Using IT Support to improve the quality of Peer Assisted Learning

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Abstract

Peer assisted learning (PAL) is one way to increase the empowerment of students through their learning practices and, hence, enhance their learning journey. PAL involves students mentoring groups of academically less experienced students; develops the quality and diversity of student learning, and enables students to become active partners in their learning experience. PAL supports student transition into higher education and there is evidence that it can aid retention in the early weeks of degree study. Retention is becoming a key issue for universities and one of the key performance indicators (KPIs) of quality education under the strategy for higher education set out by the current government.

The PAL³ project is funded by Learn Higher and is an on going project investigating the use of IT support to improve the quality of Peer Assisted Learning. The project has set up a learning environment for students, and a knowledge base for PAL student mentors and PAL and other academic staff.

This paper reports on initial findings from the project which can be divided into two strands. Firstly, the compilation of a staff knowledge base has highlighted the fact that PAL is known by different names and has different meanings in different places. We provide an initial classification. Secondly, the PAL student environment, which has been implemented and used by the student cohort and their PAL student mentors, has highlighted issues that were not envisaged at the beginning of the study and this has implications for future work.

1.0 Introduction

In the future, university funding will be based on a greater element of competition and one of the bases for this funding will be quality. Those courses that meet the

governments strategic skills needs will receive funding which has been diverted from courses that do not meet high standards of quality. The quality rating will be based on the quality of learning and teaching and there will be greater emphasis on the quality of the student experience [1]. This will be measured using current factors such as the student survey, but in the future will also include additional Performance Indicators such as student retention [1]. Wallace [2] believes that 'to get students to stay, you must start them right' and that retention is not a strategy but an intended outcome of well designed policy and practice that has student satisfaction as a primary goal. Krause [3] highlights the fact that faculty-based evidence of academic support strategies for first year students is also considered an indicator of quality in learning and teaching.

With a number of policies and strategies at both governmental and institutional levels focussing on quality measures, increasingly giving students greater information with which to make informed decision and allowing them greater involvement in their learning will highlight their satisfaction [1]. Peer assisted learning (PAL) is one way to increase the empowerment of students because it engages students as partners in their learning experience. It involves students mentoring groups of academically less experienced students thus developing the quality, quantity and diversity of student learning [4, 5]. PAL provides a supportive environment which assists student transition into higher education [6] and there is evidence that it can aid retention particularly on science and engineering courses [7, 8].

This paper gives an outline of the background to PAL in Section 2 before outlining our initial categorisation of PAL types in Section 3. Section 4 describes PAL at Bournemouth University (BU) and the Learn Higher funded PAL³ Project with Section 5 describing our initial findings. Our conclusions are at Section 6 and, as the project is still running, our plans for future work are at section7.

2.0   Background to Peer Assisted Learning (PAL)

Peer Assisted Learning (PAL) was introduced to the UK in 1990 based on a successful model in the United States called Supplemental Instruction. It originated at the University of Missouri, Kansas City in 1975 and gained momentum in the UK where there was a requirement to improve teaching quality using less resource [9]. There are a number of different definitions given to the practice but Topping describes it as 'people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching' [9 p6.]. PAL, often called peer tutoring, usually consists of student leaders, often called tutors or facilitators, meeting regularly with groups of other students (usually first year students) from the same course with the aim of supporting their learning and study skills [6].

PAL Leaders gain from mentoring others because they improve their sense of inter-personal skills such as confidence, communication, problem solving and

presentations and it allows them to find a meaningful use of the subject matter of their studies [10]. Additionally, explaining to others reinforces their learning and also deepens their understanding [10, 11]. Communication skills are seen as particularly valuable by the students themselves, as well as by prospective employers, and the PAL experience gives the students early (and documented) expertise in this area. Although, these types of skill are more 'difficult' to measure Topping [12] believes they have significant added value for little input. PAL Leaders have basic training from staff and they have a PAL staff mentor to guide and assist them throughout their time as PAL Leaders. Individual students benefit by more focussed instruction, responding to their peers and receiving companionship from tutors [10]. In addition, there is evidence of improved grades in the targeted academic areas [12].

Topping [9] agrees with these arguments, but also suggests further advantages to the institution in terms of more effective learning, and benefits such as reducing the isolation of students, raising aspirations and increased empowerment. More recently, other benefits have been identified relating to transition, first year experience and retention [2]see [6] for a summary.

3.0   Classification of types of Peer Assisted Learning

There are numerous ways in which PAL exists informally, but this study will only discuss the formal programmes which are commonly initiated by staff and where resources, such as rooms, equipment and timetabling, are provided for students by the institution to facilitate their learning. In addition, the PAL programmes under scrutiny here are not those normally termed peer assessment or peer monitoring; nor surrogate teaching, proctoring, co-tutoring or teacherless groups [10]. We will use the terms PAL and peer tutoring interchangeably.

Falchikov [13] classifies peer tutoring into four different categories and these are agreed by Tariq [14] who adds examples:

- same-level peer tutoring, where participants within a cohort have equal status, e.g. in terms of their experience, skills and/or attainment levels;
- same-level peer tutoring, where unequal status is identified and introduced by the co-ordinator, e.g. students may be selected to assume the role of tutor on the basis of their higher level of skills and/or academic attainment;
- cross-level peer tutoring, involving a single institution, where unequal status derives from existing differences between student tutors and tutees (e.g. second- or third-year undergraduates tutoring first-year students). This model forms the basis of Supplemental Instruction [9];
- cross-level peer tutoring, involving two institutions, e.g. The Pimlico Connection involving Imperial College students helping to teach science and mathematics in local schools [10].

Using Falchikov's (2001) classification Bournemouth University's Software Systems Framework would fall into the category of cross level peer tutoring involving a single institution. This categorisation offers very little information about the implementation of the programme; merely advising of the status of the PAL Leaders compared to the students learning group. There is no supplemental information about the staff involvement, duration, scope, subject, or integration within the course structure. Without this additional information, attempting to emulate the success of such a programme elsewhere, or to compare programmes to gauge the factors for success in a PAL programme is not possible.

There have been numerous implementations of PAL (see [6] for an overview). However, Black and Mackenzie characterise the area as being student focussed, low level and piecemeal [6]. Therefore, categorising such an enormous range of methods to make them swiftly comparable is a complex task. There are a number of possible criteria which may be used to perform this task, however, the following criteria are proposed by this paper as an initial set for categorisation and comparison of PAL programmes.

3.1 PAL Leader Status

As already proposed by Falchikov [13] , the PAL leader status, compared to that of the learning group, can change the group dynamic significantly and determine the success of a PAL programme; this alone however, is not sufficiently informative for our purposes.

- **Natural Selection Peer Leader**: PAL leaders may be selected informally from their peer group. They may never be recognised formally as such, however, by the nature of the group interaction a single individual emerges as the natural choice for group leader.
- **Elected Peer Leader**: A peer group may hold a democratic election to select their own group leader. The ownership of the selection process and the final selection is with the peer group to be lead.
- **Promoted Peer Leader**: Staff make the selection of the leader role. This could be based upon an ability which stands out, which may also be supported by qualifications or marks in a topic. (The staff ownership of the selection process makes this type of group more likely to be taking part in a programme where staff direct students on session content and activities). Often promoted peer leaders are trained by the selecting staff.
- **Next Level Peer Leader**: Leaders are selected from a group who have already succeeded the learning group and are now themselves learning at the next level above. The principle is that those who recently progressed from the peer group are familiar with the purpose of the session and have an overall perspective of the work to be covered by students. An example of this is the PAL run on the Software Systems Framework at Bournemouth University where second year students are selected to run sessions for first year students.
- **Previous Level Peer Leader**: The selection pool for group leaders is a group who are currently studying a topic in detail. Students in the learning

group have now moved on to the next level but need an opportunity to recap a topic prior to a specific piece of work or an exam. For instance a group of first year students studying a topic in depth may be the selection pool for leaders of second year revision study groups.

3.2 Course Scope

This criterion is often defined by the problem it is implemented to solve. The amount of material covered in the course, the modules or topics PAL is applied to, and the duration, (usually considered in weeks), are often defined by the duration of the topic or module as it is studied often in parallel in normal teaching sessions.

- **Single topic:** These types of implementation are of short duration and are used to cover specific topics within a unit, or module. Due to their short duration sometimes efforts to enable PAL are limited because greater resource commitment may be deemed 'not worth it' for such a short period of time. On occasion this may result in PAL sessions not reaching their potential. The session content is sometimes very tightly controlled by staff in short term implementations, in order to ensure the delivery of key materials. Some implementations come very close to the PAL Leaders becoming teachers, as in Tariq (2005).
- **Single Module:** These types of implementation are usually for the duration of the module, and target a module which is often described by students as 'difficult'.
- **Course Wide**: The PAL session can be used by students to cover any topic throughout the academic year. Different modules and topics become a priority for study at different times. Because the sessions are often covering a longer duration e.g., a term or year, students can repeat topics or take their time about topics. They can be flexible about which topics are covered and when to make it relevant to assignments and exams. At Bournemouth University, on the Software Systems Framework, such decisions can be made entirely by student groups, empowering them to make all decisions about session content and informing the PAL Leaders of the direction they wish the session to take.

3.3 Rewards

- **Employment:** The position of PAL Leader is a job. The position is advertised, applied for and successful candidates are paid for their efforts. An example of this would be at Bournemouth University on the Software Systems Framework where the position of PAL Leader is an example of real employment which is often listed on a PAL Leader's curriculum vitae. Students have been through an interview process to get the position and may request a reference should they wish to do so at a later date. It is regarded as improving the chances of employability for their work placement year on undergraduate courses and for a permanent position at the end of the course.
- **Course Credit:** The position may come about by staff or self selection as in the Employment status. However, the reward is not financial but extra credit towards the course. However, this may suggest that PAL Leaders

receive an unfair advantage over the rest of their cohort when only limited numbers of PAL Leaders are required and may make offering course credit unacceptable. However, on some programmes course credit may be the only type of reward available to staff to incentivise.

- **Prestige only:** The position may come about by staff or self selection as before. The students' only reward is the right to show they have done the work on their curriculum vitae and to show employers that they have held such a post. This method could mean leaders are reluctant to volunteer, and can be unreliable when they do commit to the task.

3.4 Staff Involvement

- **Staff directed sessions**: Staff implement PAL to solve a specific problem and know exactly what must be covered by students in the limited number of PAL sessions available. To ensure complete topic coverage they prescribe what must be covered by a variety of methods. They may train PAL Leaders in exact detail of what must happen within the session. They may offer examples for students to work through, or they may offer the PAL Leaders a choice of how they deal with the topic in discussion with them and subject to approval. The point of this type of session is to direct students through a particular area previously identified as a problem by a member of staff. This style is useful where time is of the essence.
- **Staff Topic Suggestion**: In this implementation PAL Leaders are offered suggestions for topics but how they implement learning for the students is either the PAL Leaders choice or selected by the learning group.
- **Staff Resource Provision**: Staff enable PAL by providing facilities, such as rooms, timetabling of sessions, and guidance if requested by PAL Leaders. The sessions are entirely run by PAL Leaders and the content of sessions is determined by students and their wishes. On Bournemouth University Software Systems Framework students and PAL Leaders have access to the assignment calendar and teaching schemes for all units. The learning group determine the session content and PAL Leaders guide students when they make no decision, using the assignment calendar and teaching schemes to guide them towards relevant areas.

3.5 Session Integration

This form of categorisation is highly related to scope. The most popular modes of delivery often use taught sessions for short term use of PAL and the session integration category refers to the amount of integration of PAL into those taught sessions.

- **Taught Sessions:** Where taught sessions are normally scheduled, PAL is used as a normal delivery method for a unit or topic. For instance, a unit of mathematics may have sessions led by PAL Leaders throughout the academic year or, if the scope is single topic, the provision may be short term and the same sessions are often taken by staff during the rest of the academic year.

- **Additional Sessions:** This is where PAL sessions are additional to the unit or course's usual allocation of resources so that additional meetings are held for PAL to those used by taught units. They may or may not be included on the students' regular timetable.

3.6 Timetabling

Timetabling has been found to be a highly influential factor during the early implementations of PAL at Bournemouth University, where sessions included on students' timetables, as part of their weekly routine from the beginning of the year, improved PAL attendance dramatically.

- **Timetabled**: PAL sessions are included on their timetable when it is given out at the beginning of the academic year. It is believed that this enforces the perception that PAL sessions are to be taken just as seriously as any other session on the timetable. This would include programmes where PAL is included within scheduled taught sessions.
- **Additional**: These sessions are not on the usual timetable for the students or, are added after the taught session timetable is received by students. They may be announced as separate meetings or perhaps do not commence until some weeks after the beginning of the academic year making them additional to the students' weekly routine. In this style of implementation often PAL Leaders take responsibility for arranging times and rooms to facilitate sessions.
- **Subject:** The topic of the course may have some bearing on the success. It may be that, for instance, PAL lends itself best to science subjects rather than arts, or practical subjects rather than theoretical. Currently, there is no information available [6]. Identifying the areas in which PAL operates most successfully will depend on the current and previous use and perceived success.

3.7 Implementation

To demonstrate the use of the categorisation, the table for Bournemouth University Software Systems Framework is provided. The placing of multiple programmes within a matrix enables easy comparison, and filtering of data based on the values of each attribute (see Table 1).

Programme	PAL Leader Status	Course Scope	Rewards	Staff Involve-ment	Subject	Time-tabled?	Session Integration
Bournemouth University Software Systems	Next Level	Course Wide	Employ-ment	Resource Provision	Computing	Yes	Additional
School of Biology and Biochemistry, University of Central Lancashire (Tariq, 2005)	Promoted Peer Leader	Single Topic	Prestige	Staff Directed	Bioscience	Yes	Taught session

Table 1: Example of PAL categories

There are many other criteria which we are considering for inclusion in the categorisation suggested here. These include student to leader ratio, group size, whether attendance is optional, and training in terms of type and duration; all possible factors for success on a PAL programme. For example, the current criteria would not differentiate between two implementations with the same attribute values across the board where class sizes were of 18 led by a pair of PAL Leaders jointly as at Bournemouth University, or an implementation where classes were split into groups of only 5 students per PAL Leader as in the example discussed by Tariq (2005).

By examining the criteria and the probable success factors in specific academic areas we hope to contribute to the improvement and quality of learning in that area. A good example is discovering that timetabling PAL sessions from the beginning of the academic year is an attribute common among PAL programmes which are known to be successful. For the moment we have many examples which are mostly conjecture, and one reason for categorising PAL programmes is to create some building blocks for future work where we may be able to see if such relationships exist by drawing upon historical data.

4.0 PAL at Bournemouth University

PAL has been implemented at Bournemouth University since 2001 during which time over 700 second year undergraduates have received training to become PAL leaders and 8000 first year students have benefitted from their guidance and experience [4]. Since 2008 it has been implemented in some form across most of the university. PAL has been used on the Software Systems Framework (and its predecessor courses) in various incarnations since 1996 when the BSc Business Information Technology degree piloted a student led informal trial for three years. This work led to formal funding being sought for a university wide project in 2001.

The current Software Systems Framework (SSF) has 208 students enrolled on Level C, (first year undergraduate), in 12 seminar groups and PAL is currently implemented as a fully embedded part of the timetable with a dedicated hour each week given to PAL. Previous experience has shown that without fully embedding PAL into the timetable, PAL attendance is likely to be very poor (although the expectations are that attendance will often fall after the first term regardless of timetabling; usually as students gain confidence in their learning strategies). The PAL sessions are run by PAL Leaders from Level I (second year) in cross level peer tutoring [13]. The students will have applied successfully for the position of PAL Leader towards the end of their first year. They will have been interviewed by the PAL Contacts (staff who co-ordinate the PAL Leaders for the Software Systems Framework) and will also have attended a two day training session run centrally within the university. Attendance at the training session is mandatory and failure to attend will result in the position being revoked.

The PAL Leaders are usually organised into pairs and each pair will run the PAL sessions for two groups. This allows the PAL Leaders to support each other and also provides consistency for the students should a PAL Leader be unwell or unable to attend a session. PAL Leaders are paid for their time, at a standard administrator's hourly rate (currently £8.11 per hour). This includes delivery of the PAL sessions, half an hour preparation per session plus meetings and, often, follow-up training which is provided centrally. This has meant that the PAL Leaders are fully invested in the PAL programme and there have been no issues or problems with PAL Leaders not attending or ultimately wishing to withdraw from the scheme. In addition, PAL Leaders have a follow-up in-group assessment by one of the central PAL Team to ensure that they are leading the PAL groups correctly i.e., providing a structured session for the students to enable their learning via discussions, signposting and other activities.

The overall co-ordination of PAL on Software Systems is carried out by two members of staff who are known as the PAL Contacts. They are staff who work within the Software Systems Framework and provide a reference point for the PAL Leaders within the school and all queries and problems are directed through them. The PAL Contacts regularly meet with the PAL Leaders to ensure the smooth running of PAL within the framework. The PAL Contacts are also responsible for recruiting and interviewing prospective PAL Leaders, ensuring that the timetabling for each session works for both the students and the PAL Leaders and signing claim forms for the PAL Leaders. Please note however, that the initial and follow-up training is provided centrally by a PAL Team to ensure PAL Leaders across the university have the necessary skills.

PAL runs for the full duration of the first year (level C) and topics from any unit within the course may be covered. Each week PAL Leaders will run a PAL session which covers a topic which is either informed by the PAL Contacts, the Level C assignment calendar or the students themselves in discussion with their PAL Leaders. There are no staff directed sessions as the PAL Leaders are left to cover

the topics in whatever way they feel is best. However, regular meetings are held between PAL Leaders and PAL Contacts where any specific topic requirements are pointed out. In addition, the PAL Leaders have access to all of the material provided for the First Year by the academic staff through our Virtual Learning Environment (VLE), such as lecture notes, seminar questions and assignment briefs. The PAL Leaders may on occasion be provided with additional material for the students by the academic staff.

4.1   The PAL³ Project

A student survey carried out on the Software Systems Framework amongst first year undergraduates in March 2009, showed that 63% of respondents found PAL helped them cope with University, and 54% of respondents also found PAL helped improve their' understanding of topics which were found to be difficult [15].

We were conscious of how easy it is to lose knowledge, expertise and examples of good practice and how work in the area is fragmented [6]; in addition we wanted to improve communication at all levels of PAL. It should be noted here, that the PAL Leaders are the linking point with students as the PAL Contacts do not normally have contact with students with regards to PAL. The initial concept involved building a knowledge repository for both PAL Contacts and PAL leaders, a communication tool between PAL Leaders and their students and a PAL learning environment for the students. With the growth of social networking it was felt to be a good time to introduce this type of technology to PAL and a web portal would be a good way of implementing this alongside a content management system.

We created Facebook groups for all student groups. The priority was to get a system built which the students would be able to access from the start of their University experience and a working system was introduced to the PAL Leaders at their first meeting with the PAL Contacts on 1ˢᵗ October 2009 and they were then able to show their student groups. It has thus been in use as a tool at the student and PAL Leader level since that time. The novelty of this part of the system is that the PAL Contacts have no input. The system is owned by the PAL Leaders and works as a PAL virtual learning environment. PAL Contacts are able to 'police' the system if necessary.

The second part of the project, involving a knowledge repository for PAL contacts is still underway, with an expected initial system due to be in place in Summer 2010.

5.0   Initial Findings

An interim informal questionnaire was given to the PAL Leaders after a month to assess their opinions of the PAL³ project.. There was a 55% response rate to the questionnaire and all respondents were positive about the project. At this point the recurring themes were:

- A place to store PAL materials for both PAL Leaders and students was very beneficial.
- A system which is external to those already in use by the students i.e., Bournemouth University's Virtual Learning Environment (myBU), email and Facebook, was an additional burden.

The web system between PAL Leaders and students was evaluated using focus groups held within individual PAL sessions for each of the twelve seminar groups on the framework. In addition, a focus group was held with the PAL leaders. Focus groups at the broadest level are collective conversations or group interviews [16]. The group narrative was recorded and the results are currently being evaluated using template analysis [17].

However, early findings appear to corroborate the informal survey. Both the students and the PAL Leaders found the repository section of the PAL³ system very useful, but were not particularly interested in any other features. They would prefer to use PAL within the university Virtual Learning Environment. One student commenting '*I open Facebook to talk to my mates and then I open myBU* (the VLE) *then I have to open PAL³. It would be simpler just putting PAL in myBU*'. This is being explored; however, initial findings are that student access to the VLE is a difficult proposition and that there are numerous security considerations to overcome. Interestingly, the Facebook groups were not used. At least one PAL leader duplicated the PAL³ contents within Facebook. A comment by one student may explain the non-use. He said '*[that] 'work' and social should be kept separate*'. Other students have suggested creating the PAL³ system as an iPhone application. A straw poll of students present found that one third of them had iPhones.

The work on the PAL Contact or staff repository is progressing and early findings on the categorisation of PAL types to enable a comparison have been reported in Section 3.0.

6.0 Conclusions

The need for a knowledge base for PAL Contacts and other academic staff is important to allow knowledge and experience to be retained. Currently, existing knowledge is fragmented, often at a low level and implementation oriented. There is some work on evaluation, but this too is often fragmentary. The work on categorisation is timely. By creating these categories it will be possible to start using the repository to store work carried out in similar areas together and allow expertise to be collected and, potentially, synthesised. .

The work on the communication tool and knowledge repository for PAL Leaders and students is still being evaluated, but has shown that the knowledge repository has been particularly welcomed. The repository is controlled by the PAL leaders and they believe that this is the way forward with further developments. The students felt it should be part of the University VLE and this is currently being

explored. Software Systems students have found PAL particularly useful in improving the quality of their work and we have been encouraged by their request for a support system in the VLE to improve their learning process.

7.0 Further Work

The next logical step is the categorisation of current PAL programmes globally, enabling comparison of implementation methods. In the long term it would be beneficial to look at the degree of success on PAL programmes, wherever it may have been measured. Finally, a study looking for relationships between success and implementation factors would be completed enabling staff to ensure their PAL programme can best fulfil its potential. Already it is clear that there are a number of candidate units for measuring the success of PAL programmes, such as student engagement and exam or coursework results. This may mean reassessment activities become necessary in order to complete data sets so that they are comparable. Such future work may provide supportive evidence of which implementation factors enable students to get the most from their PAL sessions.

Allowing PAL leaders access to upload their own content to our VLE is being explored, along with other steps such as creating a PAL: VLE with the university VLE.

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