heart a programme that encourages social interaction between students, staff and faculty, encourages students to create a sense of identification and belonging to the new group (Briggs, et al. 2012; Tinto and Cullen, 1975; Tinto, 1988; Crosling, 2009; Morgan, 2011). The aim of this project therefore sought to enhance the transition of first year students through the use of a peer support programme during the *Learning to Learn* module that already focused on the development of a range of academic literacy skills.

Retention and transition initiatives used within the Department of Mechanical Engineering have been implemented across a number of layers: at induction / orientation level; curriculum level; peer support level; and the social / social responsibility level (Figure 3). The focus of this project was on the peer support in the *Learning to Learn* module and the development of the Engineering Society to supplement the existing initiatives already used in the department.

Figure 3: The four levels that make up the Mechanical Engineering PAL Scheme, including initiatives used during the extended induction process.



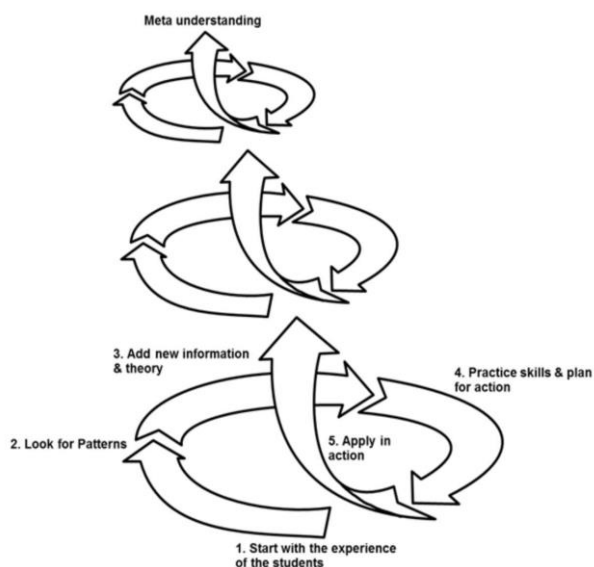
Peer support is a new departure for the Mechanical Engineering Department at ITT Dublin and so for the first year of this scheme the focus was on developing a peer assisted learning (PAL) programme consisting of two major strands:

1. A PAL programme, developed in collaboration between the Department of Mechanical Engineering and the library, supporting a first semester module that helps students acquire study and literacy skills essential for their journey through higher education.
2. An enhanced social programme supported through the establishment of an Engineering Society.

The Engineering Learning Support Unit (ELSU), an early innovation at the Institute, sought to enhance student retention within the School of Engineering (O'Sullivan et al., 2006). Layers of supports were arranged around ELSU that started as soon as a student accepted a place at the Institute and included pre-registration supports; registration, induction and orientation supports aimed at helping the student feel part of the School's learning community as early as possible and therefore smoothing their transition into the Institute.

This model of extended induction has been used for a number of years and has become locally known as spiralling induction. It involves induction activities extending beyond the first week and underpinned by interviews with students during induction week and at key times in the first semester. These interviews help students focus on their progress as they transition from second to third level and help them monitor the development of their learning skills or meta-understanding (Figure 4).

Figure 4: Spiralling induction



The peer tutors for ITT Dublin's new scheme were recruited once funding had been allocated through the Learning and Teaching Fellowship programme being run jointly between ITT Dublin, Dublin Institute of Technology and The Institute of Technology Blanchardstown. Students were approached in week 3 of the September semester and initial meetings to discuss how the scheme would work took place in weeks 4 and 5. The first PAL sessions were run in week 5.

No formal training was given to the peer tutors, but the peer tutors and class lecturer met for one hour per week to discuss the upcoming unit of learning and any issue that might arise in the classroom. Students were encouraged to use an online journal to record thoughts about their peer experience as the semester progressed.

Table 1: Learning outcomes, curriculum and assessment details for the Learning to Learn module

Learning Outcomes	Curriculum	Assessment
Identify and engage in the learning process / create a personal learning plan	Stage 1: Personal Aspirations, Motivations and Engagement. Reflective questions: why choose engineering? where do you see yourself in 5 years?	Reflective Diary (40%) Multiple Choice Quizzes (20%)
Study effectively as an independent learner / work collaboratively in a team	Aim: to stimulate students to visualise where their degree fits into their future, motivate them to play a more active role in their education and their learning community.	Group Project (40%)
Manage time efficiently - plan and organise learning tasks	Stage 2: Study skills and meta-cognitive strategies. Learning styles Questionnaire (Felder 1988), Study Planning, note taking methods and organisation (Cornell University 2015), Scan Question, Read, Recite, Review (SQ3R) method (Gunning 2002), mind-mapping techniques (Buzan 2006), laboratory approaches and writing lab reports. Digital literacy: find and critically analyse technical information.	
Use critical thinking / analytical skills to solve a variety of problems		
Recognise importance of academic integrity, avoid plagiarism through good practice and referencing	Stage 3: Group Project: Trebuchet design and build. Group work, Information identification, critical analysis, design, build and test. Report writing, poster design and communication. Plagiarism and referencing. Stage 4: Revision Strategies Revision planning, exam preparation, developing confidence through practice.	

The peer support interaction was designed around the *Learning to Learn at Third Level* module delivered to first-year students. The module was developed to facilitate a smooth transition into HE and therefore enhance retention. The module covers a range of essential, personal, academic and literacy skills required to be a successful student (listed in Table 1).

Each skill or strategy was treated as a unit of learning, with one unit of learning delivered over 4 hours each week. Of this time, three hours were spent in the classroom with the tutor and one hour was spent in the computer lab with students, peer tutors and class tutor.

In order to enhance vertical integration of the transition activities, and where appropriate, the learning units used examples from the other first year modules in a timely fashion. For example, for the unit on how to conduct a lab and how to write a lab report, students were asked to complete an exercise that forms part of the Engineering Science module and had not yet been done by the

students. Once the exercise had been completed students were given hand-outs on how to write a lab report, how to write the conclusions for a lab report, and a marking rubric for a lab report. An in-class discussion was then facilitated between the students, peer students and class tutor on the best way to write the lab report. In this way the skills taught to students were immediately useful and could be tried out on real assessment tasks.

The work on the development of learning environments to support the development of metacognitive strategies was done in collaboration with the library at ITT Dublin. Staff from the library in ITT Dublin are actively developing a range of resources to enhance the digital literacy skills of students as they transition through college: reusable learning objects, IL frameworks and assessment guidelines (Russell et al., 2013; Russell, 2014a). As part of this work, the library at ITT Dublin has produced a 3-level information / digital literacy framework to assist the development of its IL programmes. For each level of the framework, an indicative set of learning outcomes has been developed, including relevant assessment and evaluation techniques.

While the principal aim of the project was to develop peer interactions between first year students and second year peer tutors, the secondary aim was to develop a more engaging social programme that brought together engineering students outside of their academic programmes. At the start of the peer support programme a group of final year engineering students who had expressed an interest in starting an engineering society were approached. The principal goal of the society had always been to develop the social aspect of the engineering programmes, so a range of social events were planned including a 3D printing and pizza night, go-karting and other activities. However, as the academic year progressed, the society began to include activities that reached beyond the department and into society. The society started collaborating with other clubs and societies using resources such as the 3D printer, pub quizzes to raise money for charity and working in local primary schools on projects including the establishment of a school garden. The society and the team running the society went on to win a number of awards at local and national level. The success of the society attracted a large number of first year students in the second semester and became an essential part of the programme culture.

5. Evaluation, results & implications of the study

Evaluation of the project focused primarily on the results of questionnaire responses from the students participating in the scheme and questionnaire responses from the peer tutors.

5.1 The first year student evaluation questionnaire

The questionnaire (Figure 5) given to the first year students at the end of the first semester focused on four questions:

1. The elements of the *Learning to Learn* programme, students were asked to rate each of the main elements of the programme on a scale from 1 'I did not find the activity useful or relevant to my course' to 5 'I found the activity very useful and relevant to my course' (see Figure 5, 6 & 7).
2. Their opinions of the peer programme.
3. Their opinions of the social elements of the programme
4. Whether they would be interested in being a peer tutor next year.

Figure 5: Questions from the first year student questionnaire

1. Rate each of the following in terms of importance or usefulness to you

	Unimportant or not useful	not really important or useful	important or usefully	very important or useful	extremely useful or important
Induction week activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Study plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Why engineering/5 year plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning styles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lab reports/lab skills and writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paragraph/Literature Review (Safety)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Library Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research/Referencing/Plagiarism Library Quizzes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Line Launcher project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The poster show	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The report (report writing/mindmaps/formatting the report)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exam questions and revision/revision plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The peer support network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Specifically regarding the process of writing the Literature Review, can you describe how you felt about the exercise at the start, did you find the advice during the class helpful, did the peer tutors help you? What support do you need in academic writing now?

3. One thing that you would keep in the module? why?

4. One thing that you would add to the module? why?

5. One thing that you would remove from the module? why?

6. Did you find the peer assisted learning activities useful? why?

7. What did you like about the Peer Assisted Learning Activities?

8. Did you participate in the engineering society? why?

9. Would you consider becoming a Peer Tutor next year? If yes please leave your email address here.

The PAL scheme carried out in the first semester was particularly successful. The combination of in-class peer support, real life engineering problems and daytime social activities proved very popular. One possible interpretation of these results could be that those activities that the students felt were most relevant to their studies scored highly, including the group trebuchet project, and the digital literacy e-learning modules on critical thinking, research and plagiarism. Activities such as the note taking, SQ3R, the library skills seminar and the learning styles activities scored lowest (Figure 6). Possible explanations include that students failed to see the relevance of these activities to their current learning needs or that they felt that their current learning strategies were sufficient for their current learning needs. This could indicate in turn that students are exhibiting a strategic approach to their study skills development, suggesting that the peer learning model proposed by Topping & Elhy could hold promise as a development framework that helps students move beyond surface level rote learning to deeper modes of self-directed learning with the guidance of a more competent peer (Topping, 2005).

Figure 6: Ratings given to the different Learning to Learn activities by first year students



Figure 7: Selected responses to the first year student questionnaire

Did you find the peer assisted learning activities useful?
Yes, because it helps students who are struggling with their subject to come up with an idea or ideas of how to solve a problem or how to get the answers to the questions
Yes, it was great to get to know each other and to integrate with others in the class
Yes, it helped me understand the college system better and what was in store for me in the future of the course. The peers were very helpful in answering any questions that the class had about the course and its modules
Yes, it was good as it gave us more help from people who had just gone through the same thing.
Yes, you can find the answers to questions without necessarily having to go to a lecturer

All respondents felt that the PAL programme contributed positively to their learning experience in the first semester (Figure 7). Reasons given included that it helped them get to know each other and helped them mix with students from other years and gave them an alternative channel to get

help other than the lecturer of the module. One respondent felt that having second year peer tutors was very useful as they had just completed the tasks that the first years were currently doing (Figure 10).

Of the 35 students in the class, 21 answered the questionnaire, and 5 indicated that they would be interested in becoming a peer tutor next year. Many of the reasons given for declining stated that they did not feel that they could do better than the current peer tutors; others felt that they would not be able to spare the time given their family, work or learning commitments.

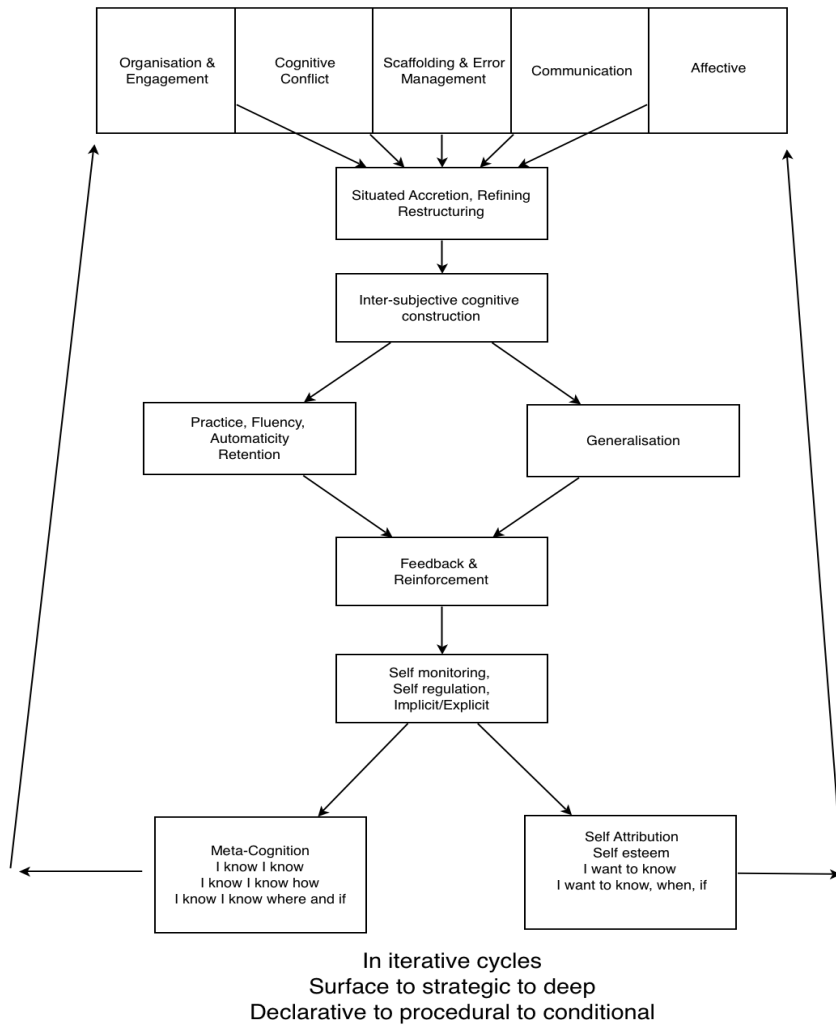
5.2 Observations from the PAL sessions

During the one hour PAL sessions, all students contributed actively to the sessions. Attendance was excellent, and there was a great sense of working in an environment focussed on helping students get the best grades that they could. However, when attendance became voluntary in the second semester, attendance was between two and three students per week with eight unique students attending over the course of the semester.

Despite the fall in attendance, there were a couple of interesting observations and a number of common support issues were dealt with. In one session, one of the peer tutors brought in a set of their own notes from a particular subject. The notes were very well organised and the first year students commented that they were a good example on how to take notes that they would try to emulate. In another session, a student required help with 3D-CAD, and rather than simply doing the exercise for the student, the peer tutor guided the student through a workflow process, or how to organise the drawing process. Both examples show how the peer tutors can act as competent guides for first-year students, not in subject matter but in thinking and learning processes.

This observation again gives confidence in the theories of social constructivism (Kolb and Kolb, 2008) and the roles of peers in the learning process (Topping, 2005). The role of the peer tutor in this cycle or spiral is to control and mediate the process of passing through the stages of the learning process, rather than directly providing answers to the learning task. The model proposed by Topping and Ehly (Figure 8) sums this process up perfectly (Topping, 2005). Students and Peer Tutors work on a particular learning task together, with time on task and how this time is organised is initially mediated by the peer tutor. Different approaches to the task or a lack of required skills leads to a cognitive conflict that leads to a discussion on the best way to tackle the problem, a sharing of ideas, or search for new strategies. Solutions are proposed, checked, modified and rechecked, and the efficiency of the chosen approach may be evaluated. As the proposed strategies are explained, clarified and discussed, communication skills are developed.

Figure 8: A research based model of the cognitive processes student attribute required for Peer Learning, attributed to Topping & Elhy (Topping 2005)



All this happens in a relationship between peers: there is no power structure, and the peer does not hold authority over the student. This leads to trust, self-disclosure, the development of deeper motivation and confidence in the learning process. As the process of learning continues, the student takes on more responsibility for the process, leading to a deep, self-directed learning approach. Beneath this process of active discussion sit the unconscious processes of refinement, re-construction, generalisation, practice, feedback and self-monitoring that lead to the development of a student’s desire to learn and the meta-cognitive strategies needed to satisfy this desire.

5.3 Issues to address

There were a number of issues that stood out and require further research. While attendance at the daytime social events was good, attendance of first-year students at the social events during the evening was very poor. The reasons given on the questionnaire related to family, work or learning commitments; this would seem to link to the research presented earlier relating to transition and sense of belonging, research will be started to evaluate if social and academic engagement are related (Appleton, 2006; Briggs et al., 2012; Tinto, 1988; Crosling, 2009; Morgan, 2011). Initial take up of the peer sessions in the second semester was poor, at one point about halfway in the semester the peers asked if they could postpone the next session while they worked on an important continuous assessment. At the same time, the first years began to directly request urgent help for class tests the same week. Managing the PAL process is as much about teaching students to access the available supports early and often while they are available rather than at the last minute.

5.4 The Peer Tutor Evaluation Questionnaire

The peer tutor questionnaire (Figure 9) was given to the peer tutors at the end of the second semester and focused on three questions:

1. What the peer tutors thought of the PAL programme
2. The types of support they felt they gave to the first years
3. What supports they needed to do that job

Figure 9: The Peer Tutor Questionnaire

What were your impressions of the PAL programme

Could you give us some feedback on the following areas

The concept

The organisation (group meetings, class sessions, timetabling)

Could you say a few words on each of the sessions below, how useful do you think they were, could they be made more useful?

Interviews
Labs/Lab reports
Report Writing
Posters
Revision and exam questions

Was there any subject that we should have run a session on?

What sessions would you be interested in running next semester?

What support do you need as a PAL volunteer?

The peer tutors saw the PAL programme as having three aspects: a social dimension that allowed students from all years to interact and learn from each other; an academic dimension which allowed them to help the first years learn from their own mistakes and to reduce the stresses they felt themselves as they progressed through first year; and a personal dimension giving them an opportunity to develop themselves. Respondents felt that becoming a peer tutor was good for their personal development, motivation and therefore their engagement. This observation is supported by research on engagement that has identified at least six dimensions of student engagement: faculty/student relationships, peer support during learning, student aspirations and goals, family support for learning, and extrinsic motivation (Appleton 2006; Tinto and Cullen, 1975). Knowing these dimensions provides direction in research for diagnosing student engagement during the Spiralling Induction process.

Part of the personal growth of the peer tutors included identifying gaps in their own learning skillsets and they requested support in particular curriculum areas. At the end of the semester, they also requested some training in pedagogical strategies, specifically on how to get difficult concepts across to students.

At the start of the programme the peer tutors acted as support agents within the classroom, themselves supported by the peer coordinator, who was the lecturer of the Learning to Learn module. As the programme progressed, the peer tutors began to take on more responsibility, shaping the programme based upon the feedback from the first year students. The second questionnaire given to the first years looking for suggestions on the support needed was the peer tutor's idea. Most of the peer tutors who took part this year want to come back next year as peer tutors to second year students.

Figure 10: Responses from the Peer Tutor questionnaire.

What support do you feel you gave to the first year students?
<p>Personally I focussed on the Solid Modelling side of the support as I feel that Solid Modelling is one of my strongest subject areas. This support was provided by simply allowing the student to meet me once a week in order for them to ask me questions regarding the software. The students would come with issues that they had developed from the class time and then hopefully I would be able to tell or show them how to fix the problem or how to go about a certain problem. – Paul Quinn</p>
<p>I supported the first years in problems they were having with Electrical Engineering. This module deals with the basic structures of DC and AC motors and generators. I attempted to answer any questions they may have had, as well as working them through tutorial questions and exam papers. I felt I gave the first years the opportunity to come to me with any questions or concerns they may have had throughout the year, be it with Electrical Engineering and other academic work, or with general college questions and problems. – Sarah Daly</p>

Figure 11: Peer Tutors' views of the PAL programme

What were your impressions of the PAL programme?
Very good creates a link between all engineering students.
Very good idea, good motivation to help fellow engineering students, have a better chance than you did and make their studies much less stressful.
Fantastic Opportunity for myself and the upcoming first year class to socialise, learn and engage together.
What support do you need as a PAL volunteer?
Linking contact between our year and years ahead of us; discuss project ideas and formats with them.
Maybe try to get a link between 2 nd Year and 3 rd Year
Possibly we need more preparation and more set questions rather than being handed an exam paper and asking – 'What questions are you struggling with'
Plan is good, i.e. weekly meeting to assign tasks etc. Good feedback and preparation Set up a block for study between peers and students for practice and advice.

6. Future Directions

Overall the PAL programme was a great success, in the first semester particularly. Students' learning development was enhanced and a learning community was created, a community of practice between students, peer tutors, the Engineering Society, faculty and Institute staff.

There are a number of aspects of the programme that must be further developed:

6.1 Learning the learner's needs at each stage of the programme

It became clear as the programme progressed through the different stages of the academic year that learners and peer tutor needs are different and vary through the year. One of the challenges over the next few years is to attempt to map these needs so that a better PAL programme can be developed. It is also clear that the academic needs of the first year students may not be those envisaged by the academic staff, again these need to be mapped over time so a better programme can be developed.

6.2 Marketing the programme to students

Once the PAL programme switched from module-based to voluntary attendance and attendance diminished, it became clear that marketing the programme to the students is required. This must be done carefully and in a way that emphasises the developmental nature of the programme rather than focus on the perceived remedial nature of peer support.

6.3 Training for peer tutors

While the peer tutors enjoyed the informal nature of discussion of upcoming learning units each week, they felt they would benefit from training on learning theories and strategies. Specifically the current peers have requested training on how to get theory across to students succinctly.

6.4 Starting early and embedding it into the culture of the department

This year, the PAL programme will start from the first week with peer tutors being introduced to first year students during induction week activities. Prospective peer tutors will be recruited over the summer and first two weeks in September. Training will be conducted in the second and third weeks of September.

6.5 Academic credit for the peer tutors

This year all peer tutors were given a certificate for contributing to the PAL programme; from this year work will start on offering academic credit through the Institute's Certificate in Volunteering.

6.6 Improving the process of evaluation

Evaluation this year was limited. A new evaluation process is being developed that will attempt to map the learning needs of students at each level of the Mechanical Engineering programmes. Particular attention will be given to the process of transition that occurs during the first year. More focus will be given to the evaluation of the process of meta-cognitive strategy development that occurs during the PAL sessions.

6.7 Resourcing and financial support

A sustainable model for funding and timetabling still needs to be developed for the PAL programme. This will be investigated over the coming months.

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