An investigation into Peer Assisted Learning in the current Liverpool MBChB Undergraduate Medical Curriculum

Thesis submitted with the requirements of the University of Liverpool for the degree of

Masters in Philosophy

By

Victoria Tay

August 2014

Abstract

Introduction

Peer Assisted Learning (PAL) is an essential part of Medical Education. PAL involves teaching occurring between fellow students where 'people from similar social groupings who are not professional teachers are helping each other to learn and learning themselves by teaching'(Topping 1996). Further exploration of this important part of learning within education deserves formal recognition in order to enhance the learning experience for medical students. The importance of PAL for medical students has also been highlighted in recent recommendations on medical education. Although there has been some evidence of the benefit of using PAL, such research has not yet been undertaken in the University of Liverpool (UOL). The primary aim of this study was to identify the views of the current undergraduate population at Liverpool Medical School using the existing curriculum model in relation to Peer Assisted Learning.

Methods

Both qualitative and quantitative methods were used in this study. Firstly, a literature review was undertaken followed by a nominal group and two focus groups. The aim of the nominal and focus groups were to find out what students understood by and what their experience of PAL was. These methods were carried out in a sequential manner in order to increase the triangulation effect of themes. The themes generated from this and the literature review were used to generate a questionnaire asking the students about their current experiences of PAL and how it could be improved for current and future cohorts of students. The questionnaires were distributed to all medical students studying between 2nd and 5th year of the MBChB programme at the UOL.

Results

A response rate of 53% for the questionnaire was achieved. The results show that students find PAL invaluable and a more formal approach to timetabled opportunities for PAL would be appreciated. Students found their learning was greatly enhanced and they felt that the reciprocal benefit of 'being a teacher' not only improved their confidence in teaching but also increased their awareness of the importance of clinicians developing effective teaching skills. It was felt by many students that this contribution to their personal and professional development would have a substantial bearing on their future practice. The focus groups demonstrated a positive attitude towards PAL with students not only identifying existing opportunities and perceived benefits but also perceived barriers to PAL. These were explored in detail and a wide variety of solutions were suggested. The nominal group showed great appreciation of direct teaching from senior students and a suggestion for improvement of PAL in the curriculum that was extremely important to them was the sharing of resources, universally across all years.

Both focus and nominal groups were very useful in providing topics for the questionnaire and also gave good additional information.

Conclusion

PAL is highly valued by the medical students at University of Liverpool. The dual benefit reported for both teacher and students makes PAL an extremely attractive tool. Creating more opportunities in the student timetable for PAL may enhance the curriculum and may help to foster and mould a more diverse and enthusiastic learning environment, which in turn may have a positive impact on the practice of tomorrow's doctors.

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Acknowledgements

First and foremost I would like to thank Dr Simon Watmough (SW) for his time and invaluable help supervising this thesis and for his overall support during my year of intercalation. These thanks are also extended to Professor Helen O'Sullivan for introducing me to this department within School of Medicine, encouraging me to pursue this MPhil and also being an instrumental secondary supervisor.

I would like to thank Ray Fewtrell for being an excellent mentor who has helped me on a number of occasions. Thank you to Reverend Dr David Taylor and Dr Gill Vince for agreeing to examine this thesis and making the time and effort to listen to my work.

I would like to thank all the students involved in the focus, nominal groups and to those that not only responded to the questionnaire but encouraged their friends to also respond. I would not have been able to complete this piece of research without them and greatly appreciate their time.

Lastly, I would like to thank my family and friends, without whom this would not have been possible, providing me with constant support and encouragement all the way through this project.

Glossary/abbreviations

EU – European Union

FPAS – Foundation Programme Application System

FY1 – Foundation Doctor Year 1

HARC – Human Anatomy Resource Centre

LOCAS – Liverpool Objective Clinical Assessment Scheme

MCQ – Multiple Choice Questions

MPhil – Masters in Philosophy

OSCE – Objective Structured Clinical Examination

PAL – Peer Assisted Learning

PASS – Peer Assisted Study Sessions

PETA - Professional Education and Training Appraisal

PBL – Problem Based Learning

PMETB – Postgraduate Medical Education and Training Board

SAMPs – Selective in Advanced Medical Practice (clinical placement in the Reformed

Medical Curriculum (RMC) for final year medical students)

SATs – Students As Teachers

SI – Supplemental Instruction

SPSS – Statistical Package for the Social Sciences

TOTR – Teaching On The Run

UCCT – University Community Clinical Teaching

UOL – University Of Liverpool

US – United States

Chapter One – Introduction

<u>Background</u>

This thesis investigates Peer Assisted Learning (PAL) within the undergraduate medical curriculum at the University of Liverpool (UOL) in the academic year September 2013 to July 2014.

PAL is an important component of Medical Education. Further exploration of this aspect of education is needed in order to enhance the learning experience for medical students. Particularly, within a Problem Based Learning (PBL) course (Hill, Liuzzi & Giles 2010), PAL is an integral part of the curriculum and a formal study of the different outcomes would be beneficial both regionally and nationally. The implementation of PAL could be of great additional value to all curricula if benefits in facilitation of learning are proven. PAL implies teaching occurring between fellow students (Silbert & Lake 2012) where 'people from similar social groupings who are not professional teachers are helping each other to learn and learning themselves by teaching (Topping 1996).

There are three aims of this thesis. The first aim of this thesis is to determine what students themselves define as PAL and research the areas of the Liverpool curriculum in which PAL presently exists. UOL students in this study population currently use a PBL programme that encourages students to teach their peers within these sessions, alongside clinical teaching between final year and second year students in various hospital placements. The second aim of this thesis is to identify and evaluate the PAL experiences of Liverpool undergraduates. As this thesis explores all aspects of the curriculum and gathers views from students in 2nd -5th year this has allowed the researcher to accumulate a full picture of the impact and benefits of

PAL within the curriculum. At the time of this thesis, the curriculum was undergoing a review and therefore was particularly relevant to the research carried out in this thesis. The final aim of this thesis is to recommend implementations for change. If PAL is proven to facilitate and benefit student learning, steps should be considered to incorporate it into the curriculum and ultimately improve medical education. This investigation could be extrapolated to other UK medical schools by adaptation of the questionnaire used in this thesis to investigate student views of PAL in their curriculum.

The results from this study will allow the medical school at the UOL to implement improvements pertaining to PAL and enhance the curriculum. By following the recommendations at the end of this thesis, it is hoped that the curriculum advisors could implement a formal programme of PAL as an additional support network to the advantage of future students. In addition, an opportunity for medical students interested in education and teaching will be encouraged. As will be mentioned below, teaching is a requirement of the General Medical Council (GMC 2009). The benefits experienced by the 'educators' and students being educated will highlight the many advantages for careers in Academic Teaching posts as well as provision of high quality teaching in all subject areas. As a result, the findings will be applicable to medical curricula across the United Kingdom.

Students in the current 2013-14 curriculum would be expected to experience PAL in a number of ways, for example, within a mentoring system. A system was recently implemented in September 2013 by the School of Medicine; previous to this there was an informal mentoring system introduced by the students' society that was not affiliated with the university. Other possible experiences include teaching within University Community Clinical Teaching (UCCT) sessions and PBL sessions, becoming hospital mentors and

eventually at the other end of the scale when in 5th year, facilitating PBL sessions. Medical students are known to participate in many extra-curricular activities i.e. sports teams, musical events, orchestras etc. and it has been known for the older years within these groups to offer not only social but academic support. All of the above were mentioned in the focus groups that were held for this project (Cross Reference Chapter 4).

PAL is a valuable tool for Medical Education that is an area that has not been previously researched in depth within the University of Liverpool. This study is particularly appropriate in view of the present curriculum review of the undergraduate medical programme and it is hoped that it will make a considerable contribution to the education of future cohorts of medical students.

The study population in this thesis

Data was collected from medical students from 2nd- 5th year. This cohort included all students on the existing MBChB A100 course - regardless of those that were currently intercalating in the academic year 2013-14, students that had previously intercalated and all graduate entry students. The only cohort that was excluded was the first year medical students that had been admitted in September 2013. It was felt that at the time of the study; November to March 2013-14, they would not have had enough experience of the Liverpool curriculum or PAL to be able to comment equitably on this topic as extensively as their learned colleagues. Therefore, in the first part of the questionnaire the PAL experiences of 1st and 2nd year are amalgamated into one question. Some parts of the question are only applicable to 2nd years and these aspects were made clear (See Chapter 4 and Appendix).

<u>Hypothesis</u>

The hypotheses for this study are:

- Undergraduate medical students will report that PAL is beneficial to them.

- The students will feel that PAL will improve their individual learning, knowledge base and their skill set in teaching, communication and teamwork.

<u>Medical education in the UK</u>

Undergraduate medical education in the UK currently consists of a 5 year undergraduate curriculum, followed by a post as a Foundation Year 1 doctor. Following graduation, students are provisionally registered with the GMC and this registration is confirmed on successful completion of Foundation Year 1 (GMC 2014a). Subsequently, they enter Foundation Year 2 before deciding on specialising in certain fields of hospital medicine, surgery or General Practice. It is expected that during medical school, students will have been exposed to all areas of medicine, surgery and specialties i.e. Obstetrics & Gynaecology, Paediatrics etc. They should have had minimum 5,500 hours of clinical teaching, in accordance with GMC regulations (Article 23 of the Directive), and have passed both written and practical examinations at a satisfactory level (GMC 2003).

Informally, PAL has been used for many years in education when peers ask their colleagues to explain something they have not yet understood. In medical education however, it has only been recognised as a beneficial tool in recent years. PAL is important for future careers as students must understand how to lead and work within a team, approach problems from various different angles and establish a confidence in themselves that will aid their work as clinicians.

Role of General Medical Council and PAL

The General Medical Council (GMC) was established following the Medical Act in 1858. The Council governing body comprises of 12 members where half are lay members and remaining half are doctors whom act on behalf of patients. It is a registered charity, an independent body from the government and the NHS in which their role is to 'protect, promote and maintain the health and safety of the public by making sure that doctors follow proper standards of medical practice'(GMC 2014). These standards are maintained by keeping up to date registers of qualified doctors, fostering attitudes of good medical practice, dealing with fitness to practice issues and promoting high standards of medical education and training. This thesis is most concerned with promoting high standards of medical education and training.

In regards to medical education, the most relevant document released by the GMC is *Tomorrow's Doctors (2009)*, of which the first edition was published in 1993. This document began a radical reformation of many curricula for many medical schools. It was the instigation of the development of the first 'core curriculum'.

The document seeks to set standards for knowledge, skills and behaviours that are expected of medical students to acquire during time at UK medical schools. All UK graduates are required to demonstrate all outcomes listed in the document to a satisfactory level. Guidelines and standards regarding methods of teaching, learning and types of assessment are also available. The GMC website specifically states that the document covers:

- Assessment in undergraduate medical education
- Clinical placements for medical students

- Patient and public involvement in undergraduate medical education

- Developing teachers in undergraduate medical education (GMC 2014b)

The final point about developing teachers is most applicable to this project. The guidance on teaching and training in the document divides education into learning systems, skills and training (GMC 2009).

1. Teaching and learning systems – "must take into account of modern educational theory and research, and make use of modern technologies where evidence shows that these are effective".

This guideline incorporates the current rising popularity of social media and the advancement of educational theory.

2. Teaching skills – "If doctors have teaching responsibilities, they must develop the skills, attitudes and practices of a competent teacher".

This guideline implies that the teaching of medical students or other doctors must be of a certain standard and level of satisfactory competency.

3. Teaching and training
   a. "Be able to demonstrate appropriate teaching skills"
   b. "Be willing to teach colleagues and to develop their own teaching skills"

These statements indicate that training within the field of teaching is essential for a standard to be maintained and that doctors should be prepared to teach as opposed to viewing it as a tiresome obligation. Doctors should advocate the passing on of knowledge to the generations of future practitioners.

The timeline below illustrates some of the major changes and factors affecting medical education within the last decade. The 1993 "Tomorrow's Doctors: recommendations on Undergraduate Medical education" recognised the inconsistencies between expectations of different medical schools for students sitting their final examinations (Lewington 2012). This report recommended a shift towards a 'core curriculum'. The report has been revised twice since; in 2002 to 'replace guidance according to educational theory' (Webb & Maxwell 2002),and again in 2009.

Fig.1. Timeline of Medical Education from 1993-2012 (Lewington 2012)
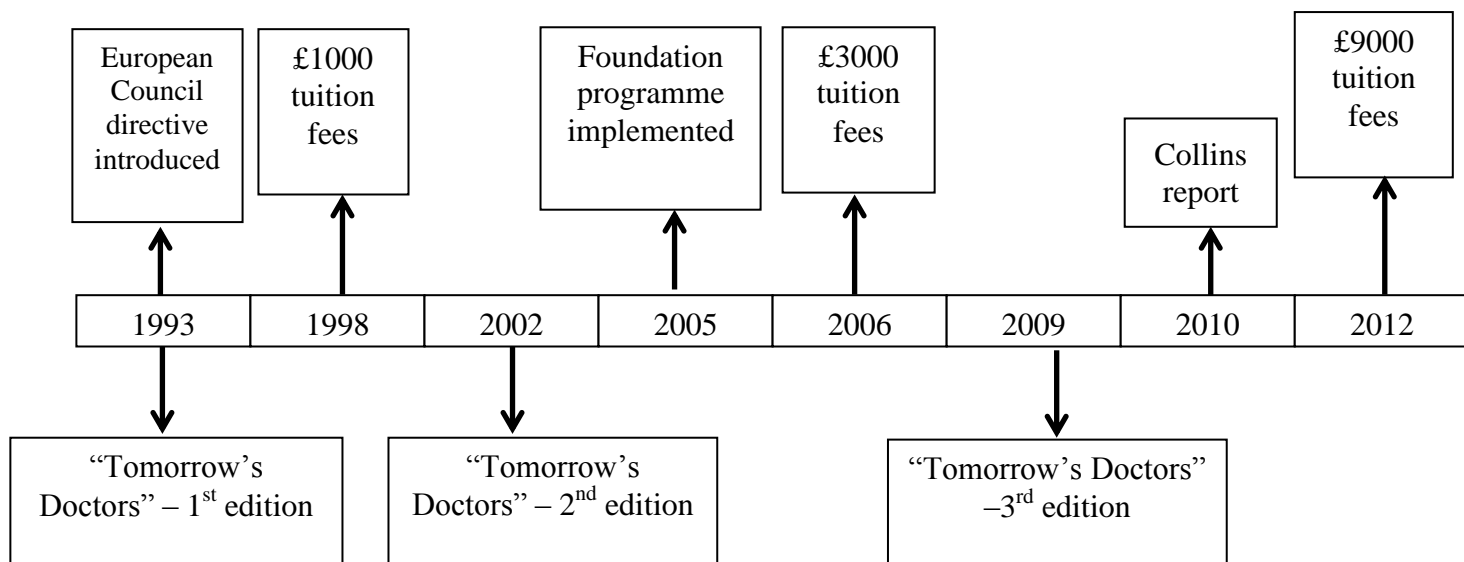
The implementation of the European Council directive 93/16 indicated that any European Union (EU) nationals holding a medical qualification could practice anywhere within the EU with a medical license. This greatly affected admission into UK medical schools, as previously competition for places from Europe was very difficult however after this directive was passed there was an influx of European students, peaking in 1997 (Lewington 2012). The competitive nature of the admissions process has caused concern between students about the true benefits of peer teaching including, in some cases, a language barrier becoming problematic. The Collins Report 'Foundation for Excellence: An Evaluation of the Foundation Programme' raised concerns about the difficulties of balancing the provision of a gold standard service and learning simultaneously (Lewington 2012). Whether it was intentional or not, the implementation of the Foundation Programme has become a large part of PAL by encouraging doctors to supervise their juniors. Many current 5th year students cite the teaching received from the Foundation doctors to be fundamental to their learning on clinical placement.

Hippocratic Oath and Medical Education

Historically, doctors, recite the Hippocratic Oath as a rite of passage marking their graduation. They were to swear upon the healing gods to uphold certain ethical standards when practicing. The oath is of Greek origin and considered to hold tremendous traditional value for all physicians. Hippocrates is often acclaimed as the 'father of medicine' within Western culture as he became the first physician to promote naturally occurring disease as opposed to disease caused by superstition. He founded the first 'medical school', revolutionised medicine as a discipline in its own right and established it as a profession. The oath covers many medical ethics areas i.e. doing no harm, preserving life, confidentiality and can be apportioned into 12 subject areas.

A modern adaptation of the oath, the Declaration of Geneva, is now most commonly used by medical schools. The modification took place after World War II in 1948 following rising concern of the medical ethics used during Nazi occupation of Germany.

The most relevant areas for this thesis are the 'Covenant with Teachers' in which physicians are pledging collegiality of new ideas and secondly the 'Commitment to Students' whereby the promise to teach all others who swear the oath. Both of these pledges are both found in the second paragraph of the original document

Fig.2. The original Hippocratic Oath (F. Kleisiaris, Sfakianakis & V. Papathanasiou 2014)

<u>Original Hippocratic Oath</u>

I swear by Apollo, the healer, Asclepius, Hygieia, and Panacea, and I take to witness all the gods, all the goddesses, to keep according to my ability and my judgment, the following Oath and agreement:

To consider dear to me, as my parents, him who taught me this art; to live in common with him and, if necessary, to share my goods with him; To look upon his children as my own brothers, to teach them this art; and that by my teaching, I will impart a knowledge of this art to my own sons, and to my teacher's sons, and to disciples bound by an indenture and oath according to the medical laws, and no others.

I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone.

I will give no deadly medicine to any one if asked, nor suggest any such counsel; and similarly I will not give a woman a pessary to cause an abortion.

But I will preserve the purity of my life and my arts.

I will not cut for stone, even for patients in whom the disease is manifest; I will leave this operation to be performed by practitioners, specialists in this art.

In every house where I come I will enter only for the good of my patients, keeping myself far from all intentional ill-doing and all seduction and especially from the pleasures of love with women or men, be they free or slaves.

All that may come to my knowledge in the exercise of my profession or in daily commerce with men, which ought not to be spread abroad, I will keep secret and will never reveal.

If I keep this oath faithfully, may I enjoy my life and practice my art, respected by all humanity and in all times; but if I swerve from it or violate it, may the reverse be my life

Liverpool Curriculum

The curriculum of 2013-14 discussed in this thesis has evolved since the original PBL based curriculum introduced in 1996. Although the principles underpinning the curriculum are predominantly the same, there has been a natural progression of evolution, as you would expect in a system that has been in place for more than ten years. Within medicine it is generally accepted that McMaster Medical School, Ontario (Neufeld & Barrows 1974) 'founded' the original PBL curriculum where the emphasis lay on 'rebranding' learning as an enjoyable activity whilst using educational theories. The previous traditional curriculum was concentrated on the factual objective, clinical skills and anatomy teaching however the delivery was largely lecture based. The 1996 curriculum supports the PBL philosophy as the main method of learning as opposed to traditional lectures in order to improve skills of self-directed and critical learning. Part of the ethos of PBL is to build on previous knowledge, laying down foundations of knowledge to aid long-term memory as opposed to a lecture based deliverance of knowledge without reinforcement of the basics (Watmough 2008). Although PBL and PAL are by no means synonymous terms, there is a degree of synergy between them. PBL is particularly relevant to PAL as it aids PAL by providing the opportunity for peers to teach each other in a supportive group environment. The tools for PAL are almost co-existent with PBL.

The University of Liverpool have modified the "Seven Steps" PBL approach from University of Maastricht (formerly the University of Limburg) for their current curriculum. The seven steps are:

1. Clarify terms

2. Define the problem

3. Analyse the problem taking into account the data presented

4. Suggest hypotheses

5. Identify learning objectives

6. Self-directed study

7. Report back to original session

PBL tutorials are divided into two week modules where each module is guided by a clinical case on a certain system or group of diseases. This approach is used from Years1-4 with the Year 1 focus purely on "normal" functions of the body before introducing the concept of disease in Year 2. The topics introduced in Year 2 are reinforced in Year 4.

The students are placed into clinical placements from Year 2 but are enrolled into weekly practical sessions in the Clinical Skills Resource Centre from the first week in medical school. History taking and examination skills are taught and subsequently assessed at the end of each year by an Objective Structured Clinical Examination (OSCE) which simultaneously evaluates both their communication skills and professionalism.

PBL is supplemented by daily plenary sessions in Year 1, timetabled anatomy teaching in the Human Anatomy Resource Centre and the regular use of the Clinical Skills Resource Centre as mentioned above.

Table 1, shown below, illustrates the reformed PBL based curriculum implemented in 1996. Many similarities can be seen between the curriculum in 1996 and the curriculum in place in 2013-14 (shown in Table 2). The outline of the Liverpool curriculum in 1996 and in 2013-14 is very similar.

Fig 3. Outline of Liverpool curriculum 1996 (Watmough 2008)

Key	Φ = Phi = Formative assessment
	Σ = Sigma = Summative assessment

Phase one Normal structure and function Year one	PBL Communication Skills Clinical Skills, HARC Daily Plenary Sessions Optional: Lab Practical		Φ 1	SSM 1	PBL Communication Skills Clinical Skills HARC		Daily Plenary Sessions	Σ 1	
Phase 2 The human life cycle									
Year 2	PBL Plenary Sessions Clinical Practice	SSM 2	PBL Communication Skills Plenary Sessions Clinical Practice	Φ 2	SSM 3	PBL Plenary Sessions Clinical Practice			Φ 2
Year 3	SSM 4	PBL Clinical Practice	PBL Clinical Practice			Σ 3	PBL Clinical Practice SSM 5		Elective
Year 4	PBL Clinical Practice			Φ 4	PBL Clinical Practice			Σ 4	SSM 6
OPPORTUNITY FOR INTERCALATION									
Phase 3 - INTENSIVE CLINICAL EXPERIENCE									
Year 5	COMP (including Communication Skills) 2 x SAMP (Opportunity to undertake Erasmus Exchange x 1) A&E Ward 5 Rotations (8 week blocks)								

Fig 4. Outline of Liverpool curriculum 2013-14 – Years 2-5

Year	Focus	Summary of components
2	General medicine/surgery	2 days of clinical attachment in hospital 2 days of lectures 3 PBL session in 2 weeks HARC availability
3	Specialties Obstetrics & Gynaecology, Paediatrics, Therapeutics, Disability, Psychiatry & Neurology,	7 week rotations Critical Thinking Module (CTM) group work 3 PBL sessions per module
4	General medicine/surgery & Specialties	8 weeks surgery, 8 weeks medicine, 8 weeks specialties 3 PBL sessions per module Elective placement
5	A&E, Ward shadowing, General Practice and 2 student selected modules Prescribing/Vocational	7 week rotations Portfolio – histories, examinations, procedures and competency levels signed off by consultant

Unlike the majority of medical schools, students at Liverpool undertake their "final" exams in Year 4 not Year 5. The exams consist of three written papers, an OSCE and a practical examination specific to Liverpool; Liverpool Objective Clinical Assessment (LOCAS)

The LOCAS exam is not dissimilar to an OSCE however; the patients are not simulated and have often have physical manifestations of a disease that the students are expected to elicit. The students have eight minutes to obtain a history or perform an examination followed by four minutes of questioning from the examiner, a consultant. The examiner cannot be a specialty in that field of medicine i.e. a station on vascular examination cannot be assessed by a vascular surgeon. This reduces 'specialty biases'. The final year is akin to an 'apprentice' year for Foundation Year where there are no internal examinations.

Two national exams are expected to be taken by final year students. The Situational Judgement Test (SJT) was developed and piloted in 2010-11, an exam that tests elements of 'practical intelligence' and promotes the importance guidance of the General Medical

Council. The Prescribing Safety Assessment (PSA) prepares the students for the challenges of prescribing as a junior doctor. Liverpool uses a portfolio and appraisal system for assessment of the final year – Professional Education and Training Appraisal (PETA). Final year students are expected to shadow their Foundation Year peers in an Accident & Emergency placement, a ward shadow, a General Practice attachment and two student selected modules. Each placement is for seven weeks. This year is implemented specifically to prepare the students for the transition from medical student to Foundation Doctor.

Mature students with previous degrees are also admitted onto the 5 year course; however, there is an option for graduates to enter an alternative programme that shortens the course by a year, thus becoming a 4 year course. For the latter, Year 1 is compressed into August to December of their first year. From January of their first year they join the current Year 2 students as 2nd year students. Entering into that cohort at Year 2 level in January they will then follow the same progression as that Year 2 cohort.

On completion of final exams in Year 4 students can elect to suspend their studies within the medical school for one year and take the opportunity to undertake an intercalated degree. The courses available for intercalation are dependent on university. Internal applications to courses i.e. BSc Pharmacology and MSc Humanitarian Studies in University of Liverpool are popular however students are also permitted to apply to other universities that offer intercalated degrees that Liverpool do not offer i.e. Medical Ethics and Law at King's College in London. The degree should be completed within a year before students return to their final year to complete their MBChB degree.

The 2013-14 Liverpool curriculum did consist of existing PAL opportunities, both informal and formal. Informally, students often engaged in peer tutoring with students they had met during extra-curricular activities and several students participated in the mentoring system set

up by the student society either in a mentoring or a 'mentee' capacity. Teaching within hospitals is common with certain trusts though not available in all trusts. Formally, a mentoring programme officially affiliated with faculty was implemented in which students were randomly paired via email. The specifics of this system and its outcomes will be discussed in detail in later chapters. As mentioned above, the curriculum uses a PBL approach where PAL is an important part of the process. In addition to the participation of PBL, final year students are permitted to facilitate PBL sessions if they wish, undergoing a short training course. Students are also encouraged to use PAL as a method of teaching during UCCT sessions to engage the group and make the session interactive.

<u>Curriculum Review</u>

The curriculum was reformed from a traditional curriculum to an integrated Problem Based Learning curriculum in 1996.

A review of the curriculum was undertaken in the academic year 2008-09 ' Curriculum Review Research Report' which highlighted some problems. This curriculum review was conducted under the supervision of Dr Simon Watmough (SW).

One outcome of this review was the issue of the structure of the new curriculum i.e. reinforcing the perception that Liverpool students weren't particularly strong on their knowledge of biomedical sciences. However, another outcome of the report reinforced the view that the PBL process should be 'developed and enhanced in order to deliver a patient-based curriculum', indirectly encouraging the use of PAL within the curriculum for example, PAL encourages skills such as communication that are increasingly important in a patient based curriculum (Watmough 2009).

As a result of the concerns expressed in the 2008-09 review and the appointment of a new dean in 2012, a further curriculum review was undertaken in 2012/14 (Jha et al. 2014).

As the curriculum has been undergoing a review at the time of this thesis, this thesis is particularly relevant for the current evaluation of the curriculum.

<u>Data collection methods</u>

Data in this thesis was collected in a number of ways:

- Literature review was done to gather initial data on PAL

- Ethical approval form was submitted, containing a small literature review and subsequently approval gained in October 2013.

Two qualitative methodologies were used to gather general views and inform the development of the questionnaire:

- Focus groups were held with undergraduate students from 2nd-5th year to enquire if they could define PAL, whether they had experienced PAL in medical school and how it could be improved in the current curriculum.

- A nominal group was held after the focus groups. Themes generated from the focus groups were used to compose a concise list of items students felt most important to them in the areas; defining PAL, improvements for the curriculum using PAL and benefits of PAL.

One quantitative research method was used:

- Questionnaires were distributed to students in 2nd-5th year in the form of an online survey. Paper copies were made available at certain hospitals. The questionnaires were based on the experiences, improvements, barriers and advantages of PAL discussed in all focus and nominal groups. A mix of Likert scale, open and closed answers were required.

A full explanation of the reasons for selecting the above methodologies and the process of analysis is included in chapters three and four.

<u>Framework of MPhil</u>

This innovative Masters in Philosophy in Medical Education is a one year long project that is the first of its kind within University of Liverpool (UOL). The researcher worked with supervisors within School of Medicine of UOL to find an area of interest that required a study to be undertaken relevant to the current undergraduates and of curiosity of the author. Having discovered a particular interest in Peer Assisted Learning it was decided to perform a literature search in order to gauge the level of research that had already been commenced. A study on the benefits of Peer Assisted Learning had not been done recently nationally, or at all, regionally. The supervisors were able to guide the researcher in choosing an acceptable and manageable project from this point forward.

The requirements of the MPhil were to:

- o Conduct piece of research with approximately 6 months of data
- o Produce a 60,000 word (maximum) thesis
- o Assessments included:
  - Two presentations – Post Graduate Research Conference Day and Seminar for Institute for Learning and Teaching
  - Viva with an internal examiner from Liverpool University and external examiner from Lancaster Medical School

Author's position

I have been a medical school undergraduate of University of Liverpool since September 2009. I have undertaken the 5 year A100 course and did not defer a year between leaving school as an A level students and beginning this degree at Liverpool. I have not undertaken any other degrees prior to beginning this course. I have suspended my studies within the Medical School in August 2013 to commence a full-time intercalated year in Medical Education (MPhil) and will return to the final year of my MBChB degree in September 2014. Previous to this study I have not undertaken research of this nature and have discovered new research methodologies and analytical techniques throughout the work undertaken for this thesis.

My decision to undertake an MPhil in Medical Education was not taken lightly. I understood that there was a vast amount of work needed to complete a Master's degree. However, having discovered an area of education that was both interesting and had not yet been researched in Liverpool in depth I was keen to undertake this project. I have relished the opportunity to hone my skills in reviewing literature, supervising focus groups, undertaking large-scale research and producing a thesis. Using my background in the medical sciences and looking through the lens of scientific research I have integrated my skills from both areas. I hope to take these skills I have learnt into my future career with the possibility of becoming an academic specialising in Education.

<u>Author's reflections</u>

To demonstrate the credibility of the research presented in this thesis it is pertinent to acknowledge the researcher perspective when reading and analysing all data collected during this project. Reinharz (1992) has highlighted the necessity to make clear these perspectives in order to demonstrate total transparency (Reinharz 1992). As an intercalating medical student that entered Liverpool Medical School in 2009, the researcher has spent most of her time in the curriculum using Problem Based Learning as the educational philosophy of the course.

Although I recognise that there could be a possible bias when interpreting the results I have strived to be objective throughout the collection, analysis and discussion of data used in this thesis. I have thoroughly enjoyed the layout and format of the course throughout my five years in the course and appreciate the skills I perceive I have gained from learning in the PBL curriculum. This opinion has not been used to promote or market the PBL curriculum in any way. In the same manner, I have not let opposing beliefs sway my judgement and interpretation of the data and endeavour to present the following results in an objectified and fair fashion.

The rationale and basis to undertake this study discussed in this thesis has been identified above alongside a brief summary of the guidelines pertaining to medical education in the UK. The thesis will be briefly summarised below.

Chapter two will examine the existing literature on PAL, comparing the experiences of PAL within medication education in the UK to that of their global compatriots. Specifically, it will assess the perceived benefits of PAL relating to medical education. It will look briefly at the current theories of learning and how this thesis will add to the body of research surrounding PAL.

Chapter three looks at the chosen research methods used in this thesis. The recruitment of the focus and nominal groups will be explained, the development and distribution of the questionnaires and how both qualitative and quantitative data was analysed. The processes of validation and triangulation will also be studied.

Chapter four reviews the results of both focus and nominal groups including quotes from students in each section, summarising the major points from each discussion. The development of themes generated in the focus and nominal groups used to inform the questionnaire will be discussed.

Chapter five discusses the results of the questionnaire using a variety of visuals including graphs to illustrate the quantitative data and quotes to clarify data taken from the qualitative

areas. The trends generated from using the statistical programme, SPSS, will also be discussed in this chapter. The outcomes of these results will be discussed in chapter six. Chapter six considers the outcomes of the results from chapter four from all methodologies and looks at the interpretation of the analysis of data. The limitations for each method will also be examined and a PAL scheme in Manchester, mentioned by one of the graduate entry students, will also be explored. Considering the results, this chapter will also deal with the integration of these results into the current literature base and where in the body of research it will be accepted.

Chapter seven concludes this thesis by summarising the key points and examining the implications of this work. Recommendations for curriculum improvement and further study are discussed. This chapter has discussed the background of medical education in the UK, the current Liverpool curriculum and where PAL fits into both these existing categories. The data collection methods and authors standing have been outlined. The following chapter will summarise the literature review undertaken.

Chapter Two – Literature Review

This chapter explores the definitions of PAL, the existing literature base and the outcomes of the existing research in relation to peer learning. The benefits and barriers surrounding PAL will be discussed in conjunction with the existing educational theories of learning. The evaluation of peer learning and the methodologies discussed in this thesis will also be reviewed.

Definition of PAL

KJ Topping (1996) has described peer learning as the 'acquisition of knowledge and skill through active helping and supporting among status equals or matched companions' and this can be simplified into 'people of similar social groupings who are not professional teachers helping each other to learn and learning themselves by so doing' (Topping 1996). He is one of the most significant and initial researchers of peer learning who has suggested many representations of peer learning.

A literature search of the following databases; SCOPUS, OVID, MedLine, PubMed at the University of Liverpool was performed. Search terms included 'peer assisted learning', 'medical education', 'peer teaching or tutoring'. The inclusion criteria consisted of the paper being in English, available through the University programme without financial subscription and an accessible full text.   The literature suggests three approaches to searching outcomes of PAL; pertaining to the evaluation and appraisal of peer learning; outcomes from the perspective of the student being taught, the student acting as 'teacher' and curriculum appraisal at an institutional level of the medical school.

A systematic review conducted by Tzu Chieh-Yu et al (2011) assessed peer-assisted teaching during medical school, from which four statements were used provocatively in the focus groups (Cross Reference Chapter 4). Search terms eventually revealed 19 appropriate articles that had measurable study outcomes that could all be assessed using 'Kirkpatrick's levels of learning' as an appraisal tool to score the extent of impact on learning (Kirkpatrick 1959). The rationale for this study was to identify previous studies that were able to prove a quantifiable change in learning outcomes instead of simply the perceived transformation. Assessable outcomes included written examination, observed clinical examinations however self-evaluation and satisfaction rankings were disregarded as 'measurable'. All studies within this review had an objective outcome. In this instance, the Kirkpatrick model was modified to evaluate outcomes for both students learning and those that taught. It has been used to evaluate curricula and has been used in University of Liverpool in 2008 by Dr Simon Watmough (SW) to appraise the curriculum reform from a traditional curriculum to a problem based learning curriculum.

The Kirkpatrick model (1959) advocates the classification of curriculum evaluation into four stages. The first stage observes the administrative factors relating to the teaching i.e. the satisfaction of the students whereas stage two assesses the effect of the curriculum format on student learning. The methods of conveying knowledge and practical skills i.e. in case of Liverpool, early clinical skills introduction followed by early clinical contact in second year. Stage three evaluates the degree of behavioural change in a learner as direct impact of the course and finally, the overall impression of the course made on the final 'product'. For example, the basic science knowledge of Foundation doctors graduating from the traditional curriculum in comparison to an integrated PBL course (Watmough 2008).

This thesis is concerned with stages one and two of the Kirkpatrick model of curriculum evaluation. Students have been asked what their views of PAL in the curriculum are (Stage 1) and the questionnaire is used to assess the effect of the PAL opportunities have on student learning (Stage 2).

Yu *et al* (2011) concluded that objective learning outcomes suggest an equivocal if not beneficial correlation between outcomes using PAL and that of conventional faculty-led teaching. However, they state that PAL must be executed in a 'highly selective context' which is not explained in the review. The learning outcomes of student- teachers were favourable and it has been insinuated that medical schools may utilise this conclusion to respond to the increasing number of medical students against the shortage of faculty resources (Yu et al. 2011). Vaughan and Baker (2004) also suggested, like Yu *et al* (2011), that student teachers would appreciate a syllabus or guidelines to teach from (Leach et al. 2004). There was a deficiency of articles reviewed that explored the long term impacts of peer teaching or the non-academic influences peer teaching can have for example, leadership, decision making and professionalism.

The use of PAL in relation to practical skills has been examined by Graziano (2011) in United States, specifically in theatre. Sixty-three 3rd year students were randomly allocated to a simultaneous teaching session led by a 'residents', the equivalent of a registrar, or 4th year medical students. One hour was didactic, highlighting safety issues, followed by a practical 30 minute session where they were taught the protocol for entering an operating room and the beginning of a surgical procedure (an abdominal hysterectomy). The protocol involved identifying the correct patient, marking the surgical site, positioning of the patient, performing a pre-operative pelvic examination and the aseptic technique for 'scrubbing in'.

All students were assessed using an OSCE format, examined by a faculty that was blinded to allocation. The PAL cohort scored higher than those taught by the 'residents' and allowing for previous surgical experience the PAL group still performed more steps correctly, though not statistically significant (Graziano 2011). Prior to this study peer teachers had not been directly compared to qualified clinicians and proves that medical students are effective teachers although not superior. This could be explained by an ability to provide 'level-appropriate' knowledge because they are closer to the 3rd year experience than the residents (Graziano 2011). This study supports the views that peer teaching curriculums can subjectively increase students comfort with future teaching roles (Graziano 2011; Pasquale & Pugnaire 2002).

The University of Dundee (Muir & Law 2014) implemented a specific intercalated degree to 'provide learning opportunities for medical students in medical education and research methodology', having recognised a need for training in teaching students how to teach. Muir and Law (2014) instigated a 1 year full-time BMsc (BioMedical Science) entitled "Teaching in Medicine" in 2010, of which 13 students participated, and reviewed the degree using students' views in subsequent years. The students were permitted to commence the course having completed 3rd year. The aims of the course were defined by staff that had completed a Master's in Education, who outlined aspirations of the course as having a general understanding of basic research methods, acquiring the knowledge/skills to undertake a research project using specific educational methods. The course was divided into theoretical background and a supervised educational project in addition to assessment in the format of written coursework, reflective teaching portfolio and a dissertation. The article was not specific when declaring the use of 'theoretical educational lectures' and what this entailed. The results were positive, nevertheless the students were self-evaluating their performances

and results were mainly reflective accounts. However, this study does support the view of Foster and Laurent (2013) who consider doctors have a better understanding of 'basic educational theory' and its clinical applicability to teaching following an interactive course (Foster & Laurent 2013). This can clearly be extrapolated to medical students. Again, the researchers are elusive when describing what 'basic educational theory' involves.

The researchers at the University of Manchester have acknowledged that whilst the concept of PAL is not new, it is a recent development for medical education. Hill *et al* evaluated the current PAL system in place at the Salford Royal Trust, where a student-led programme for students in Years 3-5 specifically designed for clinical skills has been employed for 6 years. The programme has expanded to include students themselves, student-teachers and student co-ordinators of the scheme, where all teaching material are reviewed by consultants previous to teaching. The article examines the above three perspectives in a reflective case study (Hill, Liuzzi & Giles 2010).

The student learner by her own admission was apprehensive prior to the session furthermore had experienced a consultant led session on the same topic recently and had low expectations of the session. In spite of this, the overall experience was successful. She felt that the topic was well-prepared, the teacher had sufficient knowledge; the session was relatable and engaging with the addition of basic science that had not been included in the consultant led session (Hill, Liuzzi & Giles 2010).

There was also anxiety from the student teacher who was apprehensive about the level of key knowledge needed to deliver a sufficiently valuable experience. The goal of undertaking this role was to improve presentation skills and develop teaching. The teacher was surprised by

the level of knowledge and the volume of discussion generated by the informal environment (Hill, Liuzzi & Giles 2010). The popularity of the programme was increasing and it was not made clear what the selection process involved in order to become a student-teacher or a student co-ordinator. At a baseline level, this reflective case study corresponded with the ideas of (Boud, Cohen & Sampson 1999) where the benefits of an educational tool are extended to the teachers themselves and the institution.

PASS (Peer Assisted Study Scheme – Manchester)

One graduate entry student disclosed a peer learning experience that had not been mentioned in the questionnaire, whilst doing their previous degree at the University of Manchester. Peer Assisted Study Sessions (PASS) was established in the 1990s by Jenni Wallace, a researcher for Kingston University, as an adaptation of the 'Supplemental Instruction' (SI) model. Dr Deanna Martin first developed 'Supplemental Instruction' in 1973 at the University of Missouri, Kansas City (UMKC) in order to reduce the attrition rates of students in health care. PASS was adapted the name and structure, Jenni Wallace introduced the programme into British Higher Education Institutions. The Department of Chemistry at the University of Manchester was the first field in 1995 to introduce PASS to stimulate peer facilitated academic discussion. Students volunteer to undertake the training, becoming 'PASS Leaders' in order to develop leadership, communication and time management skills with the opportunity to reflect and evaluate their performance.

The literature surrounding PAL, concentrates mainly on enabling the learning process of 1st year students in a fashion similar to PBL, where the 'leaders' are not actively teaching them but 'facilitating' a session by guiding a group discussion. The primary difference of

PASS to PBL is the lack of a 'problem' to 'solve'; there is no case from which they set their objectives however the discussions are set by topic.

Silbert and Blake (2012) looked at medical education in Australia. They evaluated the teaching of physical clinical examinations using peer learning (Silbert & Lake 2012). This was in contrast to the previous studies on peer learning concerning theoretical and technical skill teaching (Durning & ten Cate 2007; Pasquinelli & Greenberg 2008; Ross & Cameron 2007). A training course designed to train qualified clinicians to teach 'Teaching On The Run' (TOTR) was modified and adapted for students within this project to focus on skills required to teach clinical skills using PAL. The social and cognitive congruence between students who have no formal training is thought to be an aid, inferring that if students were to receive the same baseline training, the congruence would still be applicable however the overall level of teaching would advance.

An evaluation of 'students as teachers' (SAT) programmes were undertaken in United States in 2008 where it was found that formal training programmes existing in 43 of 99 US medical schools, although all schools used medical students in an assigned educational role i.e. mentor, tutor or contributor to curriculum design (Soriano et al. 2010). A 'formal' programme was defined as "course where students must register and receive course credit, complete some type of classroom education that focuses on teaching skills training". There was a wide variety of programmes; some were elective, a one-off workshop, and periodic sessions over the academic year or integrating it throughout the 4 years of undergraduate training in one case. Assessment of each programme and the student teachers was performed through OSCE, self-evaluation, direct observation or faculty evaluation. Each school was asked to identify the benefits and barriers they felt their programmes had. The benefits listed

below are in order of those declared most to least: development of future physician-educators, enhancement of medical student learning, providing teaching assistance for faculty, contributing to curriculum development, enhancing teaching effectiveness and strengthening student-teachers' clinical skills (Soriano et al. 2010). It is interesting to note that many curricula used the programme to provide "teaching assistance". The most common barriers cited were competition between other educational demands and difficulty in recruitment of faculty. Only 6 schools cited "lack of commitment of medical students" as a barrier, reinforcing the feeling that students are eager to participate in a teacher training programme (Muir & Law 2014).

On an institutional level, the Association for Medical Education in Europe (AMEE) have produced 'Peer assisted learning: a planning and implementation framework: AMEE Guide no.30' by Ross and Cameron (2007). It is based on Topping's (2005) typology for peer learning, consisting of 24 questions that should be answered whilst thinking about the implementation of a peer learning programme. The authors have used experiential knowledge from time at University of Edinburgh and evidence in the literature to compose this guide. The guide has referenced Bales' Learning Pyramid. This is a hierarchy of teaching methodologies which has ascertained that listening to lectures is a passive activity resulting in only 5% recall. Teaching other students conversely leads to 90% recall (Ten Cate & Durning 2007a).

Fig. 5 Bales' Learning Pyramid (Ten Cate & Durning 2007a)
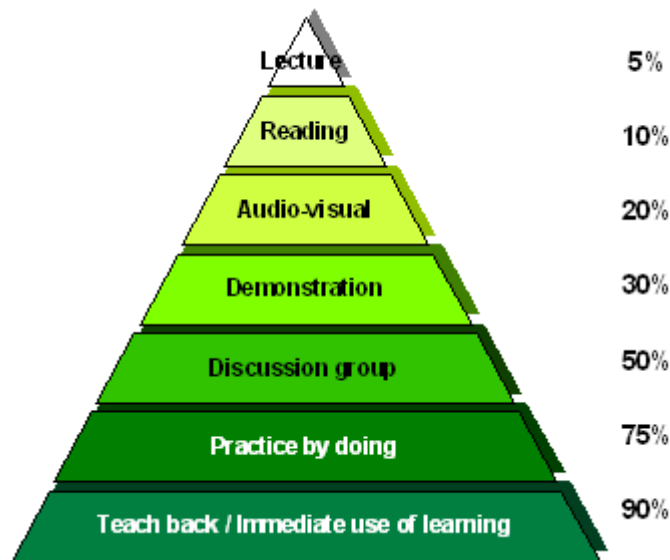
Ten Cate & Durning (2007) reviewed the literature published in 2006 to provide an impression of the 'state' of peer teaching in medical education and write a document discussing the reasons to implement peer teaching in a medical curriculum (Ten Cate & Durning 2007b). The review lists twelve reasons. Of the twelve, the most interesting to note were:

1. To offer education to students on their own cognitive level

The theory of cognitive congruence has been used may times and is especially relevant to PAL. Lockspeiser *et al* (2006) have suggested that the value of a large 'cognitive distance' is important for effective learning inferring that having a peer teacher who is one to two years senior is most beneficial for the student learner (Lockspeiser et al. 2008). Students consider peers to be closer to them than faculty members and prefer to discuss conceptual problems because they are able to visualise the reasons for difficulty. Faculty teachers are unable to understand the challenges as the knowledge has become innate and are less able to explain concepts at an appropriate level.

2. To create a comfortable and safe educational environment

An environment in which students are able to make mistakes and be corrected without embarrassment is a positive learning climate. Peers are well-equipped for this type of environment as they have a rich understanding of the potential stresses of the curriculum both socially and academically (Lockspeiser et al. 2008).

3. To offer students an alternative motivation as well as another method for studying

The literature suggests that when teaching others, students not only "learn twice" but learn in a different way, resulting in consolidation and retention of knowledge (Ten Cate & Durning 2007b). The fear of imparting incorrect knowledge or a session that is dull serves as motivation for the student teacher. In addition to the knowledge needed to effectively deliver a teaching session the phase of preparation may also stimulate high levels of understanding.

4. To enhance intrinsic motivation in students

The "self-determination theory" predicts that students within a teaching role will develop an 'intrinsic motivation' when assuming a teaching role (Pintrich 2003). Ten Cate & Durning (2007) attribute these to the feeling of "competency", "autonomy", and "relatedness" being optimised when acting as a teacher rather than passive learner (Ten Cate & Durning 2007b).

5. To prepare clinicians for their future role as educators

Dandavino *et al* (2007) have argued that there is a growing consensus among the medical education community that doctors need to become educators (Dandavino, Snell & Wiseman 2007). This is echoed also by document released by GMC 'Tomorrow's Doctors' (2009) that encourages medical student to take an active role in teaching (GMC 2009). The 'identification' of clinicians as teachers is important as this recognition may influence their

desire to teach, improve teaching skills and ultimately enhance student learning (Dandavino, Snell & Wiseman 2007).

Ten Cate & Durning (2007) have also explored the 'psychology of peer teaching' (Ten Cate & Durning 2007a) using several established theories. They have applied the theories listed in the table below, dividing the benefits in terms of the student teacher and the student learner.

Fig 6. Classification of theoretical perspectives on peer teaching (Ten Cate & Durning 2007a)

	Postulated benefit for the student being taught	Postulated benefit for the teaching student
Cognitive and metacognitive level of learning	Cognitive congruence	Goal-orientated information processing and verbal elaboration
Affective and motivational level of learning	Social congruence	Role theory and adjoining theories

Learning can be viewed as the extension of an existing knowledge base (Ten Cate & Durning 2007a) whilst Lindsay & Norman (1977) view the organisation of information in long term memory as a ' semantic network of concepts and relations between them' (Lindsay & Norman 1977). Their opinion is that learning is an adjustment of that network by: accretion (adding information), restructuring (modification of cognitive schemas) and tuning (fine adjustments for adequacy and efficiency). By extension they believe that learning is the adjustment of a prior knowledge base and teaching is an aid.

Cognitive congruence between peers means that the semantic network of a peer more closely resembles that of the learner than a faculty member therefore able to help more effectively. It

enhances the rate of information processing of the student learner. Vygotsky (1978) attributes optimal learning to be when the distance between what is presently known and what is to be learned is just enough to 'stimulate active inquiry'. This distance is called the "zone of proximal development", inducing a constructive cognitive friction (Ten Cate & Durning 2007a; Vygotsky 1978). Topping (2005) claims that peers may sense this 'zone' more easily than 'experts' who may not have understood the cognitive problems students experience when processing new information (Topping 2005). Application of the role theory was confirmed by Lockspeiser *et al* (2006) where the students consider peers as role models, building confidence by thinking "the 3rd years made it, if they know this, I can do it too" (Lockspeiser et al. 2008). Social congruence can lead to a more personable attention from the learner who is appreciative of the social similarity they share with the peer (Ten Cate & Durning 2007a).

The cognitive strategies employed by students when preparing for an individual exam in comparison to when preparing for a teaching session are different (Ten Cate & Durning 2007a). In anticipation of the exam, the student is predicting what the questions will be and tailoring their revision towards that purpose however, when preparing a teaching session, the goals of the session are determined by themselves. The anticipation lies in the questions they might be asked. Therefore when revising for an exam, the student has no control on the context of memory retrieval but does have control over the context when teaching. The ability to set personal objectives has been recognised by many as being important for learning and is also a key component of PBL (Bruner 1977; Schmidt 1983). All of the above supports the idea that there are both theoretical and practical benefits for the acquisition of knowledge through peer teaching and learning.

Using qualitative and quantitative data

This thesis uses multiple research methods. Sale *et al* (2002), Stiles (1993) and Watmough (2008) have maintained that it is possible to use "critical multiplism" to combine both qualitative and quantitative methods for triangulation purposes and that triangulation should be applied to all phases of research; measurement, data collection and analysis (Sale, Lohfeld & Brazil 2002; Stiles 1993; Watmough 2008). The use of one research methodology cannot guarantee diligence and the bias of each method can be reduced should a multitude of methods be employed (Watmough 2008).

Quantitative vs. qualitative methodologies

Previously, a combination of methods has been criticised. However the reasons for using both methodologies are prevalent in the literature (Sale, Lohfeld & Brazil 2002). Firstly, the combination of two or more sources of data to study the same phenomena in order to gain a more complete understanding of it (Denzin 2006). Secondly, using the strengths of one method can enhance another method and produce complementary results (Morgan 1998). Although the primary aim of the focus and nominal groups were to inform the questionnaire development they have created useful data in their own right and can be triangulated with the data collected in the questionnaire, particularly the qualitative sections.

There are many definitions of triangulation. It is typically perceived as a strategy used in research for improving the validity of research and evaluating findings with an "assumption that using a strategy will result in convergence on a single perspective of a social phenomenon" (Mathison 1988). In fact, this is not entirely possible and researchers often utilise contradictory as well as convergent findings to understand results. Mathison (1988)

asserts that the value of triangulation is not as a technological solution to problems of data collection/analysis but provides "better evidence to construct meaningful propositions from existing data" (Mathison 1988). The aim of triangulation is to provide evidence from which the researcher can construct a feasible and understandable explanation of the phenomena which has arisen. A full discussion of using the quantitative and qualitative methodologies as applied to this thesis is included in chapter 4.

Quantitative research concentrates on finding a specific answer to a specific question – often using mathematical and statistical analysis to produce numbers to demonstrate reliability and accuracy. Aliga & Gunderson (2000) define it as 'Explaining phenomena by collecting numerical data that are analysed using mathematically based methods' (Muijs 2010).

Qualitative research is focused on the respondent perspective rather than the researcher using open-ended questions and often group interaction to generate a discussion that goes beyond the initial research question. A qualitative approach elicits a deeper understanding of the topic, forcing the participant to think further than they would completing a questionnaire (Watmough 2008). This type of research is usually driven more by the reasons why a respondent has reacted in a certain way rather than what they have responded with.

Summary

This chapter has considered some of the literature pertaining to PAL, theoretical and practical and outlined the results of different studies. This analysis has reviewed a wide variety of traditional quantitative and qualitative methodologies in medical education. It has been demonstrated that though individually each is verifiable, the amalgamation of focus groups, nominal groups and questionnaires is a distinctive methodology.

Having explored the various assessments of PAL in the literature; the distinctive combination of all three of the above methodologies will be used to identify any possible new themes relating to PAL, unique to the Liverpool curriculum.

Chapter Three – Methodology

This chapter will explore the two qualitative research methods used in this thesis; focus groups, a nominal group and the mixed quantitative and qualitative method, questionnaires. It will look at the justification of using these methods, the way that they interact with each other and the integrative advantages of using all three within the same body of research. The rationale and methods of triangulation will also be discussed. Recruitment for the focus groups and nominal group will also be examined as well as the validation and distribution of the questionnaires. The final section of this chapter will examine the results of statistical analysis.

<u>Ethics</u>

Ethical approval for this study was obtained from University of Liverpool Committee of Research Ethics. In preparation for ethical approval, a short literature review was undertaken to explain the rationale for such a study and details of data protection, collection, and recruitment of participants were included. Having submitted an application, there were some minor amendments that needed to be revised in order for full application to be accepted and approval granted. These amendments comprised small grammatical errors, inaccuracies in consistency of vocabulary and one incidence of implied explicitness was rectified. Initially, the information regarding 'debriefing' of the participants of nominal and focus groups was not explicit enough. Once the data was collated, transcribed and analysed the volunteers would have been made aware of the key themes of results. The nominal group would have been made aware immediately as the themes will have been determined by themselves. The focus groups were emailed a summary of key themes and the participants of the questionnaire invited to a short presentation. If there were any issues participants were asked to email VT directly

History of Focus Groups

Focus groups are a qualitative research methodology typified by utilising free dialogue within a group discussion in response to open-ended questions ((Kitzinger 1995). They are an efficient form of group interview that capitalises on communication by generating multiple responses in a short space of time using group interaction and discussion. Instead of the researcher expecting a response from each candidate in turn, they are encouraged to ask questions within the group, exchange anecdotes and comment on opinions they either disagreed or agreed with. This method is particularly good at exploration of how opinions are constructed, their knowledge of a subject and examine why they are of that opinion. Originally, this technique was used to explore the effect of television programmes (Landgraf 1957). Since then, it has become a popular method to assess the effectiveness of health education *(Kitzinger 1993; Ritchie, Herscovitch & Norfor 1994)*, investigate patient experience of disease and health services (Gregory & McKie 1991; Murray et al. 1994) and evaluate curriculum reform within medical schools (Watmough 2008).

There are many advantages to using this form of group interaction to produce qualitative data. Amongst them being that in a group, partakers tend to have the chance to explore and clarify views that might be more difficult to access in a personal interview. Participants are encouraged to use their own vocabulary and their attitudes can be more telling than the response itself. Those that are reluctant or intimidated by a one-on-one interview (Kitzinger 1995) may be encouraged by the group environment, and may find themselves less inhibited resulting in contribution from those that would not normally engage. There is no discrimination of those that are illiterate and can also outline the values or norms of the group. Data collected in this way is particularly perceptive to cultural norms and 'taboo'

subjects as the participants begin to feel more comfortable with their peers to broach these type of topics. The more confident participants pave the way for those less forthcoming to express their feeling and facilitate the discussion.

As no method of data collection is without its possible negatives, there are also some disadvantages to relying solely on focus groups as the basis of large-scale research. Whilst having a strong group dynamic with largely homogenous views is beneficial for analysis, it is a concern that the articulation of a certain 'norm' could suppress any individual dissenting opinions. The interaction between those dissenting voices and those with the overriding majority view can be interesting to note as it can show a fear of chastisement for not conforming for example. Confidentiality and anonymity cannot be guaranteed within the participants of the focus groups as it can be in a one-to-one interview (Geis 1986). Geis et al (1986) learnt that group discussions can generate more criticisms than individual interviews. The study found that there were more angry comments about the medical community due to reinforcement from the group. An environment that fosters the expression of criticism without inhibition and explores the different types of solution is invaluable if aim of research is for service improvement (Kitzinger 1995).This is especially important in populations where they feel particularly disempowered or feel that the negative comments generated are because of their own inadequacies (Morgan 1998).

Kitzinger (1995) identified seven aims that are achieved from the interaction between participants:

- Highlight the respondent's attitudes, priorities, language and framework of understanding

- Encourage research participants to generate and explore their own questions and develop their own analysis of common experiences

- Encourage a variety of communication from participants – tapping into a wide range and form of understanding

- Help to identify group norms and cultural values

- Provide insight into the operation of group social processes in the articulation of knowledge

- Encourage open conversation about embarrassing/taboo subjects and to permit the expression of criticism

- Facilitate the expression of ideas and experiences that might be left underdeveloped in an interview and to illuminate the research participant's perspectives through debate in the group (Kitzinger 1995).

<u>Focus groups</u>

Two focus groups were held. The study population was recruited from medical students from second to fifth year, including students currently intercalating. The first group contained four students of 4th years, current intercalating students and a 5th year whilst the second group contained seven students where there was a representative from each year group. The second group contained a male to female ratio of 2:5 whereas the first group was consisted of all female participants. The discussions were held during students' own free time in undergraduate medical school of the University of Liverpool. This venue was chosen for the proximity to the main centre of teaching for all medical students.

An email was sent to the entire student body, through which they were explained what the study would entail, and enquired if they were able to attend a short session to discuss their views on Peer Assisted Learning. The email explicitly explained the voluntary nature of recruitment. They were given a choice of three sessions to attend – the third session becoming the nominal group, and were allocated according to their availability with no guidance to random distribution of students for each session. A certificate of attendance and lunch was provided as an incentive for all attendees of the discussion groups.

The aims of the focus groups were to ask the students about their views on Peer Assisted Learning, whether they felt it was present in the current curriculum and how they would improve the system in relation to the current curriculum reform for example, 'What are your experiences of PAL to date?' and 'How would you improve PAL in the current curriculum?' (CF page 57). The questions and themes were to then be used as the basis of the main research method, the questionnaire. Using a similar baseline of research questions in all three research methodologies would prove useful when comparing results and for triangulation purposes.

Fig. 7. Baseline questions for the focus group sessions

<u>Questions asked in Focus Group 1 and 2</u>

1. What do you understand by the term peer Assisted Learning and how does it work?

2. What are your experiences of Peer Assisted Learning to date?

3. How you would you develop or improve peer assisted Learning in our current curriculum?

4. What are the barriers to Peer Assisted Learning?

5. 'Medical students with better understanding of teaching become better learners'

6. 'Teaching is essential physician-patient interaction, you become a more effective communicator from teaching'

7. 'Medical students interested in teaching will become future educators'

8. 'Exposure to teaching principles should be in a sequential manner from undergraduate level and continue in postgraduate education'

9. How do you feel about social media i.e. FaceBook, Twitter, DropBox in medicine?

10. Any other changes for Peer Assisted Learning or curriculum Review – any other comments you would like to add to the discussion?

The ideal number of participants within focus groups are between 5-7 people; enough to generate a discussion without a dominant overriding viewpoint and conversely, an excess of people would generate a discussion with distinctly different themes without reaching general consensus resulting in a difficult analysis and subsequent saturation of themes.

Of the 10 baseline questions listed above, questions 5-8 were statements taken from the a paper written by Yu *et al* in 2011 concerning the 'state' of PAL in medical education at that time. The four statements above were put to the students as they are written, directly from the paper as topics that could generate discussion and be potentially controversial.

<u>History of nominal groups</u>

Nominal groups are a more structured activity than focus groups. Group interaction is still important and encouraged, contributing largely to the outcome. However, the outcome is to produce a concise list of prioritised items in relation to the original research question as opposed to generating multiple themes from free dialogue.

The Nominal Group Technique illustrated above was first developed by Delbecq and Van de Ven in 1968 (Van de Ven & Delbecq 1972). NGT is a structured procedure for gathering information from groups of people who have insight into a particular area of interest (Gallagher et al. 1993). Initially, this technique was established in order to evade the perceived inefficiencies of group interaction i.e. focus groups. It was thought that dominating personalities often monopolised the sessions and the group ended up following one single train of thought. The theory of NGT was to encourage equal participation from all candidates involved with all voicing their opinions in the 'round-robin' phase where no items are discarded. There were doubts over the use of large groups using Nominal Group Technique but Lloyd-Jones et al demonstrated that this problem was overcome by compiling a questionnaire based on the NGT items which was distributed throughout the class using medical students at University of Liverpool in October 1996. The purpose was to explore consumer perspective in a way to combine both qualitative and quantitative elements which allows the participants to create and prioritise items with minimal influence from the researcher. It is primarily participant led session until the final compilation of items which is led by the researcher.

Through combining both techniques of focus and nominal groups the themes and ideas generated through these methods would be sufficient to develop relevant and applicable questions for the questionnaire.

<u>Nominal groups</u>

One nominal group was undertaken within the same building as the focus groups. The same email recruitment system was used as above for the focus groups. Originally fifteen participants responded but due to unforeseen circumstances, the group that undertook the discussion was a group of thirteen.

Nominal Group Technique (Lloyd-Jones, Fowell & Bligh 1999) was employed by the researcher and therefore it was decided on the day that the group was randomly allocated into two separate groups of six and seven. After a short introduction of the project, each participant was given two identical sheets of paper all containing demographics and a question at the heading of each sheet. They were asked what they understood by the term Peer Assisted Learning, what their experiences of Peer Assisted Learning were within their time at Medical School and how they would improve or develop it within the current curriculum. A set period of twenty minutes was assigned for this 'silent phase' where they were encouraged to write as prolifically as they could without any discussion between colleagues on their own sheets of paper in silence (Lloyd-Jones, Fowell & Bligh 1999).

Three baseline questions, identical to those asked first in the focus groups, were asked within this stage with each question on a separate sheet of paper. These questions were:

1. What do you understand by term Peer Assisted Learning?
2. What are your experiences of Peer Assisted Learning?
3. How would you improve Peer Assisted Learning within the current curriculum?

The candidates were then split randomly into two subgroups and instructed to elect a scribe and a chairperson for each group. Subsequently, in order of the questions, for this next

'round-robin' phase each participant in turn volunteered an answer they had written and it was written without discussion on the whiteboard. This continued until there were no more answers for that particular question. All items are then clarified by all participants to clear up any confusion before they elected whether any items should be paired as similar topics or kept as singular. Following their discussion the candidates were asked to prioritise the items in order of importance leading from the utmost to the least and come together with one list that they were all happy to represent. This was done using a voting process and the majority took the vote. When both groups had compiled separate lists the subgroups were merged in order to combine their responses into one cohesive list. In this instance the researcher acted as chairperson and scribe. Collaboratively, the latter part of the process was repeated and one list was assembled that represented the views of both groups. Each group was given the chance to explain their points and voting took place again but as one group. At this point, discarding of items was now allowed to create a more concise prioritised list.

Fig 8. Diagram illustrating Nominal Group Technique (Lloyd-Jones, Fowell & Bligh 1999)
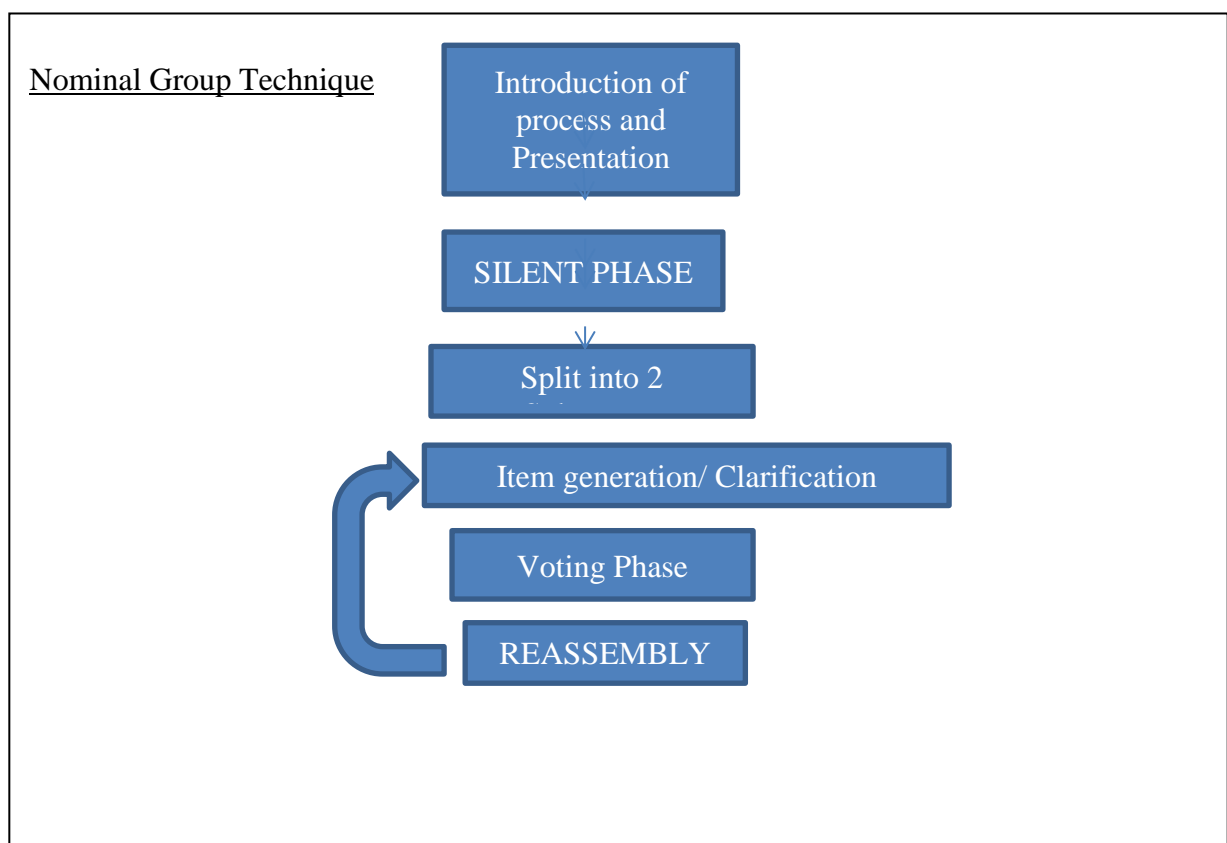
Questionnaire development and validation

The questionnaire was developed using an online tool called SurveyMonkey, the generic format was used to generate the questionnaire. SurveyMonkey is a web-based survey development company founded and owned by Ryan Finley in 1999 with David Goldberg replacing him as the current CEO in 2009. It is currently the world's largest online survey company, helping customers to collect over 2 million online responses a day (CrunchBase 2014). SurveyMonkey provide a free service allowing their customers to design their own questionnaires, collect data and provision of analytical tools. In 2013, SurveyMonkey had 1.5 million users.

Placing the questionnaire online was the agreed course of action largely for easy accessibility for the students. It was thought that the uptake of completed questionnaire would be significantly higher than through only paper distribution. The integral purpose of using mixed methodology was to use the data we collected in the focus/nominal groups to create the basis of the questionnaire.

The author felt that the cohort involved in deducing the categories of questions for the questionnaire would deliver an effective critical appraisal of the questionnaire before it was released to the undergraduate unit. Therefore, an email with the proposed questionnaire was sent to all participants of the focus and nominal groups as well as a current PhD student mentor (Director of Assessment) and the Professor of Medical Education, Professor Helen O'Sullivan, for external validation. They were asked to comment on four key areas: whether the questions were of the right topic, the clarity of the questions, level of simplicity of the execution of questionnaire layout, to suggest any possible methods of optimum distribution

of the questionnaire in order to maximise response rate as well as any other surplus comments they were inclined to have. The initial questionnaire was distributed as a Word document as opposed to the online version that would later distributed to the remainder of the medical school population. It was more efficient to validate the content of the questionnaire, with an approximated layout, rather than to develop the online questionnaire before modifications were made. The approximated layout of a SurveyMonkey questionnaire was investigated prior to validation and the Word document was developed accurately according to the online layout.

The quotes used below are taken directly from email responses received students in the validation process.

1. Are we asking the right questions?

The majority of students commented that the questions were based on the topics discussed in all sessions and each question had clearly stated each objective.

'The questions are really well focused and clearly based on what we highlighted in the session'

'I definitely think you're asking the right questions! It covers the whole curriculum of the medical school.'

2. Do you understand what we want out of the questionnaire - is it clear?

The validators understood the majority of the questionnaire however there were a few areas that they felt were unclear.

Distinguishing the difference between the previous student society mentoring system and the current University affiliated mentoring system (piloted in September 2013) was difficult as those that were perhaps not so aware, because of its recent addition to the curriculum, were perplexed by the terminology of official university guidelines. The previous system does still exist, although in light of the new system it had been rebranded as a 'Buddy' system as opposed to a 'mentor' system. This seemed to be confusing, particularly for those in the older cohort as one student questioned whether the questionnaire had included the opportunity to be a mentor with the Liverpool Medical Student Society even though it had been included as the 'Buddy' system.

'I think the sections about being a Y2 buddy is confusing, especially when it is used under the headings of Y3-Y5.Also, in Y2 we had the opportunity to be a mentor with the LMSS, I'm not sure if that's included'

'...what do you mean by Being 'Y2' Buddy - LMSS mentor and having 'Y2' Buddy – LMSS mentor? Do you mean being a mentee and having a mentor?'

Another area of confusion was the use of acronym 'PAL' when talking about Peer Assisted Learning. Because of this it was decided to put both the abbreviation, the full version and

give a simple definition in the title of the questionnaire: 'Peer Assisted Learning (PAL)
"Students teaching students'.

'... in the title you write Peer Assisted Learning, maybe in brackets put PAL next to it, just because some people might not realize what you mean by PAL!! Most people will but you'll probably get the odd person asking what PAL is haha!

'...put definition of PAL at the beginning in case people aren't really sure?'

'I think it would be good to include a sentence or two at the start explaining what PAL is'

'We should possibly briefly define Peer Assisted Learning (some lower years may not have come across the concept)'

One of the barriers that was mentioned in the focus groups was that sometimes students would use obscure knowledge to try and test their fellow students whether it be irrelevant to the current topic or was a at a level that was not appropriate i.e. Year 1 student learning specialty training knowledge. The original phrasing was clumsy and included the phrase 'being clever for clever sake'. It was decided to replace this with 'Showing off' and then write a small sentence to explain – using obscure depth of knowledge in order to look the best.

'I don't understand what 'people being clever for being clevers sake' means – not bad just need rephrasing'

'I personally didn't understand the 'some people being clever for being clever sake' as one of the down falls.'

The rest of the students seemed to be very happy with the clarity of the questions.

'It's very clear what you want from the questionnaire and the layout is easy to follow'

'It is clear, and the aim of the questionnaire is obvious.'

3. Is the questionnaire easy to do/clearly set out?

The students were emailed the paper copy of the questionnaire before it was copied onto the Survey Monkey page but they were informed of the decision to translate it once validation was completed. For this reason, it fell to the researchers' mistake that it was not checked who had previous experience with the layout of Survey Monkey. One student commented that the layout was far too small on the Word document originally sent – she admitted that she did not have previous experience with Survey Monkey as the layout would have changed when inputted onto a web layout. Small improvements were made such as spacing within the layout to correct the aesthetics.

'The questionnaire is easy to do if it's by hand but on the computer it isn't as the boxes are too small to put an 'X' into.'

'Maybe space out the questions a little in the formatting since it looks a bit clustered in some places'

Other students said that the layout was simple, easy to follow and agreed that tick boxes were preferable to the respondent than having all open-ended questions that required a lot of typing.

'Yep and the survey monkey idea is brilliant it makes it really quick and easy to complete'

'The layout is very clear and easy to follow. I love the boxes!'

'I think the questionnaire is really good - I like that it's mostly tick boxes and it is set out really clearly! I think that because you need to ask so many questions tick boxes are probably going to be the easiest way to get more people to fill them out. '

'...all looks great'

'*The questionnaire is really good! I thought it wasn't too long or short and inviting, well laid out, clear questions meeting clear objectives.'*

One student reminded the researchers of possible obstacles when translated onto online format which was explored at a later date and rectified so that open questions had no character limit so did not force them to shorten their responses.

'I think online surveys tend to have a character limit on open questions, so if you want an explanation for why they agree/disagree it might be better to have an open text box for each of the five questions within the question'

4. Anything else?

Originally, the training part of the questionnaire was only to gauge what the level of interest would be in implementation of such a programme. After validation it was thought to incorporate the type of training that the students would prefer; this question would prove to be interesting in two ways, not only to get a consensus on how they would like it to be delivered but to see if there was a correlation between that particular question and how they perceived group work/lectures in the rest of the curriculum.

'Generally I think the questionnaire is easy to do. The bit about training is good - I hadn't thought about that, but actually I think for people that were interested it would improve PAL quite a lot. Maybe you could expand this section if you wanted to - what do people think should be included in the training?'

The section about which barriers they classed as important was also expanded to include a qualitative open-ended question to explore the scope of barriers that had been potentially missed.

'An 'other barriers' open question after the listed ones might be good'

It was suggested by one student that the experiences for Peer Assisted Learning in each year be combined into one question as an older year it was difficult to remember the experiences they had had clearly, let alone how important they found them at the time. However, after validation many attempts were made to condense these questions into one and unfortunately there was no clear fashion in which was as straightforward as the aforementioned layout.

The only thing I would say is that I struggled to remember what we had done in the earlier years and which bits were relevant to us or what had changed when but I'm not sure there is a way round that!? I don't know if it's possible or if you need to separate it into individual years for the data analysis - but would you still get the information you needed if you grouped the years together i.e. Instead of splitting them into sections of year 1, year 2, etc would it be possible to just do the questions from an overall experience over all the years to date? (Just so you don't end up with a bunch of half-filled questionnaires when you give them to younger years).

One criticism was the length of the questionnaire which was commented on largely because of the target response rate however it was decided that all questions provided should be kept and none deleted for length purposes. When undertaken on the computer the questionnaire took less than ten minutes to do which fit the brief of what was sent for ethical approval.

'The only drawback of it, which isn't really a criticism, only something that might make getting 1000 people to fill it in harder; is the length, but you probably already know that and it can't be avoided!'

The feedback for this part of validation was very positive.

'It seems pretty good to me!'

'I think it is a good piece of questionnaire as it is clear and easy to understand. The questions asked are appropriate and i think overall it is good and ready to be distributed. Is it possible to ask for the help from the University to distribute it via email?'

'I think the questionnaire is really good!! It's easy to complete and short & precise which is perfect.'

'I think this is a really thorough and well thought out survey.'

'I think the questionnaires really good, seems to cover everything we mentioned and when i was reading it through i couldn't think of anything else to add!'

5. How best do you think we can distribute it so as many people fill it in as possible?

Two students suggested a financial incentive in the form of a raffle as a prize draw; however this was not in line with university policy and also had not been submitted through ethical approval. It was a mistake in hindsight from the researcher's point of view for not having thought of this prior to ethical approval.

'If you are really struggling for replies maybe offer everyone who completes it to be entered into a draw for an amazon voucher or something, not sure what your funds at like? I think maybe getting a mailing list from uni is your best way to distribute it and send it as an email link to all years involved'

'Also, if you want maximum people to answer, make the aims of the study clear from the outset. What's in it for the students filling it out? Maybe outline the fact that their feedback may have an impact on how things are ran at Liverpool and is an opportunity for them to

voice their concerns (I don't know if this is the case though), and you'll see suddenly everyone filling it out. I've seen a few studies do things like raffles for participants.'

'...make it easy for people to do online then through email. Maybe you could get UCCT and PBL tutors to hand it out to their groups too?'

Even though many of the comments below stated that email was not perhaps the most popular option as students were inundated with emails from faculty every day it was still decided to use email as the first and foremost form of distribution. During the length of the study, it became clear that after one week students became sensitised to one form of memory aid to fill in the questionnaire and it was quickly noticed that new ways would have to be used fairly frequently. For this reason, CCT and PBL groups were targeted; paper copies distributed at hospital, hospital administrators and the use of text messaging service was also used. The latter approach provoked an increase in responses and has been taken on since by the medical school for student reminders that are important. Many of the above actions were first suggested by the students in the validation pool.

'In terms of distribution maybe catch year groups at the end of lecture, even though I know not that many year groups have lectures together. There is always email, but not that many people read/ respond to emails. Maybe if you could send it to the organizers of the hospital placements e.g. Mrs X at aintree? If they could print them and distribute them before teaching?'

'Maybe think about distributing it with the packs people pick up from the office or something? Not sure many people will look at it if it is just sent out in an email coz most people get email overload and ignore most of them.'

'to get it out to everybody I'd try asking hospitals/clinical skills to give it out in teaching session then spamming peoples emails if you don't get enough back from that'

'As for trying to get lots of people to fill them in how about giving them to PBL groups ? I suppose 1st and 2nd year are easiest to get that way because most of them are at cedar house! Do the convenors get a pack at the start if every module (the big brown envelopes they pick up from downstairs with the objectives and stuff, perhaps you could put them in there?) 3rd year might be easy to get hold off at therapeutics/disability lectures! 4th year with hospital sign in sheets/PBL in hosp/ CCT again in cedar house. 5th year probably the hardest but again at CCT in cedar house and Prof Jha is visiting all 5th year base hospitals for feedback over the next month so most people will be at those.'

Validation from the Professor of Medical Education and Director of Assessment revealed some small grammatical errors in specific questions. These questions were changed so that they would be clearer for the reader. The layout was largely complimented. One of the above pointed out that the abbreviations within the questionnaire were inconsistent and these were changed.

'...it looks very professional, easy to follow and clear. I have a couple of minor points: you seem to be switching from using the acronym (PAL) and the full expanded version in a couple of the questions (i.e. PAL used Q12, 14 and 17 and peer assisted learning used elsewhere in

the questions). All of your scales seem to have first letter capitalised except question 13 'less important' which is in lower case. Otherwise it looks very good.'

'...it looks really great. In Q17 I think it should be "do" instead of "for" on word 9 Also in Q22, if it is possible to add a box for them to list "any other social media that they use" that would be good but I don't think that is essential. There might just be something out there that we don't know about!'

<u>Why use Questionnaires?</u>

In order to get quantitative data on the views and opinions of the study population, questionnaires were made available to all medical students with the exception of first years. First years were excluded because it was felt that they had not experienced enough of the medical school curricula or had much experience of Peer Assisted Learning as a medical student to comment. Partly to reduce any influence of the researcher and partly for wider accessibility to the student, the questionnaire was accessible through an online link as opposed to just being available in a paper form. 'Although there is no interviewer bias in questionnaires it is always possible that the respondent may see some bias behind the content or who sent the questionnaire (Oppenheim 1996)'

The questionnaire (See Appendix) begins with broad demographics to ascertain some trends between responses and hierarchical answers during analyses before using a general question 'How did you find your experiences of Peer assisted Learning in each year?' using a 5-point Likert scale oscillating from "very useful" to "did not have this experience". This question was duplicated for every year from 1st to 5th. Each participant was only required to answer the years that were applicable to them personally – not to comment on a year that they had not yet experienced.

It was decided to use Likert scales to enable the results collected to be submitted for statistical analysis (Likert 1932). The types of testing will be discussed in Chapter 5. The percentages would allow an immediate indication of the initial results of each question before further analysis was performed. The 5 point scale could have encouraged students to select the middle option however it was felt that this was necessary. Some questions utilised only a 4 point scale where it was felt a clear cut opinion was required.

Questionnaire distribution

The questionnaire was applicable only to students in the current undergraduate medical school curriculum at Liverpool Medical School from second year up to final year – including current/past intercalating students who were studying in/outside of Liverpool. The total cohort of potential respondents was 1333 students.

Table 1. Breakdown of medical school cohort in 2013-14

Year	No. students 2013-2014
2nd	296
3rd	313
4th	366
Intercalating (currently)	83
5th	275
Total no.	*1333*

As the accessibility of the questionnaire was easiest for the study population online, the link was first sent in an email (attached to a covering letter – see Appendix) to the student body president who would distribute a weekly email to all undergraduate students of the medical school. Five more weekly emails were sent out over the period of six weeks that the questionnaire was 'live' for. Concurrently, eight individual year representatives were contacted in an identical fashion with the same email and covering letter to notify their years in their weekly emails of the questionnaire. The year reps repeated this email four times over the course of six weeks. It was suggested that the superior way of alerting students to the questionnaire was through the medium of email before paper copies were introduced. The use of social media such as FaceBook also saw a rise in responses and there were a number of 'shares' that encouraged participants from all years to partake. An innovative trial of using text-messaging service was used twice where personalised texts were sent to all second-final year students excluding current intercalating students in which they were invited to respond

through that message that contained the direct link. The popularity of this method will be discussed further in the later chapters.

An email was sent to all educational leads in the following hospitals of that take Liverpool undergraduates: Aintree University Hospital, Countess of Chester Hospital, Royal Liverpool University Hospital, Southport and Ormskirk Hospital, St Helens and Knowsley NHS Trust Whiston Hospital, Blackpool Victoria Hospital and AlderHey Children's Hospital. The educational leads at the above hospitals were known to either the researcher, VT from previous placements or were known to the supervisor of this thesis, SW through the medical school. Student representatives at Arrowe Park Hospital and Warrington & Halton Hospital were contacted about the questionnaire separately to ensure that all students were contacted through clinical placements to make certain maximal student exposure to the questionnaire.

The aim of this was for the hospitals to issue an email reminder and perhaps catch those who are on placement and may find it easier to do there. Finally, paper copies of the questionnaires (which all included a covering letter) were taken to Royal Liverpool University Hospital and University Hospital Aintree and left with the educational supervisors. These two hospitals were chosen because of the biggest cohorts of 2nd-5th years placed there and were felt to be most beneficial to this research.

In the penultimate weeks of data collection lectures of second and third years were attended as a reminder to students to complete the questionnaire and paper reproductions of the questionnaires were left on each seat of the lecture theatre. Copies of the questionnaires were also left within all fourth and fifth year University Clinical Community Teaching (UCCT) sessions. Pressure bias was not applicable as all paper copies were left at the beginning of the

session and told to leave within the rooms so the researcher could anonymously collect these at the end without the respondents feeling pressure to complete the questionnaire in front of the researcher.

Sixty-three copies of the questionnaire were collected in paper format and inputted by VT through manual entry into the online database.

Qualitative Data Analysis

Qualitative data analysis has become increasingly useful in medical education research within the last 25 years, since Ritchie and Spencer first developed the Framework Approach Analysis in the late 1980s (Huberman & Miles 2002). There are many different types of qualitative data analysis that could have been applied to this research. Smith and Firth (2011) classify these analyses into three broad categories (Smith & Firth 2011):

a) Sociolinguistic methods – Conversation analysis that explores the use and meaning of language.

b) Theoretical development methods – An entirely iterative approach where results develop constantly in response to the data in an ongoing analysis.

c) Content and thematic analysis methods – A descriptive interpretation of participant views in a methodical manner.

The two methods discussed here will be Grounded Theory and Framework Analysis.

An inductive method of qualitative analysis frequently used is 'Grounded Theory' borne out of research by sociologists Glaser and Strauss (1967) where the aim was to develop social theories methodically through data analysis. Grounded Theory was to take a concept from the data and apply it as a methodology in order to form relationships between the data (Glaser 1967). Once an accepted idea was noticed it would help to understand the world of sociology in a 'new way' before being subject to testing. The differentiating factor of Ground Theory is the weight on new theory development as the final outcome. It is an approach that works through constant comparative techniques where the stages are collective rather than linear. Many of the stages of Grounded Theory and Framework Analysis are fairly similar.

- Open coding – initial familiarisation with the data

- Delineation of emergent concepts

- Conceptual coding – using emergent concepts

- Refinement of conceptual coding schemes

- Clustering of concepts to form analytical categories

- Searching for core categories

- Core categories lead to identification of core theory

- Testing of emerging theory by reference to other research and to social/cultural/economic factors that affect the area of study (Lacey & Luff 2007)

Strauss and Corbin (1998) said that it required 'theoretical sensitivity' where it uses 'an ability to see the research situation and its associated data in new ways and explore the data potential for developing new theory' (Strauss & Corbin 1998). They used an original, creative approach to develop new research theories using a scientific basis to underpin ideas.

Conversely, Framework analysis originated from large scale policy health research and so is designed to 'meet specific needs, provide outcomes or recommendations all within a short space of time' (Lacey & Luff 2007).In this way it is more suitable for research described within this thesis than Grounded Theory. The delineating feature of Framework analysis is the 'matrix output : rows (cases), columns (codes) and 'cells' of summarised data, providing a structure into which the researcher can systematically reduce the data, in order to analyse it by case and by code (Ruhl 2004). It has become progressively more fashionable within health service research in the last decade. The terms qualitative analysis and thematic analysis are often used interchangeably when referring to Framework Analysis. Unlike Grounded Theory, there are six key stages to Framework Analysis and these take place in a linear fashion (Gale et al. 2013; Lacey & Luff 2007; Pope, Ziebland & Mays 2000).

1. Transcription

Ideally a *verbatim* word for word transcription should be used. An advantage of researchers compiling their own transcriptions of data is to immerse themselves in data so they begin the process of familiarisation.

2. Familiarisation

Reading of the transcript in its entirety and studying of notes in order to list any immediately obvious or recurrent themes. Notes may be made during transcription and the two steps listed above can often be interchangeable.

3. Coding/identifying a thematic framework

At this stage the 'initial coding framework' is developed. The transcript is read line by line and a label is applied when a passage is deciphered as important. The key themes, concepts and ideas are all identified by which the rest of the data can be examined. This is dissimilar to 'open coding' where codes are applied to everything that is deemed to be important from any perspective not just in relation to the original research question. Prior issues are drawn on and any emerging themes that come from the familiarisation stage – especially those issues raised by the participants in the cohort. This original framework will be honed in the subsequent stages. The outcome of this stage is a thorough index of data which has pinpointed the pieces of data for future identification and retrieval. If feasible, multiple researchers should independently code a transcript before comparing results and evaluating.

4. Indexing/coding

The application of the thematic framework to the data methodically by marking the original transcript with a system to signify which areas of the transcript correlate to which 'indexes' distinguished in the above stage. Numerical codes are usually used to label specific pieces of data in correspondence to the different themes. This can also be done in textual form but whether numerical or textual, they are both usually accompanied by short descriptive 'chunks' of text to remind the researcher of the context and elaborate on the short hand of the index.

5. Charting

This stage is largely a 'sorting' exercise. The data is reorganised into a visual aid according to eh appropriate part of the thematic framework so that whole data set can be read easily 'at a glance'. There is likely to be a separate chart for each key theme where the data is condensed into summaries of the experiences and interpretations as opposed to factual quotes from the data. Charting can be done by theme or by case depending on which is more appropriate to the data set.

6. Mapping and interpretation

Successively, the charts formed in the above stage are used to explore the data for any trends, associations, concepts, variations in opinions and any explanation for these findings. Ritchie and Spencer (1994) propose that at this stage the analyst may be 'aiming to define concepts, map the range and nature of phenomena, create typologies, find associations within the data, provide explanations or develop strategies' (Huberman & Miles 2002). They allude to the fact that the centre of the analysis will be contingent according to the themes that have emerged from the original research question and may not be where the analyst had typically expected to focus. The analyst must remember the influence of the original objective during their interpretation. Miles & Huberman (1994) also recommend a wide range of ways to display data in order to make it easier to identify themes (Miles & Huberman 1994). The intention of these techniques is to present the data in such a visual way to aid the researchers' interpretations to be wide and open.

The Framework analysis is particularly applicable for thematic analysis of textual data i.e. interviews, focus groups as it enables different aspects of the phenomena under investigation to be captured (Ruhl 2004). The interconnected stages explicitly describe the processes and act as a guide to the systematic analysis of data from initial stages to the end which can be followed even by researcher new to qualitative analysis.

A critique of thematic analysis is that it lacks depth (Attride-Stirling 2001) as sections of data can become fragmented from the original resulting in misinterpretation and consequently the outcome can be subjective and lacking in transparency particularly in the development of themes. It is also not suitable for heterogeneous data, without similar key themes the data becomes impossible to categorise.

Following transcription and application of the Framework Approach by VT, the full transcription was read through by a supervisor, Dr Simon Watmough (SW) as a form of validation. The codes and themes applied by VT were also read through and validated by Dr Watmough.

This was to ensure that there were no absent themes and the Framework Approach had been applied correctly.

<u>Statistical Analysis</u>

Medical research has become increasingly reliant on using the concepts of statistical analysis to validate their studies within the last 50 years. Ronald Fisher was the first to introduce the idea of significance testing and inferences in early 1920s (Finney 1964). He measured the strength of evidence against the null hypothesis and used a 'P-value' as the index i.e. a null hypothesis when testing effectiveness of drugs would be that the drug does not affect survival rates. Having concluded that 'If P is between 0.1 to 0.9 there is certainly no reason to suspect the hypothesis tested. We shall not often be led astray if we draw a conventional line at 0.05' Fisher advocated that a value less than 0.05 would strongly indicate that there is evidence against the original hypothesis. Since, then it has been argued that within medical research and education, 0.05 leaves a margin that is too wide to be considered effective and some have argued that the figure of statistical significance should be lowered to 0.01 (Sterne & Davey Smith 2001) .

T-tests are a type of statistical 'parametric' test, which assume that the underlying distribution of the variable of interest is normally distributed (Fagerland 2012). It was originally established by WS Gosset in 1908 (Raju 2005).

Relating to the research in this thesis, t-tests have been used to compare the results dependent on the year they are currently in. For example, the use of 'PAL experiences in Year 3' as the dependent variable and comparing 3rd years with 4th years as the independent variables. If the result were to be statistically significant, for example, the differences in PAL experiences in Year 3 would have occurred because of the year the students were in.

The data was modified for statistical testing. Numerical values were assigned to each possible response on the 'Likert scale' for each question and a mean for each question was calculated. The means were used for each t-test to compare the possible significant differences between the years in order to find any association or statistically significant differences between the years that were compared i.e. 2nd year vs 3rd years. For example, for question 2 'How did you find PAL experiences in Year 3?', part 1 'Being a University mentee' each Likert response was given a number. In this instance 'very useful' was 5 and 'did not experience' was 1 and a mean was calculated from all the responses given by students who were in 2nd year. Using the previous example, all responses were given numerical figures and a mean was calculated for 3rd year students (at the time of the study). These two 'means' were used to calculate the t-tests and gave the data represented in Table 29 onwards; if applicable a statistically significant different was calculated.

<u>Triangulation</u>

Triangulation is an important part of a research project to ensure thoroughness. For this reason, a mixed methodology technique has been used in this project to achieve the necessary level of corroboration of all results. Emergent themes or new developments are likely to arise from the analysis of integrated methodologies, and can often facilitate each process as data from each method can lead the way in the next. The justification/rationale of using qualitative method is that it can often explain the statistics and what is behind the quantitative research. Quantitative methods can also give the direct effects of research in a quantifiable way that is more easily assessed. The integration of the three qualitative research methodologies was an advantage in terms of triangulation – even though it was predicted that there may be similar themes.

The principle of triangulation within qualitative research is to increase the validity and credibility of the results. There have been many definitions of triangulation used. The definitions below are in chronological order of publication:

- Cohen and Manion (2000) – " attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint" (Cowman 1993)
- O'Donoghue and Punch (2003) – "method of cross-checking data from multiple sources to search for regularities in the research data" (McCarthy & Crandal 2011)
- Altrichter et al (2008) – " it gives a more detailed and balanced picture of the situation" (Altrichter & Feldman 2008)

In 1978, Denzin also identified 4 basic types of triangulation (Denzin 2006):

1. Data triangulation - involves time, space and persons

2. Investigator triangulation – uses multiple researchers in one project

3. Theory triangulation – usage of multiple theoretical schemes during interpretation

4. Methodological triangulation – involves using multiple methods to gather data i.e. interviews, observational groups, documents, questionnaires.

For the purpose of this thesis the type of triangulation used is methodological triangulation. Many of the themes from the focus and nominal groups coincided similarly with the themes that emerged from the questionnaire results. Originally, the focus and nominal groups were organised to see what students felt about PAL, and to provide topics for the questionnaire. They also provided good information in their own right but the results from them can be used to verify the questionnaire results. There was a large overlap between the qualitative comments on the questionnaire and the results of the focus and nominal groups. The thematic similarities and development of themes from focus/nominal groups to the questionnaire will be covered more in depth within the chapter on "Results".

Summary

In summary, this chapter has shown the justification of using the research methods – focus groups, nominal groups and questionnaire on the study population. The rest of this thesis will focus on the results and analysis of this compilation of data.

Fig 9.
Stages of Qualitative Data
Analysis

```
                          ┌─────────────────┐
                          │      Start      │
                          └─────────────────┘
                                  │
                                  ▼
                 ┌──────────────────────────────────┐
                 │ Ethical approval application and  │
                 │ short literature review performed.│
                 └──────────────────────────────────┘
                                  │
                                  ▼
                 ┌──────────────────────────────────┐
                 │ Questions designed according to   │
                 │ literature review and current     │
                 │ curriculum reform.                │
                 └──────────────────────────────────┘
                                  │
                                  ▼
            ┌─────────────────────────────┐    ┌──────────────────┐
            │ Focus/nominal groups        │◄───│ Notes made in    │
            │ recruited                   │    │ each session by VT│
            └─────────────────────────────┘    └──────────────────┘
                                  │
                                  ▼
                 ┌──────────────────────────────────┐
                 │ Focus groups supervised and voice │
                 │ recorded                          │
                 └──────────────────────────────────┘
                                  │
                                  ▼
                 ┌──────────────────────────────────┐
                 │ Notes made by VT after each focus │
                 │ group giving short overview of    │
                 │ atmosphere and key points         │
                 └──────────────────────────────────┘
                                  │
                                  ▼
┌──────────────────┐   ┌──────────────────┐   ┌──────────────────┐
│ Emails sent to   │──►│ Themes           │◄──│ Notes made       │
│ VT within one    │   │ identified       │   │ alongside        │
│ week of each     │   │ according to the │   │ transcriptions   │
│ group with       │   │ original         │   │ for any common   │
│ contributions    │   │ questions        │   │ themes within    │
│ from             │   └──────────────────┘   │ identified codes │
│ participants     │                          │ from notes taken │
│ included in the  │                          │ at the time      │
│ transcriptions   │                          │ included in the  │
└──────────────────┘                          │ transcriptions   │
                                  │           └──────────────────┘
                                  ▼
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                 │ Tapes transcribed│
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Chapter Four - Results of Focus and Nominal Groups

<u>Focus groups</u>

The results of the focus groups will be discussed in this chapter. Both groups were tape recorded with the participants' consent and provided also with an information sheet and a consent form before the session began.

Table 2. Classification of participant demographics in focus groups 1 and 2

	No. participants	Demographics
Focus Group 1	4	M = 0 F = 4 1 x 4th year 2 x intercalating students 1 x 5th year
Focus Group 2	7	M = 2 F = 5 2 x 5th years 1 x intercalating students 2 x 3rd years 2 x 2nd years

Participation in these groups was voluntary and it was made abundantly clear that non-participation or withdrawal from these groups at any time would not affect their medical studies. Recruitment was via email and highlights the random selection process. Prior to commencement each session an information sheet and consent form were given to each volunteer explaining the rationale of the study. There was then an opportunity for the students to leave if they so wished. There were no students that chose to leave following initial stage. Focus Group 1 suffered from a small drop-out rate on the morning of the activity; two students from 3rd year were unable to attend duo to clashing timetables. However, a good discussion was still generated. The combination of male and female was generally representative of the study population in Focus Group 2 however the entire of Focus Group 1 was female. A wide variance of all years was recruited for both groups. The groups contained

graduate entry students that were on the graduate scheme as well as graduate students that were on the usual 5-year MBChB course. Only the researcher, an intercalated medical student, was present during these sessions and no other person of seniority was in attendance. This was arranged so the participants felt they could speak candidly without impact on their studies. All data was anonymised as no students or their comments were identified and marked during transcription or analysis.

Both groups were partially structured and partially free thought depending on the discussion between the participants. The researcher was able to guide the session using 10 basic questions that were used synonymously in both groups.

1. What do you understand by the term Peer Assisted Learning and how does it work?
2. What are your experiences of Peer Assisted Learning to date?
3. How you would you develop or improve peer assisted Learning in our current curriculum?
4. What are the barriers to Peer Assisted Learning?
5. 'Medical students with better understanding of teaching become better learners'
6. 'Teaching is essential physician-patient interaction, you become a more effective communicator from teaching'
7. 'Medical students interested in teaching will become future educators'
8. 'Exposure to teaching principles should be in a sequential manner from undergraduate level and continue in postgraduate education'
9. How do you feel about social media i.e. FaceBook, Twitter, DropBox in medicine?
10. Any other changes for Peer Assisted Learning or curriculum Review – any other comments you would like to add to the discussion?

Although both focus and nominal groups were voluntary; with all participants attending of their own free will, it is pertinent to understand their reasoning for partaking in such an activity and acknowledging an element of self-selection in this study. A small number of the participants knew the researcher as fellow colleagues or peers within the medical school. Other reasons for involving themselves within the study group could be an interest in medical education, an interest in voicing concerns they have with the curriculum or an interest they have in PAL. For the above reasons, these students who have actively volunteered to partake in this study may not be completely representative of the views of the reminder of the medical school. Both focus and nominal groups were representative of the medical school demographic in terms of gender and ethnicity.

The analysis of the focus groups was outlined and as previously mentioned the Framework Approach (Huberman & Miles 2002) has been used to the analyse the qualitative data. This approach allows the objectives and themes of the research to be ascertained briefly before data collection. The general themes of the approach centred on the attitudes towards Peer Assisted Learning and the conceived merit and value to the students as a technique of learning.

The transcripts generated 14,645 and 23,566 words, respectively. Both transcripts were transcribed word for word by VT. A four hour time slot was allocated for each focus group, half an hour was spent introducing the subsequent exercise and each discussion lasted up to three hours. The transcripts consisted of the discussions only. Both focus groups lasted approximately two and half hours from the moment the tape recorder went on to the moment the tape recorder was stopped. The transcripts were read on multiple occasions for familiarity before application of the framework mentioned in chapter three. Initially, the analysis was based on the pre-determined themes; every time a line was in relation to a 'theme' or

'question' the number of that theme was placed by that line. It was easy to see that there were plenty of emerging themes that did not fit within the original framework. These themes were then categorised into a 'miscellaneous' category and then coded between themselves before applying directly back to the transcripts.

In order for the central themes to be easily identified for analytical purposes and recapitulation in the results it was decided to use the Framework Approach to catalogue the data from the transcripts into small quantities of text. The process promoted indirectly by Ritchie & Spencer (1994) references coding data as "indexing", followed by "mapping", "coding" and splitting data into "manageable chunks" (Huberman & Miles 2002; Watmough 2008). This is explicitly described by Miles & Huberman (1994). As different "codes" became apparent within each initial question they were easily compartmentalised as subsections for all themes – original and emerging (Miles & Huberman 1994). Before conclusion of this stage, all transcripts were read again to ensure that no sections had been omitted and all information was contained either coded or indexed within the framework.

It has been suggested that more focus groups ensure a saturation of themes however a less number is needed in groups where participants have homogenous views (Morgan 1998; Watmough 2008). The aim of this study was not for saturation of themes as it was not a solely qualitative study however saturation of themes was reached between the focus and nominal groups. A saturation of themes was also achieved between the focus and nominal groups and the qualitative responses from the questionnaire. This demonstrates the strength of the results and its validity.

Having completed each focus groups, the notes made during each session by VT were reviewed where the dynamics and interaction of the participants in each group had been

noted. These were kept for reference during the analytical stage. It was important to observe whether the tone of each group was mainly uniform with each other or whether there were many radical opinions. Overall, all groups were remarkably similar with a few extreme views that were taken into account.

For example, one student stated:

'1 day a week for clinical contact in 2^{nd} year is enough – sometimes I think it is too much to start clinical in 2^{nd} year;

In the event that there was an unorthodox view expressed, the overriding view was outlined first. It was necessary to include all opinions from the focus groups to justify the analysis. The supervisors of this thesis checked the transcriptions of all groups in order to verify the codes and analysis.

1. <u>What do you understand by the term Peer Assisted Learning?</u>

The above 'definition' question was used to start all the focus groups before any more specific questions were used and the following section shows examples of replies from this opening question. The majority of both groups expressed similar definitions relating to being taught by people they classed within their social grouping i.e. students and also agreed on other less obvious forms of PAL.

'Teaching, help, advice or sharing resources from students in the same year or other years i.e. if you're on different rotations or having 4[th] years teach 2[nd] years bedside teaching'

One student claimed that PAL was exactly between peers and did not involve university in any way.

'In my opinion, it's more informal, nothing to do with faculty; teaching that is not affiliated with university'

2. <u>What are your experiences of Peer Assisted Learning to date?</u>

Regardless of their year, all students stated that inter-year teaching, whether they had experienced this as a younger year receiving teaching or were able to implement teaching in their hospital experiences as an older year i.e. 4th/5th year, was an invaluable experience. They appreciated this form of learning particularly because of the peer environment.

'Being taught by 4th years when I was 2nd year, older years are generally very helpful especially for ward/bedside teaching. Going through presentation, history, exam, differentials'

'More reassuring to talk to someone who has been through the experience and sometimes goes through in a more logical approach'

'When 5th years do teaching its really good when they relate it back to a scenario you are learning about or pick patients with specific signs you need – really good for OSCE scenarios'

'Sometimes the consultants do an examination on the level of their specialty which may only cater for their side of the specialty and miss out half of the exam that we need to know'

Three students mentioned "mentor schemes" that are currently in place within two different hospital trusts. It was noted that the university had not instructed the hospitals to put these schemes into place and in two cases students had instigated these programmes themselves.

'...we put 2nd years into groups and two 4th years on different rotations did a weekly session once a week. The feedback was that they appreciated it because we understood the level they needed to know and not taking it over their head; what isn't appropriate...'

'There's a mentor scheme in Aintree where the 4th years love teaching to revise the topics and 2nd years love being taught'

'In Whiston, they gave us 4th years and we were paired specifically to contact them for teaching. Now in 5th year we're now paired with F1 and I learn a lot this way'

The teaching perspective was explored positively more from the 4th and the 5th years. The positivity from this aspect of PAL seemed to stem from experiences that they had been involved in from younger years and gave them an incentive to 'pass it on' to the younger years. The students also demonstrated refreshing insight that teaching is a skill expected from them in their future vocation and so early exposure is imperative.

'It makes you go over things you don't know and within PBL group you teach a lot, in UCCT in 4th year we did tutorials that you revise topics for. We wrote MCQ questions for each other too. If you can teach somebody a topic then you know that you know it so it's really beneficial and develops skills we will need when we qualify'

'You don't want to look silly and give your students a short deal – confident advice is reassuring'

Many of the students have experienced many positive PAL occurrences with their 'mentors' appointed by the Liverpool Medical Student Society and other have also gathered other 'mentors' due to their extracurricular activities.

'Had some people in year above organise a practise OSCE at their house – setting up stations in different rooms and to give idea of possible station format to take pressure off the formative? Gives you a helpful run through'

'If you're in a particular sports club or society with older years they will help you'

'Really useful to have mentors in the same base hospital as you – found it good when my 2nd year was in my hospital, a lot easier'

They did acknowledge though that depending on mentors had turned out to be slightly unreliable for some people.

'If you have a mentor that is willing to help you then that's good but if they're lazy or they can't bothered then where does that leave you?'

LOCAS is a practical examination in the final exams of 4th year medical students in Liverpool. There is no mock examination and the first time that the students perform the exam is in the summative exams in the summer. The exam consists of 2 days of practical examinations and histories in the presence of patients with diseases and the students will need to elicit a history, perform an examination and deduce from their findings a diagnosis in eight minutes. This is followed by four minutes of questions on that particular topic from the

examiner. The examiner is usually a consultant that is not specialised in that field to avoid them asking questions that are exceedingly specialised for 'finals' level. The younger years were understandably quieter on this subject as they had not experienced this yet however the older years, specifically those that had completed final exams, were quite frank and emphasised that without Peer Assisted Learning, they perhaps would not have felt so comfortable or done so well in that particular exam.

'Prime example of PAL – 5th year preparation for the 4th years was very good'

'I only practised LOCAS using PAL as it was the only way we got any information about the exam! It's the way you should practice though, testing yourselves and teaching others. '

'LOCAS days that year reps organised was good. The 5th year speakers were the best speakers because they knew the process – doctors were great but do give a different perspective that comes from working. I feel I would now be in a good position to explain to 4th years about LOCAS.'

In particular, the older students were more forthcoming with the advantages of PAL than the younger years. This may be because they had either been through the curriculum for longer, some had been exposed to other medical school teaching and others were currently intercalating in lecture-based courses with little group interaction. The students all agreed that teamwork was a particular skill that they were keen to develop and acknowledged that use of PAL in that progression.

'Never really see the students from traditional courses that come here for electives working together, discussing anything or helping in a PAL way'

'Here we have more enthusiasm for group learning rather than other traditional curricula'

'The students on my current intercalation don't seem to work well in groups at all; they can't express anything without arguing, go straight to the lectures and seem to find teamwork difficult'

'...does teach you how to be self-directed, organise your time and we've formed our own group to teach ourselves what we need to know – so we've chosen this way of teaching.'

The subject of having a 'hospital partner' was discussed at length with overall consensus that it was a helpful experience to have someone to take histories, practice examinations and critique students at critical points of each consultation, in particular in relation to university exams.

'Seeing patients in 2nd year was really good for relating cases to each other, was always really helpful – watching someone else do it can change your practice for the better'

A disadvantage that was revealed by one student however was that they felt that over-familiarity of our peers may begin to hinder learning when exposed to the same partner for a prolonged amount of time.

'But if you start to get comfortable and they're strong in areas that you are weak in you might end up just relying on them to do "that bit" that you always forget. Some partners have different styles and it can hinder you to stay with same person because you'll stop improving maybe?'

3. <u>How you would you develop or improve Peer Assisted Learning in the current curriculum?</u>

The students generated a prolific discussion as to methods of implementing PAL into the current curriculum with numerous suggestions.

Many students proposed that the direction of the first year curriculum should be altered slightly to include more opportunities for PAL – not just to expose them to the culture of PAL earlier but to also give the older years multiple possibilities for them to teach and as an additional advantage to keep their knowledge up to date.

'I would change how this course is advertised in the prospectus i.e. we give support but you are expected to be motivated to learn and teach others, explicitly foster the attitude of teaching'

'If someone were to guide you through the scenarios subtly so you knew a bit of how teaching was meant to take place you would experience PAL earlier'

'It's a problem with having nothing to do in 1st year to a lot in 2nd year – maybe 2/3 days of lectures or teaching a week and having 2nd years take a specific allocated time to teach 1st years. Reinforce as part of the course. This would improve 1st year and reinforce in 2nd year also. Don't think there is much wrong with 2nd-5th year really because I love the early clinical experience.'

There was a unanimous opinion generally from all years, that 5th year students should be involved in younger year teaching as much as possible, there are far less unyielding potential timetable constrictions than 4th year and should be encouraged with allocated time in the curriculum.

'5th years should do 1st year PBL – more trying to get them to know where they initiate their learning, not just standing and talking at them. It's a skill they need to get to grips with.'

'Have some dedicated time as part of the 5th year portfolio for each rotation – say 5 teaching sessions a year? I agree that 5th years should do 1st year PBL as this assists PAL but maybe not 4th year as this intensity might be a stressor. 5th years relate well to clinical side.'

'Teaching in 5th years. Maybe morning to teach and afternoon to take a PBL session.'

However, the current 5th years did agree that in the current system even though they are keen to teach and take sessions, the ward-time that they are missing has thwarted their attempts and they have been discouraged to continue teaching as they cannot commit to a full set of sessions despite their best intentions.

'Currently I find it hard to take time off without missing work but it is the way it is timetabled for clashes it isn't that we don't have enough time. I don't want to miss ward time but I do want to teach – maybe using two 5th year students per group would take the pressure off'

There were conflicting views on university involvement to affiliate all PAL as a formal exercise but the majority agreed that the university should work together with the hospital

trusts to standardise the PAL opportunities. Currently, the opportunities are quite

disproportionate between hospitals, reflecting unequal PAL experiences for medical students

on clinical placement and a need for standardisation.

'Need some guidelines for how PAL is useful so if you can say from this study this is what

and why students find this helpful, then hospitals could do something with it, doesn't need to

be rules just guidance'

'Formal incentive system that the university was affiliated with which means that you take

part in a scheme to teach younger years'

'Make it a mandatory sign off thing'

'It would make it a level playing field if it was formalised. Those that don't have access to

other medical students through extra-curricular need something to rely on. Try and integrate

it into course and hospital for a better outcome'

'It's not yet formal so some hospitals have a lot of PAL, some don't have any and it wasn't

pushed so as a 4th year last year I would have benefited hugely from it. I wanted to go over

topics, keep it simple and get to know a topic inside out. We need some guidance on how to

teach though. If there was a way to get a programme for teaching incorporated in the

curriculum in the logbook?'

The majority of students apart from the current intercalating students were keen to discuss the

University Mentoring System that had been implemented in September 2013. Previous to that

there had been a mentoring system put in place by the Liverpool Medical Students Society, however, the university was not in control of that system. The majority of the students were confused about the sudden implementation and were not aware of the actual remit of the system, in particular, what kind of support was expected from them as mentors. The students were varied in their opinions in how best to foster a more encouraging attitude towards the new mentoring scheme as it is at the moment a compulsory programme. Half the students preferred an 'opt-in' programme as opposed to an opt-out scheme.

'Should be an opt-in system'

'Recurring theme of if you opt in they you're keen to teach and more likely to make contact, follow through and arrange teaching'

Some students were worried about the difficulties of this compulsory system and how it is monitored as there had either been no communication from mentor or mentee and they were not aware of a penalty system or alternative advice that could be sought. The students were concerned about receiving the same experience as everyone else.

'Is there a system, of approaching the university and saying my mentor isn't helping can I have somebody else? Does that exist?'

The older years were able to look more at the timetabling similarities between years and comment on the solution to differing timetables by including intercalating students and keeping the parallel topics such as general medicine, which occurs in both 4th and 2nd year, together.

'Involve the intercalating students as mentors – we currently know nothing about this new system. It benefits both parties; we tend to have some more time and are the type of people that want to teach'

'Definitely keep 4th and 2nd years together as mentoring because of same topics i.e. general medicine and surgery are the same in both years. Helps the 4th years revise and 5th years can help, having done finals. Use 4th years for 3rd years if they have time'

'Use the template of mentoring that they use in the hospitals, it makes sense when people are in the same place'

'I think you should start to teach as soon as you start to mentor i.e. 2nd year'

All participants were in favour of implementing a form of training programme for teaching as they felt that some people were lacking in confidence to teach others not necessarily that they did not want to participate in the culture of teaching. The reciprocal benefit of PAL would become more apparent once they had a grounding of training and were assured that the delivery of information was sufficient and engaging for their audience. The vicious cycle of low confidence leading to poor delivery to meagre feedback and subsequently reluctance to teach would only be broken by inspiring confidence as a basic level. The advantages of such a syllabus were rapidly identified. As mentioned in chapter 2, studies have proven the benefits of inspiring confidence using training programmes (Lockspeiser et al. 2008; Soriano et al. 2010). Theories of cognitive and social congruence support the idea of using PAL to

build confidence in students by providing a positive environment in which to develop confidence in teaching (Ten Cate & Durning 2007a).

'Proper training for medical students who specialise in Medical Education would be good, maybe some sessions on how to teach properly, a structure and how to deliver effective session. Will be standardised'

'You will have to teach as F1 because it is part of GMC Guideline so we should start learning how to now'

'Make it clear it is important for the teacher – positive reciprocal benefit'

'The system would guarantee improvement rather than just staying on one level'

'People lacking confidence will grow'

Three students who had previous experience in delivering lectures were keen to emphasise the advantageous skills they had gained. They conceded that a course in deliverance to large groups of students may have alleviated their fears prior to doing the lectures.

'Senior students doing lectures, people do it in hospital already so should take advantage of fantastic learning opportunity'

'Lecture technique course of 4th/5th years'

Conversely, although it was agreed that a training programme would be beneficial the students were unable to agree whether it should be a mandatory part of the course.

'Compulsory training – means people have to do it and can't shy away because they think they're rubbish and get opportunity to develop some skills. But if people only doing it for logbook is the intention as real?'

'Opt in system to start with as they will be genuinely interested and spread by word of mouth'

'People who are interested will attend and get better; the less interested will do it once so often and create a bigger gap of difference'

'Compulsory first and then tailor the system from the opinions of attendees and ask them to vote compulsory or opt-in'

It was difficult however, to think of ways that this level of teaching if it were to be formalised, how it would be monitored so that everyone was delivering same standard. With an educational programme as above, an assessment was not thought to be necessary as this might deter students from taking the course if it was an 'opt-in' system. The current 'logbook' system could be extrapolated to include this or using the 'academic advisor' role that is in place in combination with this 'teaching' strand. The logbook system is currently used for students in years 1-4 where they are given a paper portfolio detailing which categories of histories, examinations and practical procedure they are expected to complete each year. Each activity must be completed to a satisfactory level signed by a clinician to verify their competency in said activity. The logbook can be used as a form of assessment,

formative and summative, and most commonly is used as an ongoing record of progress throughout the year by academic supervisors.

'If it is in the logbook you would have to perform to certain standard and education supervisor could be in charge? Better use of academic advisors so we can ask for advice on teaching/monitor how you are doing. They would be judging it on your feedback so you could discuss different difficult scenarios or ask for help'

'A cycle of feedback – review each session they advisors review your feedback'

A topic that was widely discussed within this section was curriculum development. It was particularly interesting to observe the dynamics between older years and the current 2nd years when talking about potential alternate 2nd/3rd year curriculum – especially the issue of how much clinical time they are expected to have before 4th year. Some 2nd year students felt that there was too much clinical time possibly because the step up between 1st and 2nd year can at first seem overwhelming although those in the older years are able to put the 2nd year schedule they previously experienced in context with the rest of the curriculum. Other 2nd years possibly felt that there was not enough clinical exposure for them to take in everything they felt they should be learning.

'1 day a week in 2nd year is enough'

'I like 2 days a week – it's manageable'

'Better for students if 3rd to 4th year was a smaller step up'

'Like the idea of hospital 5 days a week earlier in the curriculum – will be lots of small group PAL teaching'

'Modular throughout 1st-3rd year might mean that you learn better throughout the years before recapping it for 4th year'

'How about a concentrated rotation and then an exam at the end? Exams throughout the year might not be a bad thing to help you to work throughout the year.'

One student used her previous experience of a rotation in hospital in 2nd year to suggest that this approach may work across all trusts.

'Would be good to have teaching in the morning and examinations in the afternoon – hospital dependent?'

All students agreed that less clinical time may hinder learning as although it is a steep learning curve when learning 'on the job' so to speak that is the most crucial time of maximal information absorbance.

'Less time in hospital will slow down learning because that's where you pick up most PAL things quickest'

One student mentioned that although he agreed with the above he wondered if in the long-term it was actually detrimental with not enough time spent on the basics before diving into clinical work.

'You learn a lot but maybe do you learn too fast? Getting ahead of yourself doesn't work if you don't have a foundation because your focus has changed to all clinical'

'1st year should have case based discussions to develop foundations and carry on in 2nd year with early clinical'

The students felt that the current MBChB programme contains many opportunities that could be extrapolated to develop beneficial university affiliated resources. Using Clinical Skills Department within the 4th year to give a mock format of the LOCAS examination process for example as well as utilising the aptitude of the UCCT tutors in creating a question bank from the MCQs made by the students. The ideas for PAL here already exist, however if the curriculum were to be more formally constructed explicitly to include PAL, opportunities such as those listed above could be maximised.

'Would be good to have an opportunity to practise LOCAS as a mock. Just to set up the format in Clinical Skills as we do for OSCE. We don't need real patients just for the timing of the exam and the type of questions'

'Have a student led question bank as we generate them for 4th year UCCT every year'

'Good group study space in hospitals- encourages impromptu PAL on placement'

This however, would need monitoring and some students questioned how this would work

and whether it would be met by resistance.

'Introduce a filtering system for the questions. People will have a focus would the academics and professors be interested in that?'

'If we put it in the timetable in time it will become part of the system'

There was a large emphasis on the reciprocal benefit of learning to teach the subject as well

as gaining knowledge and it was unanimously acknowledged that although it would

idyllically work that every student became an effective, eager teacher it may not be

practically possible as it may not suit every students' learning styles or needs.

'We would prefer to have less people teaching but have them enthusiastic as they will be better teachers'

4. <u>What are the barriers to PAL?</u>

It was a concern that one student mentioned that 'choice' was a barrier. The student explained that had someone not agreed to be part of a programme when the curriculum was introduced to them – this may lead to reluctance to participate and this could be a barrier. Medical students do need to be 'signposted' towards prats of the curriculum like PAL.

'If the older years haven't chosen to do a programme like this one (new mentoring scheme introduced 2013) how can you force them to do something they haven't signed up for?'

A major barrier was problems with knowledge. A few of the students were apprehensive because they had experienced bad teaching from peers in relation to being taught incorrect knowledge. Other problems were learning one topic in-depth and relying on your colleagues to teach with the same amount of a complexity that they felt was comprehensive to their learning.

'If you are teaching then you are relying on someone else's' knowledge, are they right? And is it worth your time if you end up having to check for yourself anyway? There is always that barrier with wondering if the teacher is right – even with F1s/lecturers so why is it different for students? Probably more so'

'If you've only learnt one thing and when you're really busy you will only do that and other haven't put much effort in you're not confident with their knowledge'

'If you're doing a difficult examination that you are not too familiar with you might get to a point where you say I don't know but I think I got taught this… the direction gets lost'

'Senior students can guide us but they tend to like giving the wider picture which is more basic. Is relying on students a good thing?'

A lack of enthusiasm from not only the teaching perspective but from the learning perspective was also highlighted as a weakness of the system. Having a disinterested group of students that refuse to interact with the session was identified as disheartening as having an indifferent teacher.

'Sometimes you organise teaching, book rooms, prepare hand-outs and they don't turn up it's a kick in the teeth'

'Having an unenthusiastic facilitator who does not direct you in anyway – needs proper facilitation'

'If you have to sit through something when they don't care or think a lot of themselves and it isn't very good'

'Potentially a stressor in 5th year if you have a dismissive group where no one is interested if you are thinking about introducing the mandatory teaching scheme'

An unpleasant attitude can also act as a barrier – whether it is exhibited in a self-glorifying way to deliberately catch others out or depreciating the value of PAL methods of teaching.

This was discussed at length and decided that a change in advertisement in the prospectus or the traits at interview should be examined. Some students may feel insecure in the quality and quantity of learning they have prepared for the session and use belittlement as a sign of frustration. Others possibly are insecure about the level of competition they feel from the group and as an alternative to working within the group to further the groups' knowledge, try to 'outshine' other members to become the 'alpha personality'.

'Bad thing about students left on their own to do questions is that some people will write some obscure knowledge questions for the sake of no one being able to answer it. People going on another level to show off'

'Passing on a culture, an attitude of ridiculing PBL that I hear when I first came I didn't like that. That's restricting people not intentionally but saying just do this or just give one perspective when I was in a session when someone disregarded the whole history of medicine. It is also from higher up health professionals, some from non-PBL courses'

Another barrier that is similar to what has been mentioned before about monitoring it as a method of teaching, it is hard to police properly. There are no assessments that can really effectively judge the progress of the teacher/students, excluding outside variables.

School teachers in the United Kingdom (UK) have been previously subject to a financial incentive scheme, "pay for performance" in 1999. Lavy (2007) reviewed a study set over a 2 year period where teachers were directly tied to their student's General Certificate of Secondary Education (GCSE) results and paid according to how successful the results were (Lavy 2007). It was observed that there were no improvements in certain subjects i.e.

mathematics and significant improvements in others. The problems with this type of system become apparent when the teachers begin to work towards the financial incentive as opposed to the welfare of their students. Fuchs & Stecker (2001) advocate a system of setting specific goals for the teacher and using computer-based system to monitor their progress electronically using a mix of student test results, feedback forms and self-evaluation (Fuchs, Fuchs & Stecker 1989). Other suggested strategies for monitoring are: recording teaching sessions for self-evaluation, student feedback, using questionnaires, focus group interviews with the students and peer feedback usually in the form of peer observation (Chan 2010).

'Hard to police this process'

'If teaching was made par for the course how would you guarantee it was well done because I'm sure everyone has had it where they are just doing it for the tick/fee and it isn't good'

Time was stated as a barrier. As there is no allocated time for such activities, students felt restricted by their conflicting timetables. Either, the teacher and the student could not find a suitable time for both their schedules and the student felt that they were using up valuable time within their teachers' timetable and felt embarrassed to ask for more sessions. In addition, a session that is not mandatory for students will encourage less people to attend as they do not feel compelled by the university to go.

'Difficult to create specific time in curriculum for PAL but if you didn't create a time there will always be people saying it isn't compulsory and they don't need to go'

'2nd year session were good – were they fully inclusive time-wise?'

5. <u>"Medical students with better understanding of teaching become better learners" (Yu et al. 2011)</u>

All students strongly agreed that a better understanding of teaching will lend itself to improving self-learning.

One student was interested to know about her 'learning style' and wondered if it could determine it for you as a strong style would become apparent as you taught more.

'It might make you more aware of how you learn better – i.e. audio, visual types of learning. Increasing your self-awareness'

Others agreed and stressed that it was a reason to implement a teaching course within the curriculum.

'If you're taught how to teach you are learning techniques/ways of portraying and finding information which will translate into your individual learning'

'I'd like to go on a teaching course to give you pointers and explain areas that you are struggling with'

'Even if it doesn't make you a better learner, just knowing a better way of imparting knowledge when you teach. People might think I don't need a course because I can talk to people but if it gave you ideas, pointers, phrases it will improve you regardless of how

competent you already are. If your individual learning style doesn't improve your learning capacity can'

The students also discussed the benefits that are associated with teaching to learn, mostly the reciprocal benefit.

'You learn through teaching as its only conducive to learning, You have to go away and learn it before you teach, you can't do one without the other!'

'Teaching benefits the teacher more as they should learn it inside out'

'It becomes active learning'

'Audience should remember it well if you deliver it well but you are consolidating – long-term benefits. Also highlights the gaps in your knowledge'

6. <u>"Teaching is essential physician-patient interaction; you become a more effective communicator from teaching" (Yu et al. 2011)</u>

All students strongly agreed with the necessity of good communication within medical practice and stemming from that an efficient communication skill set learned through teaching will foster a good relationship between patient and doctor.

'Don't think you can teach well if you cannot communicate. You can have all the knowledge in the world with the deepest understanding but if you can't communicate then at the end of the day it is useless. Part of our job is to educate patients and students but no communication skills makes it pointless'

One student queried, *'Can you learn it?'*

The remainder of the cohort considered the positive skills that come from teaching/communication and the impact it would have on their future careers.

'People who don't teach/work in groups tend to talk over each other and don't seem to know how to voice a point properly without arguing' Not go the skills to get across properly and not an environment conducive to learning'

'Important skill for when qualified; you are in a team, need to communicate and get important information across in a way people understand'

'A strength of PAL is communication because you learn to stand up and state what you've learnt. Helps with confidence getting something from inside your head out to an audience'

7. <u>"Medical students interested in teaching will become future educators" (Yu et al. 2011)</u>

The students were generally more negative about the above quote, mostly disagreeing with the progression from teaching in medical school to being involved in Medical Education as a career.

'I went to all the teaching an I am keen to teach – always correlation to when exams are near to how many people turn up but I don't know if it's just progressing through medical school and realising how important it is to teach kicks you into wanting to teach'

'Depends if you're confident or not and if you're really enthusiastic for extra teaching it doesn't mean you will end up teaching in future just that you want to learn and are keen'

'Don't agree – if you want to teach a student doesn't mean you want to go into academia. Maybe someone has taught you and you found it helpful and you want to give back to other years. I did a lot of teaching and I don't see myself as an academic or going that path – I want to be a clinician but if students want help then I'm more than happy to teach them. I don't think everyone that teaches wants to be the next sub-dean!'

'Many consultants really good at teaching but would not be good in education posts'

Nevertheless, three students agreed saying they would like to go into education as part of their careers and were very interested in teaching presently.

'I would be keen to teach and in future a role to take on part-time because I think having had the experience of people being keen to teach positively it would be good to continue that'

'Doesn't need to be your only profession but you could extrapolate your interest in teaching formally without doing it all the time'

'Personally I would want to do it because it is another aspect of job that I would find interesting'

Some students had recent experiences of 'teachers' from the Academic Pathway and were fairly complimentary about their teaching methods'. FY1s, at the beginning of 5th year, are given the opportunity to choose the 'Academic Pathway' when entering the Foundation Programme Application System (FPAS), whom allocate medical student jobs, nationally. The Foundation Programme is divided into six jobs, each four months long, over a period of two years. Being an 'academic' FY1 allows the junior doctor to use a rotation to do research in their area of interest; educational, lab or patient based. As there are approximately only 10 academic job per deanery, competition has increased in the last few years and FPAS have responded by implementing an interview scheme for applicants. Applying to the academic programme does not affect the chances of students being allocated job through the standard system, they are removed from the pool of students only when they have successfully interviewed.

'She was very good F2, clinical background and related to education so I think there should be more academic education posts. More co-ordination with the academic pathway'

'I got a different aspect from being taught by clinician or an academic fellow – sometimes I

feel because I am only interested in being a clinician I am only receptive to them'

8. <u>"Exposure to teaching principles should be in a sequential manner from undergraduate level and continue in postgraduate education" (Yu et al. 2011)</u>

Overall, the students agreed with the above statement and said they had mentioned it above in relation to talking about teaching from 2nd year right up to 5th all the way through medical school however they acknowledged that it may not be same mode of teaching.

'Its different teaching postgraduates I imagine. Medical students teaching other students is one perspective and then when you start working it will change because you change'

'Peers will change'

One student proposed a short course about teaching as time will be of the essence at postgraduate level and difficult to keep people engaged.

'You could have a refresher course on teaching to remind people. If it became like those mandatory health and safety talks, no-one would listen so needs to keep their interest'

9. How do you feel about utilising social media i.e. FaceBook, Twitter, DropBox in
    medicine?

The overriding view of both cohorts was that social media such as FaceBook was an easy and
acceptable form of communication. When used appropriately; to organise teaching, share
resources etc. it was a good way of forming relationships between PBL /hospital groups,
doing group work and likening it to an extra-curricular activity that can be kept private. The
students perceive the university communication to be less effective for activities such as
group work, where it is difficult to have multiple messages sent at the same time without
confusion. The messaging system on FaceBook allows a message 'thread' to be set up where
selected people can see all messages at one time and permits them also to see when a
message was seen by a particular person. The students preferred to have a form of
communication that they regarded as private, not monitored by the university.

'Don't think faculty should be discouraging it?'

'We are just trying to help each other out'

*'I think FaceBook is a better form of communication in terms of layout then say our
university emails'*

'Very quick and easy if everyone is on FaceBook'

'Had a group for our hospital group and we used it to organise teaching sessions'

'It can be created privately so no reflection on you or anyone else. Don't know how it would reflect badly if all we are talking about is teaching though they might be picky and ask if we can go through a secure social network'

'We're not sending past papers or things we shouldn't be just OSCE/LOCAS references or resources'

One student explained the confusion they felt in an experience in 1st year, shortly after they had started medical school. A lecture was given to all students discouraging the use of social media and the potential extreme consequences that could result when in the same day they were actively encouraged to use social media to further their group learning in a PBL session. They felt these conflicting views were inappropriate to students as impressionable as 1st years and contradictory to all other years.

'Lecture in 1st year was very powerful saying no don't use it and then walked into PBL and they asked us to set one up – very confusing message'

Conversely, they also agreed that there are students who use it inappropriately and understand why the university have in the past always tried to discourage active use of social media in any form by medical students.

'There are negative cases i.e. a false list for the exams in our year'

'There's not a lot you can do about people being horrible people regardless of social media'

'Some are inappropriate and this is unacceptable'

'Important to bring up that not everyone has FaceBook or any form of social media – maybe not even access to Internet. They are disadvantaged as people seem to forget about this issue and not make an effort to contact them. Bad for group work'

'Becomes an issue if someone is inappropriate – are you a colleague or friends? Who do you take it to?

The students established that students should be warned about the potential dangers of not being sensible 'online' and given a factual representation in the form of a lecture of the consequences without using unrealistic 'scare tactics' that some of the students had recently experienced.

'I think just one lecture of ground rules from GMC perspective for us to realise that some things are inappropriate, important that to be part of this profession you need to be appropriate and respectable but no need to take it further'

'Some 1ˢᵗ years come away from the 1ˢᵗ lecture saying "I need to delete everything" – they are really impressionable. Faculty hammer it into you that using social media will be the end of your career. Someone has said to me that she can find everything about me regardless of the privacy settings. It's ridiculous, scaremongering'

'Only needs taking further if keeps happening – do need to stop incidences though'

'Keep it balanced – give some practical advice about privacy settings, no comments about medical school. More specific guidance needed'

 The idea of a secure social networking site affiliated with the university was brought up but it was met with reticence as the students did not feel it was merited.

'Vital forum in FaceBook layout, don't think would work – it isn't convenient logging onto something else and would the university want to be monitoring something else? I don't think so!'

All students commented that DropBox – an online storage for resources such as written notes, presentations, audio files etc. was an extremely useful tool and as a hidden side to PAL. However the university is not affiliated with DropBox and is forbidden from advocating it as an educational tool (Gannon & Hill 2012).

'DropBox has taken off with sharing resources – PAL at its best'

10. <u>Any other changes for Peer Assisted Learning or curriculum Review – any other comments you would like to add to the discussion?</u>

One student was eager to summarise the positive benefits she had previously experienced with PAL and was encouraging about introducing methods to further police and monitor so that a more standardised system would become available in the future. The student also stressed that further clarification of the role of the 'mentor' was needed for the system to improve.

'Additional PAL would be beneficial, as PBL comes under remit of PAL that's a good aspect but then a lot of informal teaching received as 2nd years and done as 4th years if organised through hospital and 2nd year reps and LMSS things like that they've all been positive experiences so anything that's added would be a bonus for the course. So I think it's a good thing, what we've had in the past has been positive, anything else we get, I understand it's difficult to get say more structured formal sessions just cos there are timetable constraints and peoples' willingness and enthusiasm to teach so it's not going to be easy so it's not going to be a cut and dry this is what we need to do etc. but if we were going to increase it it would be good and we talked about the mentor-mentee system, new system, having its problems but it might take a bit of time before we adapt it...And a bit more direction. It's are you being their mentor from an educational point or are you supporting them because finals are stressful? Are you meant to be teaching them? Just that PAL forms integral part of our curriculum without being necessarily transparent about it. Good way to learn and I feel you retain more.'

A couple of the students reiterated the benefits the felt that the peer environment offered them and the value the placed on the reciprocity of the system. The consolidation of knowledge through teaching others was considered an incentive in itself to better their own learning.

'I think most valuable thing about PAL is that students get taught by people who can relate to them directly and know what they need to know, I think that's really valuable. And also the fact that the students who are teaching, learn as well, not just how to teach but what they're teaching. Practising and getting used to teaching when you're a medical student is much better than fumbling about when you're a doctor.'

'it's much more informal with your peers so you're not as reticent to ask them questions, you find them much more approachable, you can ask further into it whereas if its a lecturer coming to you with extra knowledge its like oh its too much. Also the benefit for the student, not just the people learning from them but its really benefits the student, it reinforces PBL and the messages of PAL. You learn good communication from it, learn how to explain things on a different level, you learn so much and obviously you learning that specific topic as well
'because it is that informal thing and because it allows, its usually in small groups as well, it does allow the opportunity for someone to ask a questions and not as intimidating as asking someone senior and you can have that, allowing to ask questions and asking people to properly explain things and for those explanations to be on more of a relatable level. If it is made very much clear that it is so important for the 'teacher' to teach as well that it is really a positive thing and it just has to be encouraged but just actually having more of it.'

The chance to consolidate knowledge using both perspectives was particularly appealing to one student who not only valued the knowledge gained as a student but the hindsight that

comes with learning from their peers. They were able to give insight and tell narratives from previous experiences that were helpful in the students' subsequent approach in her forthcoming placements.

'The reciprocal benefit, the two way thing is really key. And the thing I've mainly picked up on it which is basically hindsight and experience. Someone else's hindsight an experience, even if its not directly the same, even if its just the way that they deliver a teaching session, its because they've had a good teaching session, noted what was good and bad about it and passed on the good about it to other people. I think the hindsight too for example I've just done Paeds at AlderHey and as my first rotation it was a bit like aah, and now my friend has got it I can say to her can I just suggest that you pick a week for each system, you try and pick a ward, then you look at the book because you have to do it yourself it's not there. If somebody had given me all that information at the beginning of the rotation I would have been like great! I can go in knowing what I need to do here. Before you know it its 7 weeks gone and you think oh that's what I was meant to be doing and its finished now. So I think that's the best thing about PAL.

For those students that felt they were not best suited to a traditional lecture based curriculum, this approach seemed to be most appealing. In a practical sense, they were able to make the session interactive rather than being talked at from the front of a lecture hall and learning passively.

'I don't actually think I could learn on just a lecture based course so for me it's I have to learn through PAL. And I learn with my friends, OSCEs especially, and mentors as well, their hindsight and their experience. And I remember especially my first OSCE formative, and the

summative as well, just knowing what to expect because otherwise you have no idea. Just for someone to be there to say this is what it's going to be like, this is what happened to me and just how it runs I think that's so crucial to just have someone's wisdom. '

'I think the good things are that it benefits both parties and because it can go more of a discussion than a lecture I think you both learn more from it.'

The participants were informed that if they thought of anything pertaining to the discussion after they left the session they were encouraged to email VT with their remaining thoughts and these would be included in the transcript. A group of students often forgotten about as they are a small minority; are the graduate students who are not on the 4 year graduate entry scheme but are entered onto the 5 year MBChB with the undergraduates. This student felt more support was needed for this group of students in terms of having an appropriate peer group that were able to relate to them in the same fashion.

'As a grad on the 5 year course I didn't feel the mentoring I could get from the UGs quite related to me with more life experience and previous uni experience etc. So I felt we were forgotten about a bit (as grads on the 4 year mentor the year below each year). I felt quite lost and isolated in some ways, so I definitely think having some mentoring from another 5 year course grad would have helped the overall experience.'

<u>Results of the nominal group</u>

The results of the nominal group will be discussed in this section. The study was explained to the participants at the beginning of the session as well as being given a consent form and introduction sheet. It was made clear that were the participants uncomfortable within any parts of the process they were free to withdraw from the study at any point without any impact on their medical studies.

Unfortunately, again there were two students that were unable to attend on the day of the session bringing the number of participants of the nominal group to 13 students. This was still considered a feasible number to perform the Nominal Group Technique with (Lloyd-Jones, Fowell & Bligh 1999). The students fulfilled the 'Silent Phase' as explained in chapter three for approximately 20 minutes without conferring with each other.

Three baseline questions, identical to those asked first in the focus groups, were asked within this stage with each question on a separate sheet of paper. These questions were:

1. What do you understand by term Peer Assisted Learning?
2. What are your experiences of Peer Assisted Learning?
3. How would you improve Peer Assisted Learning within the current curriculum?

They were then randomly allocated into 2 groups, one of 6 students and the other of 7 to begin the 'Item Clarification' process. No items were discarded at this point. Having exhausted all the items on every individuals' list they were then asked to vote on an order of importance of the items they had proposed for each baseline question they had been asked.

Once this was complete the groups were combined with the researcher acting as scribe and repeated the process of clarification and voting until there was a concise list indicative of items in relation to the baseline questions that were most important to the students. The list had to be unanimous to all the students involved.

Table 3. Demographic classification of nominal group

Group	Demographics
Nominal Group A	Male = 2 Female =5 1 x 2nd year 6 x 3rd year
Nominal Group B	Male = 1 Female = 5 1 x current intercalating student 1 x grad entry 3rd year 4 x 3rd year

Table 3 contains the demographics of the sub-groups created when the participants were randomly allocated into two groups. The breakdown of gender and year is shown. The nominal group consisted of 12 students that were 3rd year or below, in comparison, to the focus groups that contained 4 students of this calibre. Students were allocated randomly with no prior allocation from VT. They were given the choice of three dates from which they were asked to attend one of three sessions according to an open space in their timetables, not interfering with scheduled university placements. It is possible that a large number of 3rd year students had a collective lecture or an SSM day on campus, therefore influencing how many were able to attend the nominal group session as opposed to the focus group session. It was not intended for there to be a 3rd year bias within the nominal group however it should be acknowledged.

The table below demonstrates the responses of each respective to group to each basic question and the result of the voting process within each group as what was most important to each group.

Table 4. Results of nominal group subsets 1 and 2

What do you understand by Peer Assisted Learning?	
Group 1	*Group 2*
1. Mentor in same course (older to younger years), gaining/going over new knowledge. Providing academic or non-academic advice and should have previous experience in aforementioned situations. 2. Different learning methods i.e. explanations/quizzes/comparing knowledge 3. Sharing resources 4. Similar characteristics of people together and groups of students working together with one aim. 5. Informal OR formal teaching 6. Focus on academia 7. Acknowledging gaps in knowledge	1. Students teaching students 2. Teaching from older years – gauge what level needed for exams 3. Learning from other students of other medical schools 4. Getting together with people in your year 5. Discussion to help understand concepts 6. Sharing resources, notes and advice between peers – DropBox 7. Practical skills i.e. OSCE 8. 1/1, groups, hospital, PBL 9. Formal i.e. 4^{th} – 2^{nd} year teaching 10. Informal i.e. Spontaneous ward teaching 11. Vital discussion board
What are your experiences of Peer Assisted Learning?	
Group 1	*Group 2*
1. OSCE practice with mentors and other students i.e. in 1^{st} year 2. Teaching mentees – OSCE and S&F 3. Year rep teaching – organised with	1. Older to younger years 2. Interactive sessions most effective 3. Direct teaching – guidance for what is important

older years 4. Met up informally in groups to teach each other 5. Teaching from 4[th] year mentors – informal/formal, teaching once a week in hospital, print out notes given to students 6. Clinical skills revision sessions run by 5[th] years 7. Non-academic mentoring 8. Discussions on Vital 9. PBL 10. Arranged outside of medical school	4. PBL 5. UCCT 6. Advice – academic and non-academic 7. Sharing resources

How would you improve Peer Assisted Learning within the curriculum?

Group 1	*Group 2*
1. Meet & Greet situation in groups of people = less intimidating. People with mutual interest become mentors/mentees to give proper teaching/training. 2. Scheme to make people interested in teaching i.e. reward scheme 3. Sharing more resources 4. University arrange teaching – receive certificates? 5. PBL changes so can teach each other – all contribute by comparing knowledge	1. 5[th] year/intercalating students join a programme to teach 1[st]/2[nd] years throughout the year – guides the younger years and keeps their knowledge fresh e.g. every fortnight 2. More students involved in teaching ethos of PBL – 'peer schemes' 3. Matching 5[th] to 4[th] years and 4[th]/5[th] to 2[nd] years – will improve examination technique and keep knowledge fresh for 5[th] years if they participate in teaching. 4. Timetable allocated time for

6. Allocated time to meet up – give platform for discussion	consistent bedside teaching 5. Incentive for training 6. Use of feedback forms as proof
Most important to Group 1	**Most important to Group 2**

1. Mentor in same course - older/same year i.e. 'Buddy Scheme'
2. Meet & Greet – match mentees/mentors with mutual interest
3. Reward system – scheme to make people interested in teaching e.g. certificates for portfolio from medical school
4. OSCE practice with mentors and other students – resources (models) should be supplied by the medical school
5. Structure & Function teaching for younger years
6. Different learning methods e.g. quizzes
7. Sharing resources
8. Arrange formal teaching from other years (classroom environment) – medical school responsibility not as currently has been taken on by year rep of students society
9. PBL more focused on teaching rather than 'sharing'
10. Be given mentors from same hospital with time to meet up
	1. Direct teaching from older to younger years
	2. PBL format to be more like UCCT format
	3. Indirect sharing of resources to be used more universally
	4. Lack of a year divide is good – product of PAL
	5. Unofficial teaching i.e. between friends should also continue
	6. Improvements
	   a. 5^{th} – $2^{nd}/1^{st}$ year matching academic programme not in hospital
	   b. 4^{th} years matched to any lower year in hospital using programme of ward/bedside teaching
	   c. Peer mentoring continue
	   d. Universal DropBox

11. 5[th] year OSCE teaching and PBL facilitating 12. Providing social support as well as academic to mentees and arrange to see outside medical school 13. Discussion forum on Vital for resources etc. like FaceBook group but approved?	

Themes generated from the focus groups, in particular from the baseline questions, were used for guidance in the nominal group. The points highlighted below state the items in order of highest to least importance that was the result of the entire nominal group cohort (n=13) after the voting process of both previous lists was complete.

1. Direct teaching from older to younger years

2. Matching of suitable mentors/mentees in a tier system.

    a) Role of mentor needs to be clarified as social/academic role.

3. Resources sharing across all years

    a) Use DropBox as a template type of system

    b) Rating system possibly be introduced

4. Hospital based mentors

    a) Can be difficult if your base hospitals are different i.e. Southport to Royal is impossible.

5. Attitude towards PBL changes

    a) Focus on teaching each other

    b) More of the structure of CCT format teaching

6. Continue all unofficial teaching

    a) A worry that if PAL is formalised that it will become a 'hoop-jumping exercise'

Development of questionnaire - Thematic similarities between focus and nominal groups

The focus and nominal groups were initially only used to provide topics and inform the development of the questionnaire. However, through thematic analysis it was found that the results of the focus groups provided additional information that was not only useful but was thematically similar to the qualitative responses from the questionnaire. Therefore, triangulation was straightforward. The email responses from the students piloting the questionnaire were used for validation (see Chapter 3) and to ensure triangulation also.

Throughout both the focus and nominal group analyses, a directory was kept by the researchers in order to note any thematic similarities. Any themes that were discussed in both groups were highlighted for future use when developing the questions for the main body of research, the questionnaire. Additional information was also kept in a miscellaneous category and not discarded.

Both the nominal and focus groups had been asked the same three baseline questions. Therefore it was simpler to analyse these together and directly compare the responses. In looking at this defining exercise many students came up with varying degrees of the same definitions, mostly students teaching students or talking about specific peer groups assimilating and cementing knowledge in a friendly environment. Although these responses were very interesting it was decided that a wider cohort of 'definitions' would not add significantly to the body of research because of the rapid saturation of themes already grasped. For this reason, the title of the questionnaire was 'Peer Assisted Learning (PAL) 'Students teaching students' in order to give the cohort an idea of what we were asking them about without asking them to define the term themselves.

Looking at PAL experiences of both groups, they all underwent similar occurrences throughout their varying times at medical school. Many of them identified different experiences of mentoring; according to year and placement i.e. some had mentors in place at Aintree University Hospital however no such schemes were available in placements such as Southport & Ormskirk Hospital or Warrington & Halton Hospitals. Other common themes were exam techniques and mentoring from this direction i.e. LOCAS – an exam they complete in the end of their 4th year which is a practical exam involving history and exam of real patients as opposed to simulated patients.

A lot of students focused on the new mentoring system put in place by the university in September 2013 and the issues surrounding this contrasting with the previous mentoring system by the Liverpool Medical Students Society. The majority of students in both groups praised the extra-curricular teaching that they had received whether it be from friends they knew outside of the medical school or from involving themselves in the many sports, music, academic societies that Liverpool has to offer; customarily associated with the Liverpool Medical Students Society. Having listed all the experiences that the students had mentioned it was challenging to find a system of asking our eventual large cohort about these experiences in a concise and clear manner. In light of the vast various year-specific experiences i.e. F1 shadowing in 5th year, LOCAS, 4th year mentoring in 2nd year it was decided to enquire about the experiences of PAL by year and ask the students to grade these as to how useful they had been to them on a Likert scale. A 'Did Not Experience' option was also included to see whether the majority or the minority were receiving these experiences regularly throughout the years.

A review of the recent curriculum changes were verified before incorporating into this part of the questionnaire as it was ensured that experiences that they should have had according to the curriculum were covered as well as any surplus experiences that had been given during the focus or nominal groups. Looking at the data it was assumed that many of the experiences in Year 1 and 2 overlapped, therefore these years were combined. Having asked about certain experiences in Years 1-5 the following question was an open-ended qualitative question 'Have you had any other PAL experiences in any other year?' This was included in order to capture any other experiences that had not yet discovered that currently existed.

Since the last question covered the topic of improving PAL in the current curriculum this became the next question of the questionnaire. A similar theme that was prevalent throughout both methods was the introduction of more valuable incentives for those keen to teach or initiating a change in the portfolio to include in a teaching scheme. The matter of sharing resources was also popular in which many students expressed that an online website 'DropBox' was increasing in popularity with students. The site is used as a storage facility for students to store presentations, notes, videos in which are password protected. However, for example, one student had set up one specifically for their year in which helpful resources they had found and wanted to share with the year – in which case the whole year were given the password using social media and the feedback was increasingly positive. For many reasons, the resources on that particular account had been greatly supplemented since. DropBox, as mentioned earlier, is not associated with the UOL and is not recommended by the UOL (Gannon & Hill 2012).

Subsequently, some students expressed interest in an all-inclusive universal sharing of resources across all years. A popular theme amongst all groups were differing suggestions for improvements of PAL within the current curriculum thus leading to an open-ended qualitative question 'Can you think of any other improvements?' that would hopefully lead to a much wider selection of suggestions than we had previous from the thirty students currently involved in the development process.

The idea of a training programme was borne from the innovative ideas of improvements and was a significant thematic similarity. Initially, it was interesting to note how many students in the focus groups were opposed to the idea and how many were for it. In this case it was thought to get a wider consensus by asking a simple 'Yes/No' percentage of those in favour and asking 'Would PAL training be beneficial?' Leading on from this the format of delivery was called into question largely from the nominal groups only.

All students within the focus and nominal groups acknowledged that there were obstacles that were difficult to overcome for this process to work. Particular areas of concern included the many monitoring adversities and how exactly a process such as this could be monitored at a satisfactory level, guaranteeing that all students were to receive the same standard of education. Another area was the enthusiasm for teaching and learning from either perspective – students that were disengaged with the process were in their experience difficult to teach and conversely, students who taught with a lack of interest in teaching did not receive good feedback. In this case, the main barriers were listed within the questionnaire and students asked to rank the barriers in a hierarchical manner using a Likert scale of 'Major Barrier' to 'Not a Barrier'. A deduction could be made from the results which barriers would affect the

quality of teaching and steps could be taken to alleviate and enforce change to facilitate improvements in the current system according to the most concentrated areas of concern.

On the other hand, though the students were fairly astute in acknowledgement of barriers they had endured, they also praised the different skill sets they attributed to having been involved with processes such as Problem Based Learning, which accommodates and utilises many of the same principles as Peer Assisted Learning (CF Chapter 1). Poignantly, the majority of the older years were able to comment reflectively on all areas of the course. In particular, those who had intercalated in lecture based courses, focused on the benefits they felt working within PAL environment had given them, enabling them to work in teams and communicate their points clearly during their intercalation. They felt that they would not have been able to perform certain group tasks as efficiently, learning how to delegate, explain their opinions in a non-confrontational manner and communicate ideas effectively had they had not the previous experience of PAL. However, this was only realised with hindsight, having completed a degree not based around group interaction.

Social media was an especially interesting topic of discussion across all groups, generating many different opinions and therefore it was decided to include a question about this.

Broad areas of thematic similarities between focus and nominal groups:

- Existing experiences of PAL

    o Mentoring system – pre-2013/post-2013 systems

    o Within the curriculum – PBL, UCCT, Hospital systems, exams, 5[th] year differences

    o Outside of the curriculum – informal teaching

- Improving the curriculum using PAL

    o Incentive schemes

    o Making students more aware

    o Allocate opportunities and time

    o Make it easily accessible in terms of resources, environments, awareness

- Training programme to inspire confidences and introduce teaching as a 'speciality'

- Barriers

    o Attitude and enthusiasm from either perspective

    o Monitoring system

    o Alleviating conflicting schedules

- Encouraging attributes gained from PAL process

    o Teamwork, communication, ability to improve confidence in presenting

- Role of social media and what components of learning it is used for

The questions in the questionnaire were developed using the topic areas listed above and subjects discussed in both focus and nominal groups. The final questionnaire can be seen in the Appendix.

As mentioned before the focus groups were able list valuable learning opportunities (see pages 92) that they found helpful such as inter-year bedside teaching in hospital, hospital mentoring programmes and help with practical skills in OSCE or LOCAS (year-dependent). They also mentioned an 'informal' curriculum of teaching from extra-curricular activities they were part of or from friends in older years (see page 94). As there were many different opportunities, the best way to categorise them was according to year – leading to Question 1-5 of the questionnaire i.e. 'How did you find your experiences of PAL in 3rd year?' which had experiences such as extra-curricular teaching, having a mentor, PBL and hospital partners that they were asked to rank in order of how useful they found each experience was. The following, Figure 14, will show which of the parts of the questionnaire were related to which parts of the focus and nominal groups.

Table 5. Themes taken from Focus/Nominal Groups for questionnaire development

Question	Where did it come from? FG = Focus Group / NG = Nominal Group
Q1. PAL experiences in 1st/2nd year	
- Being University mentee	- FG (p100)
- Being Y2 Buddy (LMSS Mentor)	- NG (page 131) , FG (p94)
- Having a Y2 Buddy (LMSS)	- NG (page 131) , FG (p94)
- Extra-curricular teaching	- NG (page 131) , FG (p94)
- PBL	- NG (page 131-2) , FG (p94)
- UCCT	- NG (page 131)
- Hospital partners in 2nd year	- FG (p96)
- Teaching from 4th year 'hospital mentors'	- NG (page 132) , FG (p92-30)
Q2. PAL experiences in 3rd year	
- Being University mentee	- FG (p100)
- Being University mentor	- NG (page 131) , FG (p94)
- Being Y2 Buddy (LMSS Mentor)	- NG (page 131) , FG (p94)
- Having a Y2 Buddy (LMSS)	- NG (page 131) , FG (p94)
- Extra-curricular teaching	- NG (page 131) , FG (p94)
- PBL	- NG (p131 -2)
- UCCT	- NG (p131)
- Hospital partners	- FG (p96)
Q3. PAL experiences in 4th year	
- Being University mentee	- FG (p100)
- Being University mentor	- NG (page 131) , FG (p94)
- Being Y2 Buddy (LMSS Mentor)	- NG (page 131) , FG (p94)
- Having a Y2 Buddy (LMSS)	- NG (page 131) , FG (p94)
- Extra-curricular teaching	- NG (page 131) , FG (p94)
- PBL	- NG (page 131-2) , FG (p94)
- UCCT	- NG (page 131-2) , FG (p94)
- Hospital partners	- FG (p96) , NG (131)
- Being a 4th year hospital mentor	- FG (p93)
- LOCAS	- FG (p94-5)

Q4. PAL experiences in 5th year	
- Being University mentor	- FG (p100)
- Being Y2 Buddy (LMSS Mentor)	- NG (page 131) , FG (p94)
- Having a Y2 Buddy (LMSS)	- NG (page 131) , FG (p94)
- Extra-curricular teaching	- NG (page 131) , FG (p94)
- Taking a PBL group	- NG (131-133) , FG 92-4
- UCCT	- NG (page 131-2) , FG (p94)
- Teaching students in hospital	- FG (p92)
- Shadowing F1	- FG (p92) , FG (p118)
Q6. Please state how important you feel the following suggestions for improving Peer Assisted Learning would be to you:	
- Implement a reward/incentive scheme for people interested in teaching i.e. certificate for portfolios	- NG (p132) , FG (p105) - NG (p133) - FG (p99-100)
- Universal sharing of resources i.e. Dropbox	- NG (p132)
- Given time within schedules to meet mentors for allocated teaching/concerns	- NG (p133) , FG (p99)
- 5th years and intercalators to be involved with teaching 1st/2nd years basic sciences	- FG (p99)
- Include ward time in hospital with 4th/5th years	- NG (p133) , FG (p100) - FG (p99)
- Standardise PAL within hospitals across trusts	
- Having PAL/teaching as part of 5th year portfolio i.e. a teaching day so less time is missed off wards	
Q8. Would it be beneficial to have PAL training?	- FG (p100-103)
Q10. How much of an impact do you feel that the following barriers have in relation to PAL?	
- Relying on someone else' knowledge	- FG (p109)
- Lack of enthusiasm	- FG (110)
- Policing quality of teaching is hard	- FG (p101/112)

- 'Showing off' by using obscure depth of knowledge that is not conducive to your learning - Having disinterested group of students being taught - Time constraints	- FG (p111) - FG (p110) - FG (p99/112)
Q12. To what extent do you agree/disagree that PAL encourages the development of the following attributes? - PAL - Teamwork - Communication - Reciprocal benefit for teacher and student - Ability to present to your peers	 - FG (125-128) , FG (p114) - FG (125-128) , FG (p115) - FG (125-128) , FG (p102), FG (p116) - FG (125-128) , FG (p103) , FG (p108) - FG (125-128) , FG (p102)
Q13. To what extent do you agree/disagree that PBL in the current curriculum encourages PAL in the following areas? - Learning - Teamwork - Communication - Reciprocal benefit for teacher and student - Ability to present to your peers	 - FG (125-128) - FG (125-128) - FG (125-128) - FG (125-128) , FG (p111) - FG (125-128) , FG (p111)
Q15. Do you use the following social media for PAL?	- FG (p121-124)
Q17. Which of the following do you use social media for?	- FG (p121-124)

Summary

This chapter has examined the results of the nominal and focus groups. The thematic similarities between the focus and nominal groups have been noted and their primary aim to provide topics for the questionnaire had been achieved. The development of the questionnaire from the thematic similarities has also been discussed. It has also been observed that the focus groups results in particular have yielded useful additional information in their own right.

The subsequent chapter will display and discuss both the quantitative and qualitative results of the questionnaire. The quantitative results following statistical analysis using T-tests will be examined and clarified.

Chapter Five – Questionnaire results

In this section, the results of the questionnaire will be discussed. The distribution of the questionnaire was explained in detail within the Methods section. The majority of the respondents accessed the questionnaire online as opposed to using paper, from which 63 questionnaires were gathered. Consent forms and information sheets were available in both instances and through the recruitment email that was sent along-side.

Results

Excluding the 1^{st} year population; the study population in this thesis encompassed the undergraduate population for 2013-14, of which there are 1333 students. Of the 1333 students that were approached, 709 students (53.29%) participated in the questionnaire. Table 7 below, shows the breakdown of the students within each year that completed the questionnaire. 67 (9.45%) copies of the questionnaires were completed in paper format and the data was entered by the researcher rather than online completion.

The response from the 3^{rd} years was the largest cohort with 200 (67%) students completing the questionnaire. With the exception of 4^{th} and 5^{th} year cohort all categories achieved a satisfactory response rate of more than 50%.

Table 6. Breakdown classification of student intake 2013-14

Year	No. students 2013-2014	No. of respondents	% respondents from each year (%)	% respondents of questionnaire (%) i.e. x% respondents were 2^{nd} years
2^{nd}	296	**179**/296	60	25.57
3^{rd}	313	**210**/313	67	30.00
4^{th}	366	**148**/366	40	21.14
Intercalating (currently)	83	**42**/83	51	6.00
5^{th}	275	**121**/275	44	17.29

Two hundred and sixty five male students (37.75%) and 437 female students (62.25%) participated, which is representative of the demographics within the medical school so therefore indicates no overwhelming gender bias within the responses. The age range of the respondents was 19-33 with the mean age of '22.5' years of age. The majority of the respondents, n = 642 (92.11%), had not done a degree previous to medicine however within the cohort of graduate entry students, n = 55 (7.89%) the most common degree undertaken was BSc Biomedical Sciences (n=12, 21.18%). Students that were currently undertaking an intercalated degree in 2013-14 were all invited to participate – regardless of whether they were internally intercalating in the University of Liverpool or externally intercalating. Of the 83 students that are currently registered on an intercalation, 42 (51%) responded. The most prevalent courses were BSc Pharmacology (n=10, 23.80%) and MSc Humanitarian Studies (n=9, 20.45%). Incidentally both courses are based in UOL with the latter being based the Liverpool School of Tropical Medicine. These numbers could be due to the increased intake of students on these courses in comparison to others. The 5[th] year cohort contained 28 (23.14%) of students that had previously intercalated in 2012-13.

The SPSS statistics programme was used to analyse all quantitative data from the questionnaire. In order to translate the Likert scale that was used into numerical data, the database allocated a number per response. For example, a question with the answers "very useful" to "did not have this experience" corresponded to the numbers 1-5 i.e. "very useful" was given "1". Firstly the data was analysed using descriptive statistics i.e. percentages of each response to each answer. Secondly, individual unpaired T-tests were run to compare the responses between the differing years of the respondents in order to identify any obvious differences between particular cohorts. Significant differences were analysed and anything

less than 0.05 was noted as statistically significant, with any results less than 0.01 being very statistically significant.

When looking at the raw data for each question it was noted that some students answered questions that they shouldn't have. These results were subsequently taken out of the data i.e. a 2nd year student should not have answered question about PAL experiences in 5th year as they had not yet experienced this. There were 20 results that had to be disregarded in the second question and 55 results in the third question disregarded because of this reason. One hundred and fifty seven responses were discounted in the question about experiences of PAL in 5th year because the students were not in 5th year and had not yet experienced that year.

<u>Raw Data</u>

The tables below illustrate the figures taken directly from the responses of the questionnaire for each quantitative question in both percentages and number format. An explanation of the results follows and the statistical breakdown of the results showing the most common answer for each question is also below. The largest contributors, in terms of year, have also been identified for each question. It was also discovered that nine students had failed to complete the year of study alongside some other questions. Therefore, these nine sets of data were excluded from statistical analysis as it was not possible to include them due to their missing year of study considering this was the differentiating factor for the analysis. The statistics below are from 700 possible sets of data, not 709.

Table 7. Numerical breakdown of results of Q1 'How did you find your experiences of PAL in 1st and 2nd year?'

	Very useful	Useful	Quite useful	Not useful	Did not have this experience	Total students answered this question
University Mentor system 'Being a mentee'	6.1% 38	15.1% 94	16.1% 100	23.6% 147	39.1% 243	622
Being a Y2 buddy – LMSS mentors	10.8% 68	18.5% 116	17.8% 112	16.1% 101	36.8% 231	628
LMSS mentors – Having a Y2" buddy	11.9% 74	17.1% 107	14.3% 89	14.4% 90	42.3% 264	624
Extra-curricular teaching i.e. from sports clubs/friends	26.5% 168	26.9% 170	14.8% 94	6.3% 40	25.4% 161	633
PBL	5.9% 37	28.0% 176	43.1% 271	19.6% 123	3.5% 22	629
UCCT	56.2% 356	23.5% 149	13.2% 84	3.6% 23	3.5% 22	634
Hospital Partners (in Y2)	25.1% 159	32.1% 203	25.4% 161	10.7% 68	6.6% 42	633
Teaching from 4th year 'hospital mentors' (in Y2)	35.1% 221	23.3% 147	13.2% 83	5.1% 32	23.3% 147	630

There were 700 valid responses collected from the questionnaire distribution from which the following statistical analyses were performed. However, it should be acknowledged, as previously mentioned (page 150) that not all participants responded to every part of every question.

The results of the first question show that on average 39.3% students did not experience 3 out of 8 experiences that were listed in the question in 1st/2nd year. Unsurprisingly, the largest proportion, 26.7% of those that did not experience "being a mentee" within the university system were 5th years. This may have been because this system was introduced in September 2013 when they had already started 5th year and therefore would not have been allocated a mentor as they are at the top of the medical school hierarchy. An average of 40% students also did not experience either having a mentor or being a mentee allocated by the previous student society mentoring system. Extra-curricular teaching and having a hospital partner in the 2nd year were rated as "useful" whereas PBL (43.1%) was ranked as slightly lower for "quite useful". The largest portion of those that did find PBL "quite useful" were 2nd years. UCCT and teaching from 4th years were ranked "very useful". A small percentage of students did not experience either PBL (3.5%), UCCT (3.5%) or have a hospital partner (6.6%).

Table 8. Statistical breakdown of most common answers of Q1 'How did you find your experiences of PAL in 1st and 2nd year?'

		%	Most common answer *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*	>Frequent year		%
University Mentor system 'Being a mentee'	243/622	39	Did Not Have Experience	5th	65/243	26.7
Being a Y2 buddy – LMSS mentors	231/628	36.8	Did Not Have Experience	3rd + 4th	58/231	25.1
LMSS mentors – Having a Y2" buddy	264/624	42.3	Did Not Have Experience	2nd	72/264	27.0
Extra-curricular teaching i.e. from sports clubs/friends	170/633	26.9	Useful	2nd	49/170	28.8
PBL	271/629	43.1	Quite Useful	2nd	81/271	29.9
UCCT	356/634	56.2	Very Useful	3rd	112/356	31.5
Hospital Partners (in Y2)	203/633	32.1	Useful	3rd	62/203	30.5
Teaching from 4th year 'hospital mentors' (in Y2)	221/630	35.1	Very Useful	3rd	80/221	36.2

Table 9. Numerical breakdown of results of Q2 'How did you find your experiences of PAL in 3rd year?'

	Very useful	Useful	Quite useful	Not useful	Did Not Have This experience	Total
University Mentor system 'Being a mentor'	2.5% 12	11.0% 52	14.8% 70	27.4% 130	44.3% 210	474
University Mentor system 'Being a mentee'	1.7% 8	8.2% 38	12.4% 58	28.5% 133	49.151% 229	466
Being a Y2 buddy – LMSS mentors	6.9% 33	13.5% 65	11.4% 55	18.3% 88	49.9% 240	481
LMSS mentors – Having a Y2" buddy	6.7% 32	13.7% 66	9.8% 47	18.7% 90	51.1% 246	481
Extra-curricular teaching i.e. from sports clubs/friends	23.8% 115	22.8% 110	17.0% 82	8.3% 40	28.2% 136	483
PBL	6.8% 33	32.4% 157	35.5% 172	21.7% 105	3.5% 17	484
UCCT	54.2% 262	25.5% 123	12.4% 60	3.5% 17	4.3% 21	483
Hospital Partners	19.4% 94	37.1% 180	26.0% 126	9.9% 48	7.6% 37	485

Table 9 shows the results for the students' responses' to experiences of PAL in 3rd year.

There were 8 experiences of which they graded on a Likert scale from "very useful" to "did

not have this experience". The majority of students did not experience either side of either

mentoring system, approximately 50%. Also 28.2% did not experience any extra-curricular

teaching. However, 23.88% of the students that did experience it rated it as "very useful".

Table 10. Statistical breakdown of most common answers of Q2 'How did you find your experiences of PAL in 3rd year?'

		%	Most common answer *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*	>Frequent year		%
University Mentor system 'Being a mentor'	210/474	44	Did Not Have This Experience	5th	78/210	37.1
University Mentor system 'Being a mentee'	229/466	49	Did Not Have This Experience	5th	81/229	35.4
Being a Y2 buddy – LMSS mentors	240/481	49.9	Did Not Have This Experience	3rd	88/240	36.6
LMSS mentors – Having a Y2" buddy	246/481	51.1	Did Not Have This Experience	3rd	91/246	36.9
Extra-curricular teaching i.e. from sports clubs/friends	136/483	28.2	Did Not Have This Experience	3rd	56/136	41.2
PBL	172/484	35.5	Quite Useful	3rd	73/172	42.4
UCCT	262/483	54.2	Very Useful	3rd	124/262	47.3
Hospital Partners	180/485	37.1	Useful	3rd	82/180	45.6

Table 11. Numerical breakdown of results of Q3 'How did you find your experiences of PAL in 4th year?'

	Very useful	Useful	Quite useful	Not useful	Did Not Have This experience	Total
University Mentor system 'Being a mentor'	2.4% 7	8.4% 24	10.8% 31	23.7% 68	54.7% 157	287
University Mentor system 'Being a mentee'	2.1% 6	5.9% 17	9.1% 26	23.1% 66	59.8% 171	286
Being a Y2 buddy – LMSS mentors	5.9% 79	8.0% 23	4.9% 14	20.2% 58	61.0% 175	287
LMSS mentors – Having a Y2" buddy	4.9% 14	8.0% 23	7.3% 21	20.6% 59	59.2% 170	287
Extra-curricular teaching i.e. from sports clubs/friends	23.5% 69	20.5% 60	14.3% 42	11.6% 34	30.0% 88	293
PBL	9.9% 29	25.3% 74	31.8% 93	30.5% 89	2.4% 7	292
UCCT	67.8% 198	18.8% 55	9.6% 28	2.4% 7	1.4% 4	292
Hospital Partners	32.5% 94	31.8% 92	19.0% 55	13.1% 38	3.5% 10	289
Being a 4th year hospital mentor	17.0% 49	13.1% 38	10.0% 29	11.4% 33	48.4% 140	289
LOCAS	36.8% 106	33.0% 95	16.0% 46	2.80% 8	11.5% 33	288

The results of 'Experiences of PAL in 4th year' show that there were greater than 50% of students did not experience 6 out of 10 experiences that were available in 4th year. These 6 included both 'mentor' and 'mentee' perspectives of each mentoring system, being a 4th year mentor within the hospital placements and teaching from acquaintances from extra-curricular activities.

Table 12. Statistical breakdown of most common answers of Q3 'How did you find your experiences of PAL in 4th year?'

		%	Most common answer *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*	>Frequent year		%
University Mentor system 'Being a mentor'	157/287	54.7	Did Not Have This Experience	5th	75/157	47.8
University Mentor system 'Being a mentee'	171/286	59.8	Did Not Have This Experience	5th	80/171	46.8
Being a Y2 buddy – LMSS mentors	175/287	60.9	Did Not Have This Experience	5th	83/175	47.4
LMSS mentors – Having a Y2" buddy	170/287	59.2	Did Not Have This Experience	5th	77/170	45.2
Extra-curricular teaching i.e. from sports clubs/friends	88/293	30.0	Did Not Have This Experience	4th	40/88	45.5
PBL	93/292	31.8	Quite Useful	4th	42/93	45.2
UCCT	198/292	67.8	Very Useful	4th	106/198	53.5
Hospital partners	94/289	32.5	Very Useful	4th	44/94	46.8
Being 4th year mentor	140/289	48.4	Did Not Have This Experience	4th	58/140	41.4
LOCAS	106/288	36.8	Very Useful	5th	48/106	45.2

Table 13. Numerical breakdown of results of Q4 'How did you find your experiences of PAL in 5th year?'

	Very useful	Useful	Quite useful	Not useful	Did Not Have This experience	Total
University Mentor system 'Being a mentor'	3.4% 4	9.5% 11	10.3% 12	31.9% 37	44.8% 52	116
Being a Y2 buddy – LMSS mentors	5.1% 6	1.7% 2	6.8% 8	23.1% 27	63.2% 74	117
LMSS mentors – Having a Y2" buddy	5.1% 6	1.7% 2	5.8% 7	23.1% 27	64.1% 75	117
Extra-curricular teaching i.e. from sports clubs/friends	17.8% 21	10.2% 12	16.9% 20	8.5% 10	46.6% 55	118
Taking a PBL group (supervising)	3.4% 4	3.4% 4	4.3% 5	0.9% 1	88.0% 103	117
UCCT	31.0% 36	31.9% 37	16.4% 19	6.9% 8	13.8% 16	116
Teaching students in hospital	28.0% 33	28.8% 34	18.6% 22	0.8% 1	23.7% 28	118
FY1 shadowing	68.6% 81	16.1% 19	4.2% 5	0.00% 0	11.0% 13	118

The majority (88%) of the 5th years had not experienced the opportunity to facilitate a PBL group. Conversely, approximately 70% of 5th year students found FY1 shadowing to be a 'very useful' form of PAL.

Table 14. Statistical breakdown of most common answers of Q4 'How did you find your experiences of PAL in 5th year?'

		%	Most common answer *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*
University Mentor system 'Being a mentor'	52/116	44.8	Did Not Have This Experience
Being a Y2 buddy – LMSS mentors	74/117	63.2	Did Not Have This Experience
LMSS mentors – Having a Y2" buddy	75/117	64.1	Did Not Have This Experience
Extra-curricular teaching i.e. from sports clubs/friends	55/118	46.6	Did Not Have This Experience
Taking a PBL group (supervising)	103/117	88.0	Did Not Have This Experience
UCCT	37/116	31.8	Useful
Teaching students in hospital	34/118	28.8	Useful
FY1 shadowing	81/118	68.6	Very Useful

Table 15. Numerical breakdown of results of Q6 'How important do you feel the following suggestions for improving PAL would be to you?'

	Very important	Fairly important	Less important	Not important	Total
Implement a reward/incentive scheme for people interested in teaching i.e. certificate for portfolios	45.7% 313	43.2% 296	7.7% 53	3.4% 23	685
Universal sharing of resources across the years i.e. Dropbox	67.2% 458	27.6% 188	4.4% 30	0.9% 6	682
Given time within schedules to meet mentors for allocated teaching	39.5% 268	39.8% 270	18.1% 123	2.5% 17	678
5th years/intercalators to be involve with teaching 1st/2nd years Basic Sciences	54.7% 373	31.5% 215	10.7% 73	3.1% 21	682
Include ward time in hospital with 4th/5th years	53.8% 366	34.0% 231	10.0% 68	2.2% 15	680
Standardise PAL within hospitals across trusts	45.5% 309	37.6% 255	14.0% 95	2.9% 20	679
Having PAL/teaching as part of 5th year portfolio	46.9% 314	38.2% 256	10.7% 72	4.2% 28	670
Encourage hospitals to have better group study space	48.5% 330	39.4% 268	9.9% 67	2.2% 15	680

Table 15 shows the results of question 6, where the students positioned suggestions for improvements within the curriculum on a scale from "very important" to "not important". All 8 suggestions were ranked "very important" with the exception of allocating time within university schedules for protected PAL teaching time which was ranked as one degree lower as "fairly important". Less than 1% students did not think "universal sharing of resources" was important at all. Having teaching as part of the 5th portfolio gained 4.2% students voting it as "not important" however this was the highest percentage from all suggestions that was not important. All values for "not important" were below 4.2%.

Table 16. Statistical breakdown of most common answers of Q6 'How important do you feel the following suggestions for improving PAL would be to you?'

		%	Most common answer *Very important-Fairly important-Less important-Not important*	>Frequent year		%
Implement a reward/incentive scheme for people interested in teaching i.e. certificate for portfolios	313/685	45.7	Very Important	3rd	97/313	30.9
Universal sharing of resources across the years i.e. Dropbox	458/682	67.2	Very Important	3rd	153/458	33.4
Given time within schedules to meet mentors for allocated teaching	270/678	39.8	Fairly Important	3rd	86/270	31.9
5th years/intercalators to be involve with teaching 1st/2nd years Basic Sciences	373/682	54.7	Very Important	2nd	112/373	30.0
Include ward time in hospital with 4th/5th years	366/680	53.8	Very Important	2nd	104/366	28.4
Standardise PAL within hospitals across trusts	309/679	45.5	Very Important	2nd	84/309	27.2
Having PAL/teaching as part of 5th year portfolio	314/670	46.9	Very Important	3rd	80/314	25.5
Encourage hospitals to have better group study space	330/680	48.5	Very Important	3rd	89/330	27.0

Table 17. Numerical breakdown of results of Q8 'Would PAL training be beneficial?'

	%	
Yes	64.56%	439
No	35.44%	241

Table 17 illustrates that 64.56% students thought that training for Peer Assisted Learning would be beneficial opposed to 35.44% that did not.

Table 18. Numerical breakdown of results of Q9 'In what form do you think PAL training should be given?'

	%	
Lecture	27.77%	158
Series of small group discussions	65.91%	375
One –one teaching	22.67%	129
Interactive course	44.29%	252
Online peer forum discussion	7.03%	40

The results for this question could be considered slightly biased as the question required students to select all answers they felt applicable without limiting the response to one. However, the results show that the overwhelming majority of students would prefer, were there a training programme in place, to be taught in a series of small group discussions or interactive courses. The suggestion of online discussion received less than 10% at 7.03%.

Table 19. Numerical breakdown of results of Q10 'How much of an impact do you feel that the following barriers have in relation to PAL?'

	Major barrier	Barrier	Minor barrier	Not a barrier	Total
Relying on someone else's' knowledge	16.5% 112	43.9% 298	34.0% 231	5.6% 38	679
Lack of enthusiasm	44.8% 304	39.2% 266	12.5% 85	3.5% 24	679
Policing quality of teaching is hard	25.7% 174	48.7% 330	22.0% 149	3.5% 24	677
'Showing off' – using obscure depth of knowledge that is not conducive	27.6% 186	34.4% 232	31.4% 212	6.7% 45	675
Having a disinterested group of students being taught	32.7% 222	43.8% 297	17.4% 118	6.0% 41	678
Time constraints	28.8% 195	45.6% 308	21.6% 146	4.0% 27	676

The above barriers listed within this question were ranked on a Likert scale of "major barrier" to "not a barrier". The results show that more than 40% of students perceived all the above propositions as barriers to PAL, however lack of enthusiasm was a "major barrier" at 44.8% students feeling this way inclined. In general, it appears that the students are least concerned about the barrier they perceive as 'showing off' where other students use knowledge to belittle others. Although 34.4% thought it was a barrier this category had the lowest percentage being a 'barrier' of all the categories, with 31.4% perceiving it as only a "minor barrier".

Table 20. Statistical breakdown of most common answers of Q10 'How much of an impact do you feel that the following barriers have in relation to PAL?'

		%	**Most common answer** *Major barrier – Barrier –Minor barrier – Not a barrier*	**>Frequent year**		%
Relying on someone else's' knowledge	298/679	43.9	Barrier	3rd	84/298	28.1
Lack of enthusiasm	304/679	44.8	Major Barrier	3rd	93/304	30.6
Policing quality of teaching is hard	330/677	48.7	Barrier	3rd	94/330	28.5
'Showing off' – using obscure depth of knowledge that is not conducive	232/675	34.4	Barrier	3rd	60/232	25.9
Having a disinterested group of students being taught	297/678	43.8	Barrier	3rd	94/297	31.6
Time constraints	308/676	45.6	Barrier	3rd	94/308	30.5

Table 21. Numerical breakdown of results of Q12 'To what extent do you agree or disagree that PAL encourages the development of the following attributes?'

	Strongly agree	Agree	Neither agree/disagree	Disagree	Strongly disagree	Total
PAL	32.3% 211	50.8% 332	15.4% 101	1.4% 9	0.2% 1	654
Teamwork	19.1% 128	55.2% 369	21.5% 144	3.6% 24	0.6% 4	669
Communication	34.2% 227	54.5% 362	9.8% 65	1.2% 8	0.30% 2	664
Reciprocal benefit for teacher and student	35.7% 238	49.5% 330	12.5% 83	1.8% 12	0.5% 3	666
Ability to present in front of your peers	36.5% 242	50.5% 335	10.7% 71	2.0% 13	0.30% 2	663

Table 21 demonstrates that over 50% of students in nearly every category agreed that each attribute was encouraged in the use of PAL. The reciprocal benefit for both students and teacher was just shy at 49.5% agreeing; however 35.7% strongly agreed that this was fortified during this process. A sizeable proportion of students did "strongly agree" that PAL (32.3%), communication (34.2%) and the ability to present in front of your peers (36.5%) were all strengthened by methods of PAL. Teamwork was the attribute with the highest percentage agreeing at 55.2%. An average of 13.9% students neither agreed nor disagreed with the above statements. Less than 3.6% students disagreed with any of the above statements whilst less than 0.60% people strongly disagreed.

Table 22. Statistical breakdown of most common answers of Q12 'To what extent do you agree or disagree that PAL encourages the development of the following attributes?'

		%	Most common answer *Strongly agree-Agree-Neither agree/disagree-Disagree-Strongly disagree*	>Frequent year		%
PAL	332/654	50.8	Agree	3rd	101/332	30.4
Teamwork	369/669	55.2	Agree	3rd	105/369	28.5
Communication	362/664	54.5	Agree	3rd	115/362	31.8
Reciprocal benefit for teacher and student	330/666	49.5	Agree	2nd +3rd	96/330	29.1
Ability to present in front of your peers	335/663	50.5	Agree	3rd	109/335	32.5

Table 23. Numerical breakdown of results of Q13 'To what extent do you agree or disagree that PBL in the current curriculum encourages PAL in the following areas?'

	Strongly agree	Agree	Neither agree/disagree	Disagree	Strongly disagree	Total
Learning	15.0% 100	52.5% 351	18.7% 125	10.6% 71	3.1% 21	668
Teamwork	12.0% 80	49.5% 330	24.7% 165	11.1% 74	2.7% 18	667
Communication	18.0% 120	57.3% 383	16.8% 112	6.0% 40	1.9% 13	668
Reciprocal benefit for teacher and student	11.6% 77	37.2% 248	26.9% 179	19.5% 130	4.8% 32	666
Ability to present in front of your peers	18.0% 126	52.9% 353	18.0% 120	8.4% 56	1.8% 12	667

The attributes for this question were identical to the previous question bar one where PAL is replaced with 'Learning'. Here, the difference was whether PBL encouraged these attributes using PAL. Again, the vast response was that the students agreed with all of the above attributes. Less than 4.8% strongly disagreed with all statements and there was an average of 21% students that could not decide and neither agreed/disagreed with the statements above. However, in this question, 57.3% students agreed with "communication" being encouraged, a rise of 3% from the previous question.

Table 24. Statistical breakdown of most common answers of Q13 'To what extent do you agree or disagree that PBL in the current curriculum encourages PAL in the following areas?'

		%	Most common answer *Strongly agree-Agree-Neither agree/disagree-Disagree-Strongly disagree*	>Frequent year		%
Learning	351/668	52.5	Agree	3rd	107/351	30.5
Teamwork	330/667	49.5	Agree	3rd	108/330	32.7
Communication	383/668	57.3	Agree	3rd	129/383	33.7
Reciprocal benefit for teacher and student	248/666	37.2	Agree	3rd	82/248	33.1
Ability to present in front of your peers	353/667	52.9	Agree	3rd	122/353	34.6

Table 25. Numerical breakdown of results of Q15 'Do you use the following social media for PAL?'

	Yes	No	Total
FaceBook	67.5% 448	32.5% 216	664
Twitter	3.6% 22	96.4% 589	611
DropBox	67.0% 440	33.0% 217	657
YouTube	57.1% 369	42.9% 277	646
Skype	7.2% 44	92.8% 568	612

The students regularly referred to social media sites such as FaceBook or DropBox within all

the nominal and focus group discussions and when asked which sites they used in relation to

PAL the most used FaceBook, DropBox and YouTube in that order of importance. Only

3.6% students used Twitter and 7.2% used Skype.

Table 26. Statistical breakdown of most common answers of Q15 'Do you use the following social media for PAL?'

		%	**Most common answer** *Yes-No*	**>Frequent year**		**%**
FaceBook	448/664	67.4	Yes	3rd	150/448	33.5
Twitter	589/611	96.4	No	3rd	168/589	28.5
DropBox	440/657	66.9	Yes	3rd	165/440	37.5
YouTube	369/646	57.1	Yes	3rd	114/369	30.9
Skype	568/612	92.8	No	3rd	161/568	28.3

Table 27. Numerical breakdown of results of Q17 'Which of the following do you use Social Media such as FaceBook, Twitter, DropBox, YouTube or Skype for?'

	%	
Peer Support	45.85	287
Group discussion	62.30	390
Sharing resources	88.18	552
Peer resources from other universities	31.63	198
Videos	58.47	366
Video lectures	55.91	350
Podcasts	30.35	190

Again, within this question the participants were allowed to select all answers they felt applicable therefore the data may be biased. However, a clear majority of 88.18% students used social media for sharing resources and 62.3% students using it for group discussion. The lowest use of social media was for usage of podcast. It is important to remember that for this question the students were asked to select all options that they deemed applicable.

Qualitative responses of the questionnaire

The questionnaire was not only a quantitative method of data collection but also had sections of qualitative data. Each of the following questions was related to a previous quantitative question. They were used to allow the respondents to have an opportunity to expand on any themes they felt relevant to the question using free text. For example, the first four questions were concerning experiences of PAL in each year of medical school. Question 5 (below) is used to ascertain any students that had PAL experiences, not mentioned before and allowed them to clarify their opinions. The data shown below was analysed using the same method as the focus groups, the Framework Approach (CF Chapter 2).

Q5 'Have you had any other experiences of PAL in any year?'

One hundred and eighty two students (25.7%) answered this question regarding additional PAL experiences that had not been previously mentioned in the first four questions.

Two students mentioned experiences of Peer Assisted Learning that were outside of the curriculum and their time in a five year medical programme – one was prior to admission, advice on entrance into university and the other experience was from a graduate entry student using experience from her previous degree.

'6th form – had friends in 1st Year who offered me advice on entrance to university'

'Previous degree – Manchester's Peer Assisted Study Scheme – PASS'

A portion of students identified schemes that they had either themselves established within their trusts or had received teaching from. These trusts were Blackpool Victoria Hospital, Royal Liverpool University Hospital, Aintree University Hospital, and Countess of Chester Hospital. Another recurrent theme was a recent programme, Gradvice, that has been founded by current third year graduate entry students. They have begun to provide teaching sessions this academic year 2013-14 for their fellow graduate colleagues. Foundation doctors and registrars are invited by Gradvice to prepare weekly teaching sessions on topics that the students choose and all graduate entry students are welcome to attend.

'In fourth year at Chester we organised case presentations within out 4th year group that were placed there. It was extremely useful and we did it once a week with different topics.'

'I have carried out group teaching sessions to friends in lower years which has been useful. Also taught in the Royal who gave lots of teaching opportunities for 5th years. Examining OSCEs was also very useful'

'Blackpool has a good 'family system' i.e. F2s are grandparents, F1 parents, 5th year older siblings and 4th year babies. A number of each in each family and it works around the needs of the group'

'A friend and I have set up a peer-peer teaching society for graduate medical students, every week between 15-30 students attend additional sessions taught by 4th/5th years or F1/2/3s on topics that are in line with their PBLs. We have also attended all the sessions and have had great feedback from everyone involved. We think a structured peer-peer teaching in and outside the curriculum is an essential part of the curriculum change!'

'Grad mentor/mentee scheme – really useful'

'Me and friend ran a series of finals revision lectures at Chester hospital where we or other students would present topics – was useful and fun!'

'RLUH last academic year had a PAL system organised by 4th year'

'The current graduate medical students in the year above have set up weekly teaching sessions for us from 5th years which have been fantastic- they call it Gradvice.'

''4th to 2nd year teach programme, run and organised by students in RLUH'

'Gradvice organised by two graduate medical students in 3rd year'

'2nd year rep set up teaching from 3rd and 4th years based at university, very helpful and useful for revision'

'Older years available in clinical skills sessions (Year 3 revision sessions)'

'Towards 2nd half of the year our year rep organised many weekly teaching sessions from older years held in different buildings across campus, focusing on core cases covered in second year. Extremely helpful'

'Teaching arranged by Year Reps in run up to 2nd year exams, OSCE practice arranged by Year 3 Reps before formatives'

'In 2nd year teaching sessions were organised where the 4th/5th years would teach the 2nd year. Very useful'

A significant amount of students acknowledged that the new mentoring system introduced in September 2013 was pioneered to promote a more justified and fair system. However, they were disenchanted when it became clear that despite their best efforts they were not contacted by their allocated mentor or were in fact ignored by their respective mentees. Ten students mentioned that they either had not been given a university mentor or mentee for reasons they were unaware of and many that had mentees were not actually given the opportunity to teach, despite them being keen, because the other party was not interested. Some of the participants within their statements specified that they were still in contact with their mentors from previous student society programme.

'I have not been given an official mentor – LMSS mentor has been brilliant!'

'I have not been assigned a university mentee/mentor however LMSS mentor system has worked well with me as still in contact with them'

'Became an unofficial mentor which was very useful; - my university mentee does not need me'

'Still in contact with mentee I was assigned by the LMSS – I tried to contact my mentee assigned by the university but to no avail'

'My peer mentor assigned by the university never contacted me or replies to my emails'

'The 'official' mentor we were allocated by email never contacted me'

'I was allocated two mentees in 2nd and 3rd year whilst in 5th year but they did not want any help/know what the system was about'

One student disagreed with the programme and the random assignment of students on the principles of students not being 'socially' matched and therefore unable to work together.

'The random nature of assigning people to each other doesn't work. People are put off by the mentoring system this way as they find that unfortunately matched up mentors and mentees are very different people and do not get on socially together. The previous LMSS mentor system that was scrapped without proper student consultation ensured that mentors and mentees could get on socially and then work academically together. This was far more successful and my experience has been that people used the mentoring system a lot more.'

There was some criticism from the previous LMSS system – particularly on the inclusion/exclusion side of the society. They complained that those that did not conform to the societies' traditions were sometimes side-lined in the mentoring system.

'I have a mentor who I met through one of the curriculum review meetings rather than LMSS or the university scheme and she is really helpful. I also have 2 mentees/buddys who are mature students (like myself) and chose not to be a part of LMSS system because of the way it is done but we as mature students are beginning to try and arrange a mentoring system'

'I asked somebody to mentor me in Year 1 as the LMSS assigned mentor only cared about getting us drunk and not helping us in any other way'

Numerous students re-iterated how useful it was to receive teaching from older years that they had met informally through extra-curricular activities, echoing the questions 1-4 in the questionnaire.

'Older friends teach us'

'From older years I know'

'Informal teachings to second and third years in my own time since my designated mentees are very independent'

'Friends who are doctors I made in groups outside of hospital. Best teaching I had was teaching organised by our 2nd year rep where we were taught by 4th years'

'Last year our PBL group ran extra revision sessions together, where we just went over topic everyone found difficult. Useful and nice way to learn'

'With housemates also leading to finals in 4th year'

Generally, the relationship of teaching between the hierarchies of the medical school from 5th years down to 2nd years seems to have translated reasonably well with many students commenting on these experiences.

'Teaching by 5th years in 4th years – good LOCAS and exam preparation'

'Teaching 2nd years in 4th year'

'5th year teaching in 4th year'

'Organised teaching session by older students – useful'

'In 2nd year 2 Aintree 5th years mentored me and my hospital partner'

'4th year – small group teaching from 5th years was useful'

Two students seemed to have extrapolated the skills learnt in PAL sessions and used it within their intercalated degrees as a chosen method of teaching and learning.

'During intercalation degree PAL has proved to be very effective.'

'Informal study groups during intercalation year'

Students also have taken PAL into their own teaching methods – often using their own initiative with friendship groups or PBL groups to go over topics they found difficult.

'In friendship group we do mini teaching sessions in cedar house, much more useful as you feel confident in asking questions'

It was interesting to note that many of the 4th/5th years felt that the FY1 doctors were an invaluable source of information and they counted them as 'peers' though they are technically in slightly different stages themselves – having graduated and started clinical jobs. In view of this, many of these students that had a good experience are emulating that role in teaching younger years.

'Foot – FY1 tutor for LOCAS, very useful'

'F1/2 buddy in 5th year – extremely useful. I am teaching PP to second years for 2 years now'

'Teaching from F1 doctors whilst in 4th year has been absolutely invaluable'

'F1 organised their own teaching sessions'

'Becoming friendly with junior doctors who then offer teaching'

'Organised to receive teaching sessions from F1s on regular basis in 4th year.'

From a teaching perspective many of the participants agreed with the experiences listed previously in the questionnaire such as teaching 2nd years in 4th year and also mentoring within hospital.

'Hospital/year reps from younger years asking for teaching sessions – useful as makes you learn things well to teach'

'Gave some teaching in clinical skills to 1st years – well received'

'Teaching by mentor is the most useful and their OSCE practice'

One student had a very strong opinion about the reasons why PBL was not a good learning method as he felt that because of the peer environment people were actually less confident in challenging the knowledge base of other students, opposing the view that students were generally more comfortable with their peers. However this was a minority opinion with only one student from the whole study population maintaining this position and must be seen as an extreme comment.

'PBL is useless as no one is prepared to call each other out if things are wrong as they don't want to appear to be man and also we have no idea how much depth to go into'

Q7 'Are there any other ways you can think of to improve PAL in the curriculum?'

There was a satisfactory response to this question with 135 students with suggestions of improvements of PAL in the current curriculum. Many of the students sought more opportunities to implement Peer Assisted Learning in order to give them more prospective occasions to utilise these skills.

'More PAL'

'More teaching this way in clinical skills'

'More opportunities'

'Any basic science teaching would be much appreciated'

Three students asked for more teaching in the form of the University Clinical Community Teaching (UCCT) sessions.

'More UCCT teaching and upper year teaching'

A few students commented on the suggestions given to them in the questionnaire about improvements that were taken from the focus groups and extrapolated slightly further.

The majority of the study population agreed that an incentive scheme would be good motivation to teach other students however on one hand some students argued that the incentive should be enlarged to be of greater value than a certificate – some argued that an incentive that was too

valuable would encourage people to attend these sessions for the wrong reasons and undermine the system. Many of the 5[th] years taking the questionnaire had not had the experience of taking a PBL group however it has been shown by those that had this experience that they felt it was hugely beneficial. The financial ruminations however of taking a PBL group in comparison to those non-clinical staff that also facilitate PBL struck a chord with the students.

'Better incentives. Encourage older years to get involved in PAL by the university rather than LMSS. Even though LMSS teaching that is put on is helpful to many it is less impressive for the CV whereas running a PBL group will look more impressive but is not encouraged by the university. Those who are running them have to seek out who to contact in order to ask to do it. Also it is not paid. Ridiculous when literally half the PBL supervisors aren't clinical but get paid for it.'

'Certificates for portfolios are not a real incentive. Make it worthwhile by providing wither minor financial incentives or benefits (access to concert tickets, cinema tickets something much more tangible than CV boosting'

'Try to make it more obligatory/more incentive to do it otherwise some mentors are far better than others'

One student believed that the universal sharing of resources should not only cover lectures and topics for sessions but should also contain an explanation of how to best to teach each session compared to each topic i.e. small group discussion/quiz attached to aid this discussion. The guidance provided would improve the quality of each session.

'Rather than just universal sharing of resources, a repository of the topics covered during PAL sessions and how these were approached i.e. through small groups, going through exam questions, at bedside. This would enable sharing of ideas for people wishing to do PAL but knowing how to plan the session or what exactly they should consider covering'

A wide variety of explanations by the students supporting conflicting views made it difficult to assume an overriding view however the slightly domineering view within this question was to keep the programme voluntary or to choose those that are genuinely interested rather than those that are CV chasing.

Allowing those that are not interested in teaching other students in an enthusiastic and supportive manner through satisfactory engagement levels and educational stimulation should not be allowed to teach other students. They feel that a mandatory system would produce a mediocre level of education in comparison to a potential service from students that are genuinely keen.

'Don't make the programme compulsory because those who do not wish to be mentors do not help or get in contact with their mentees so some people end up not receiving any help from their allocated mentors. Instead, create an opportunity where those who wish to be mentors sign up and are given guidelines on what it means to be a mentor and they can decide whether or not they will be equipped to provide this.'

'Let it be voluntary and don't force it on people'

'Non-compulsory and not to have such a large incentive for teaching that people partake for the wrong reasons!'

'Allow Drs to teach what they think is relevant. Drop objective setting in PBL – give multiple scenarios each one building on previous sessions – new knowledge of subject if people feel they need it – don't make it compulsory'

'Only those that want to teach/get involved in PAL should – don't just rope in all the 4th/5th years because not everyone is keen'

'Make voluntary – make sure only entrusted ones take part because 5th year did not contact me nor did my 2nd year reply so this takes away opportunities from those are actually interested'

'Identify people who are interested in academic F1 posts and get them involved in teaching more. I think clinical skills would be better taught by 5th years who wanted to do it!'

'Recruit people into teaching who actually want to teach as opposed to those who are there to supplement CV'

The students would prefer the programme to be compulsory in terms of a teaching portfolio that would be monitored by faculty to ensure the 'level playing field' mentality. Additional structure along with the programme would ensure guaranteed growth in personal development as 'teachers' as well as certain improvement in skills. Students want recognition for their efforts, whether it is in a portfolio that would contribute to their Curriculum Vitae (CV) or certificate format. If it is possible to receive acknowledgement for their achievements, either through the

university or nationally for example, supplementing their FPAS applications, the students

perceive that there will be a rise in conformity. It is an additional incentive.

'Make it compulsory! But still include certificates'

'Make people more aware of this, and make it something that is compulsory as to make sure some people are not left out with other not wanting to teach or be taught'

'Make a teaching requirement of the course i.e. needs to be signed off with feedback from students in the portfolio'

'Identify those students who are willing to participate /give PAL and utilise them. I believe that there are a large number of students who would teach if a structure was in place to facilitate them'

'Not all students are interested in teachings so many not put effort in which is unfair for the students they are teaching'

An idealistic mentoring system was a contentious subject in which there were many variables to

consider. The students wondered if there was a formal way for students to meet mentors in a

way that they were reassured that faculty had endorsed the system and would make them feel

secure in the knowledge that these students who had attended were actually keen to help them

through medical school.

'Mentor mentee greet event'

'Organise the opportunity to meet mentors'

'Introduce each other in a relaxed setting not through emails – my university mentee doesn't reply to any emails but my LMSS mentee and I do keep in contact'

The calibre of mentees was difficult to ascertain as someone mentioned that they had been assigned a 'mentor' who was in the same year. Although they would count as peers they felt that in this case of offering academic support it would be more appropriate to allocate a student in an older year.

'Ensure we have mentees in younger year's not same year'

'Ensure mentors and mentees are placed in same hospitals'

One student did not agree with random allocation and would have liked a free reign to ascertain mentees with common interest.

'Do not randomly assign students to each other. Allow to pick of their own accord whether they want to take part and who they want to mentor them'

Students expressed concern over the protocol used to monitor a system for monitoring. In regards to the recently implemented 2013 system some students hadn't been in contact with either mentor or mentee.

As far as they knew there had been no repercussions for this lack of contact and they were sceptical that any further measures were then taken for people taking advantage of this 'loophole' by not contributing to the role as they should and providing any teaching at all.

'My university assigned peer mentor has never gotten in touch with me; I should hope that university keeps better tabs on the communication between mentor and mentee'

'Make sure people get mentors, I never received a mentor despite asking for one numerous times'

'Check that mentors are doing their job'

Two students preferred a group mentoring system partly to take the pressure off individual mentoring and partly to create a group discussion environment to foster skills such as teamwork.

'Rather than one-on-one mentoring perhaps group mentoring e.g. 4th year students teaching four 3rd years'

'A group of you in 1st year allocated not only to individuals in 2nd/3rd year but also tied to a group which would meet together to relieve intensity'

Having mentors that had a consistent knowledge base was important to many students – although there were one or two with negative experiences because of mentors without good knowledge overall this barrier was turned into an incentive by many students using it as a tool to motivate them to fully explore all aspects of topics before teaching them to others.

'Inconsistent mentor system, some great and really helpful and other were uncommunicative and made no effort'

'Peer knows topic before teaching others and state resources of where information is from'

There were two conflicting views regarding the previous mentoring system, set up by the students' society. Some were very complimentary and others felt that it was not all inclusive and had an air of exclusivity that they did not find very welcoming.

'Bring back mentor system from LMSS'

'Have an allocated mentor to 1ˢᵗ years, some students can be shy to approach LMSS and join through this'

One student was fairly adamant for changing the nature of the new mentoring system as they felt that they had fallen victim to the systems misgivings despite the new regulatory system and felt disadvantaged as they had not having been given the same opportunities as their colleagues.

'It is very subjective – depends who your hospital/4ᵗʰ year teacher is. I never had a mentor in1st year whereas a lot of colleagues did and I felt disadvantaged. The university scheme was brought in to try and regulate this but this has not been successful for me so far. Tried contacting my mentor several times never got a reply. Also, would really like to see a DropBox to share resources across all years as this means everyone has access and no one is excluded through not having things like FaceBook'

The overwhelming response from students was that standardisation was needed to make PAL a practical option. They queried one system that would work across the board from hospital trusts, mentor system, ward based teaching etc. Setting a 'gold standard' of teaching was felt to be a very important part of improving PAL within the curriculum. This would encourage more students to participate and benefit both sides.

'Standardised system so all receive teaching, shared resources'

''More standardisation of information passed down would be helpful as some students receive very little help in what can be difficult early years whereas other receive really beneficial teaching from more keen mentors. Very much luck of the draw!'

'Equality across the system, mores structure to the meeting and what the aims are'

'Standardised mentor system i.e. my mentees did not respond to my emails despite my being willing to teach. Sessions that teach students how to be a good teacher'

'Training students "how to teach". Better standardisation of teaching across hospital trusts. Planned hand-outs, exercises, teaching objectives, mini tests of observations of teaching from senior members of staff'

'Standardisation of teaching topics is key'

One student didn't agree with standardisation as the argument stands that the transition from school to university denotes that undergraduates are after all adults.

'Don't standardise it – just let us get in with what we feel we need and how we want to do it, we are adult learners!'

Whilst another student suggested selecting potential candidates to screen whether they were right for the 'role' *'Screen potential teachers to check their personality suits the role!'*

The majority of students were keen for implementation of a training programme that would not only instil confidence within the student body; having been given an equivalent amount of basic training but would contain fundamental guidance in 'how to teach'. Encouraging use of the communication skills learnt earlier in the curriculum within a different environment could be fostered here and different ways of deliverance i.e. not always using a presentation but introducing other ways of interactivity or engagement.

'PAL training and more resources'

'More formal training and introduction to teaching'

'Session teaching us how to teach – it is a skill and should be taught as communication is'

'A guide to follow for the first time i.e. how to cover topics, how big groups should be would be useful and then we could build our own style into it'

'A training course with a certificate for your portfolio'

'Make sure student doing the teaching have a good level of knowledge as well as good communication skills'

'Encourage students to do end of rotation presentation without a PowerPoint i.e. just talking'

Feedback forms that were affiliated with the university that meant they had something that carried weight in their portfolios were a popular suggestion.

'Implementing official feedback forms would be great'

Specifically as a barrier of mentoring, and indirectly a barrier of PAL, was that there was often no convenient time for both largely because of clashing timetables a suggestion for improvement would be to allocate a time in all students' timetables to give or attend scheduled teaching. Protected time would be as mandatory as other session within the timetable. Students extrapolated this idea as having set days for practising practical skills. This would make the younger students who were being taught also feel more comfortable when asking for teaching as they do not feel they were intruding on others' busy schedules.

'Having a set time encourages people to attend. They can always rearrange at their convenience'

'A set day with a mentor e.g. 5th year where you do things like histories and practical skills e.g. cannula and examinations'

'Time out to do the above'

'More of it – I feel like I am using up their time. Perhaps allocate similar learning objectives so revision of topics can overlap for them'

'Timetabled sessions to be taught in hospital e.g. 4th years teaching 2nd year mentees being standardised and promoted'

'Involvement of university schedules'

One student was concerned in particular about PAL experience in 5th year when the students are largely on their own firms.

'Fifth year can be quite daunting sometimes especially if you have a placement with no other students or fifth years on the wards so a PAL scheme for each hospital where 5th years can meet up and maybe do case presentations every couple of weeks or have a weekly discussion topic might be a good idea in order to encourage networking with other medical students. Discuss ideas on patient management and to encourage learning from peers'

Some students mentioned systems that they had experienced in certain trusts i.e. Royal Liverpool University Hospital and Aintree University Hospital. However, they failed to specify what characteristics of those systems they wanted to emulate within the curriculum in relation to PAL.

'More teaching the way they do it at Aintree'

'Student run teaching like in the Royal as it has been much more effective than university organised'

'Greater acknowledgement from ward firms that students want to teach'

'Allow students to choose their own hospital partners/groups'

The students were apprehensive at the amount of involvement the university currently has in the present PAL system so connecting what the students felt they needed, to such things as resources/timetabled sessions etc. was important to them, in particular use of university facilities for a session i.e. HARC.

'More structures and direction from faculty from early stage. 5th years should participate in regular teaching as it is almost compulsory as a doctor to teach medical student. Teaching should be high quality and effective'

'More teaching in HARC'

'Get seniors who write exams to give advice/teaching. Best experiences so far include being placed under Dr's who write neuro exams and they quiz the group and point out things they feel are important'

'Have 5th years take PBL or HARC/clinical sessions'

Older year involvement, in particular the 5th years was a popular recommendation from many. They felt that either the content was more relevant or that the 5th years could relate to them more appropriately. Subsequently, they would deliver relevant teaching using the knowledge the student learners were expected to have at that stage in the curriculum.

'Lectures from 4th years given to small groups of 2nd year – currently done out of hospital/university'

'Improving links between 4th/5th years with younger years, maybe within hospital, have allocated sessions for teaching or make it a requirement as part of the timetable'

'Get some good 5th years to put on UCCT like session to give us teaching of all the clinical basics we need to know about different systems/core cases. They know what levels we need and seem to be able to get the basics of key skills and knowledge we need for core cases across very well'

'Ensure that 5th years will have had adequate support with regards to the basic sciences themselves before it is expected that they will be able to teach younger years'

'Teaching from F1s I hospital in 4th year has been most valuable form of teaching so far'

'Lectures by 5th years – make them facilitators of PBL'

'Organised teaching sessions from students to their year below'

'Let 5th years take PBL sessions for younger years'

Online learning tools were suggested by two students however, they disagreed on the benefits and pitfalls.

'Structured online teaching as part of the interactive learning space – perhaps part of the schools' undergraduate journal'

'Take emphasis away from online and virtual learning. People learn better face-to face/one on one in my personal experience and opinion'

One student was again concerned about the direction of the curriculum and whether we would come to rely too heavily on PAL as a learning tool – becoming a disadvantage in the long run.

'Peer assessed essays is an option although in most cases you really need an experienced clinician to teach clinical medicine. I think peer assessment would be great for years 1 and 2. Beyond this stage must be careful'

<u>Q11 'Can you think of any other barriers?'</u>

The students were asked in the questionnaire whether they felt the following were barriers and if they were, to grade them on a Likert scale of "major barrier" – "not a barrier". The barriers given were; relying on others' knowledge, monitoring is hard, having disinterested students from the teaching perspective, students that used individual knowledge to "show off" and time constraints particularly within the university timetable. One hundred and nineteen students answered this additional qualitative enquiry concerning the potential impediments of PAL.

A lack of designated space to hold teaching was a problem for some students. This combined with a lack of suitable space that held appropriate resources such as whiteboard facilities and teaching implements. Cedar House – where the Medical School Office is held, is only open to the students during the week from 9-5pm and is not available during weekends.

'Space constraints and busy timetables'

'Lack of equipment needed to teach e.g. computer, whiteboard, flipchart, suitable space to sit and teach/discuss'

'Lack of spaces available and poorly equipped rooms'
'Limited spaces for teaching'

'Finding appropriate teaching rooms'

'Appropriate environment i.e. access to board'

'Organisation of teaching sessions. Lack of space for teaching – we have no student union; cedar house is busy and closes at 5. Students live far from campus and will not attend optional teaching. A Lack of consistency and continuity of teaching'

'Travelling to university – should be done in hospitals as people will already be there or make it possible to do teaching in Greenbank/Carnatic as it is easier for people to get to'

'Finding a good enough venue, wards are often ideal if quiet. Finding evening places to give lectures is difficult'

'Lack of enthusiasm show by teachers – too busy, not enough time'

Protected teaching time as well as space was also a problem with many wanting to involve the university as stated in the earlier question to renovate the timetables for allocated time or ensuring less scheduled clashes between years to allow teaching to occur.

'Busy schedules with no protected time to teach younger students'

'Disorganised teaching – a set time and place would be improvement'

'Teachers schedule clashing – therefore cancelling sessions'

'Many other competing commitments'

'Time available'

'Arranging sessions'

'Time constraints, not enough time allocated in the curriculum for teaching and to teach. Allocating time to PAL will highlight its importance then development of medical students and bring better results'

'I think the biggest barrier is time – people all have their own schedules hence why if it was mutually beneficial i.e. certificates they would be more likely to make time for it. Showing off mainly happens in CCT where students of the same grade will give too much knowledge and make you feel bad but this only happens with a certain kind of person and most are okay. In general, teaching from older years e.g. F1 up is at a much better level as they know what is expected in the exam/ Policing quality and enthusiasm is not a problem as only those who wasn't to teach will teach therefore in general enthusiasm is quite good as long as time allows'

'Older years not having time'

'Older years especially 4th years are quite busy so it is difficult to arrange times to receive teaching'

'Organising teaching times which suits both teacher and student'

Inconsistent experiences left the students wondering how they should attempt to standardise the PAL experiences between students and create a 'level playing field'.

'Grouping students together with different modes of study/not allowing choice of PAL groups. Obviously this cannot be catered to completely but sometimes it can be difficult for everyone to "gel" with others in a group and it can affect the quality of the session'

'Inconsistency in quality leads to different experiences. Some groups with good facilitator learn lots. A poor group that does not engage suffers too much'

'Most of the things we are being taught is directly from books or other sources. We learn from explanations and not copying information. Explanations rarely found to be provided by non-experts i.e. 4th years'

'Discrepancy between levels of learning, dependent on attitude of convenor'

'Irrelevant content being taught'

'Sometimes we get different people allocated who might not even turn up while your friends are getting good teaching

'Students can only give their knowledge from a students' perspective it takes someone with experience working as a clinician to truly convey the clinical importance of some information'

'Some people are good teachers and some are not. A particular case of someone wanting to teach me but when he does it is wanting to show off that he knows more and it isn't very helpful'

'Some PBL facilitators have a more relaxed attitude than others which can influence the group to perform less well'

'Quality of peer assessment is probably the biggest barrier. You want to trust your peer assessor like you want to be able to trust your doctor'

'Teaching "what you need to know for exams" rather than principles to improve understanding'

'Too many students within teaching groups, not as interactive/personalised to students needs'

'Also having students that are "too enthusiastic" that they start to disrupt other students learning in groups by asking too many questions or obscure things so they people become disinterested'

Students recognised, either within themselves or having experienced it from others that there was a lack of confidence in teaching. This could be uncertainty in the topic or their self-assuredness that they can control a group and impart knowledge in an engaging and memorable way. It could even be that they do not like speaking in front of a group of people. Should we be trying to push these people out of their comfort zone and confront these fears by nurturing?

'Lack of confidence on the part of the tutor – being required to teach areas they do not know well themselves'

'Anxiety about teaching'

'Teachers' lack of confidence/lack of knowledge on how to deliver an effective tutorial/lecture'

'Some people are terrified of public speaking'

'Having to teach thing you are not confident in'

Some students were disappointed to learn that though they were keen to teach or learn that they may have experienced mentors or mentees that were disinterested in their respective fields of being taught or teaching. This was problematic as it was discussed as a cycle where students became disengaged, in turn retaining that disheartened attitude and passing it on through the generations.

'Poor communication between mentors and mentees – uninterested mentors'

'Disinterested inaccessible mentors'

'Disinterested teachers'

'You have nothing in common with mentor'

'Inadequate knowledge in the mentor'

'Mentors never having received useful teaching on the topics they are to pass down information on'

'Sometimes a lack of shared understanding of what to learn between students'

'It works better to engage in PAL with a younger student you get on with socially, not a randomly allocated one'

'Knowing enough/having enough contact with students in different year groups'

Another matter was, having established contact, was then to remember to communicate regularly in the future.

'It is easy to become out of touch with your mentor/mentee. Maybe as stated before, implement specific times throughout the year to meet and teach pre-arranged topics. This way mentors would make sure they knew what they were talking about to avoid embarrassment and the mentee would gain the most'

'Being assigned a mentor who did not keep in touch – had I not been "adopted" by mentors who I met at extra-curricular club I would have been completely lost. The university should check with the students that they are receiving the support the need from those older years'

'Not being able to get in touch with you mentee'

Support from the Medical School was a big issue for the students. They felt a little blinded by the constant changing systems without any direction and were looking for a bit more guidance.

'Feeling unsupported by medical school. Could they provide us with resources so we at least know we are teaching ourselves and each other the right information?'

'Faculty preventing us from doing teaching. Access to clinical skills and HARC out fo hours to take teaching sessions in there'

'Strangers- no platform to meet face to face other than LMSS mentor-mentee but the university's programme doesn't have a platform but expect us to just connect like that through emails when not too many people like to reply'

'Vague learning objectives for the year prevent focused teaching'

A fifth year mentioned that having been introduced to PAL only recently he had found it difficult to assimilate it into normal practice.

'For me, PAL was introduced late (already in 5th year) so it was harder to integrate it into everyday studies'

One student said that in her experience no students that she knew would reject any form of teaching, PAL or otherwise.

'I have not met any students that are "disinterested" in being taught, most students I meet are crying out for some form of structured teaching'

Two students commented that they did not think PAL was a good method to be integrated into the curriculum as it was more of an excuse for teaching to be 'comfortable' and less productive, *'Comfort using PAL'* whilst another student said that there was no advantage to using PAL apart from it being a pleasant experience.

'There is no benefit to teaching lower years aside from it being enjoyable'

Problems occurred in hospitals that perhaps do not have any younger years below 4[th] year for example, Blackpool Victoria Hospital, Warrington & Halton's Hospital, Southport & Ormskirk Hospital and the Countess of Chester Hospital. Without these hospitals it would be impossible to accommodate the high level intensity programme needed for 4[th] year however it would also be a large task to take on as many of these students in 2[nd] year particularly as they are in general, smaller hospitals.

'Hospitals such as Blackpool do not have the opportunity to mentor younger years and get involved in teaching'

There is no official PAL system that is currently formalised within the undergraduate programme which one student has pointed out is a barrier in itself, '*It is currently optional'*. This leaves the system open to such criticism as, *'Lack of monitoring'* as there is no regulatory body to report to if there is a breakdown of communication, quality safeguarding or absence of teaching.

Other impediments included lack of structure within sessions and the exclusivity of current PAL sessions. A barrier was also the assumption that some students may be selfish in fully disclosing knowledge.

'Lack of aims – should be clear and laid out following discussion by the whole group, not just laid out by the teacher'

'Limited places for a students in teaching sessions means only a handful of students get access to certain teaching and others may miss out'

'People not wanting to disclose knowledge – keeping it to themselves'

A student remarked that the theory of using PAL in PBL was quite confusing to the younger years and should be kept as a learning tool for the older years to use once they had reached the latter clinical years.

'Using PBL earlier in the course puts people off as they don't understand it – break it down more for younger years and then more peer/facilitated in 4th/5th year'

Again, one student was emphatic about the students being consulted befor before a system similar to this could be put into place and campaigned for an opt-in system rather than a mandatory placement that could affect their degree.

'Please ask students if they wish to mentor others as some do not and get forced into it and don't help their mentees'

Forty seven students responded to this section of the questionnaire. Approximately half of the students were encouraging in their responses, advocating the improvement that PAL could make to their learning.

'PAL should be encouraged'

'It is incredibly useful when done well and should be promoted. I think its most useful when 4th and 5th years teach 2nd and 3rd years'

'The organised PAL doesn't seem to be any good but the extra sessions put on outside of university by years above and in hospitals have been excellent'

'Definitely needs to be a part'

Within the current curriculum, the students mainly recognised that Problem Based Learning facilitated PAL and there were mixed reviews about the PBL process. The main problem was making sure that everybody within the group is performing at the same level and expending equal amounts of effort to contribute to the group environment. If there are passive participants the collaborative benefit tends to be less.

'Massively dependent on who is in the PBL group – some people hate talking in groups so can make the process not work'

'PBL alone is not enough to learn medicine. A multitude of methods need to be employed in order for it to be effective. For example, related CBDs and lectures and maybe short test or exams to consolidate the required knowledge of that topic'

'Not everyone pulls their weight, especially in PBL. Lack of continuity with tutors (as a results of relying on PAL) can make you feel undervalued and that your work is unappreciated'

'It really depends in your group and how organised and enthusiastic they are '

'Not monitored well so people in PBL can get away with saying nothing (including me) which benefits nobody and we may as well just not have a session. We've all done the work and we all know it but what's the point in going in that case as nobody actually teaches anyone else what they know. It's never happened in any of my PBL groups to date – it's more like letting everyone know you've done your work rather than actually learning from each other'

'A lot of people get by in PBL without speaking and hence do not derive the same benefit'

'Not all your peers are always willing to be as involved in PAL i.e. not everyone in a PBL group will contribute in sessions'

'PBL groups always have some people who do not participate so perhaps PAL may be better for these people if it is on a 1-1 basis'

'Teamwork and ability to present in front of your peers during PBL sessions is questionable as there is always 1 or 2 in the group that chose to not contribute to speak during the sessions. Not a very effective way of learning for that person and the whole group'

'PBL in theory seems like it would help develop all of these areas, however, in reality the PBL sessions are dependent upon your group/facilitator and material is covered very superficially. Often, people feel self-conscious about speaking in front of the group so just mumble something/stay silent'

There were some students however who praised the relationship between PBL and PAL, claiming that they do work well together. Students, who seem dissatisfied with PBL, may potentially have had poor experiences, explaining their lack of confidence and engagement in the philosophy. However, conversely from these results there are a lot of students with hugely positive experiences of PBL and PAL.

'PBL is great for PAL'

'I think PBL aids PAL very well'

One student had an extreme view that they were dissatisfied with the methods of PBL and therefore PAL in which they inferred that they had received none of the perceive benefit from these tools.

'Does not work. The university promise a system of PBL that works when applying to the university. I feel I have been disadvantaged in fulfilling my academic potential and becoming

the best possible doctor by coming to Liverpool University. I feel the course lacks clarity and academic support from medical professionals and academics. We are paying thousands of pounds for a library membership!'

One student was completely disenchanted with PBL and did not agree with it at all. *'The fact that it is being phased out says it all and how counter-productive it is'*

One student stated they felt that, *'There is no PAL in the curriculum'.*

'The current PAL system is not widely used in the medical school'

Conversely, one student agreed that using the PBL process in tandem with PAL training could produce excellent benefits concurrently with structural support from the university.

'PAL + PBL would allow greater development of medical students compared to PBL alone in the curriculum as provides a structured platform to allow older years to pass on their wisdom to younger years'

The debate of whether these sorts of programmes should be compulsory or opt-in/opt-out is ongoing with some students agreeing below that it is a case of quality over quantity that they would prefer.

'It should not be enforced upon people who are not keen as they will become poor quality teachers'

'Should be focused on more – in an optional sense rather than forced upon you in PBL sessions'

'If they're going to provide teaching for PAL make it accessible but not compulsory and add another huge volume of paper to an already thick 5th year portfolio. It will remove any enthusiasm for PAL and make it a paper –pushing exercise.'

A few students identified areas of improvement or concern that had been discussed earlier in the questionnaire.

'If you get an enthusiastic mentor it makes a huge difference. My hospital mentor was great and helped me loads with building my confidence in clinical skills'

'I think policing is the biggest concern for me'

'It has to be monitored by the university or hospital to make sure correct information are delivered to students'

'Small group teaching would be better if it was more regular and the mentors had more time'

One student was less complimentary about the PAL teaching they had received in the past.

'Usually, from my experience, any PAL teaching is a regurgitation of some good teaching the student was given in a one-off hospital teaching situation'

Three students were hesitant in commending a formal integration of PAL within the curriculum because of the obstacles that would need to be overcome to ensure a just system of unequivocal equality.

'Generally a good idea but not sure about how formally it should be included in the curriculum as I think it has weaknesses as well. Faculty shouldn't use it instead of teaching from real experienced clinicians because of budget problem'

'Peer Assisted Learning is a bit of a cop out for the university, too much of it means students get unstandardized teaching from people who aren't trained to teach, and I means the university do not have to pay for clinicians/lecturers to teach us and also increases the workload for already busy students'

'I'm not sure it should be an official part of the curriculum, too many variables will not guarantee fair and equal teaching'

Q16 ' Are there any other forms of Social Media that you use?'

Sixteen students answered this section of the questionnaire with alternative forms of social media that they had used. The suggestions are listed in the table below in order of those forms with most votes to those with least votes and the table suggests how many students gave it as an answer.

Table 28. The result of Q16 'Are there any other forms of social media that you use for PAL?'

Social Media	Number of students that gave this response
WhatsApp	5
PodMedics	4
Online forums/discussion boards	3
Meducation	1
Google Hangouts	1
Medical apps i.e.anatomy/eponyms	1
Almost a Doctor	1

<u>Q17 'Which of the following do you use Social Media such as FaceBook, Twitter, DropBox,</u>

<u>YouTube or Skype for?'</u>

Nineteen students made additional comments with other activities that they use social media

for in relation to PAL. The options the students were given were:

- Peer Support

- Group discussion

- Sharing resources

- Peer resources from other universities

- Videos

- Video lectures

- Podcasts

They were then asked to comment if they used social media for any other purposes than the

ones listed above. The majority of students used it for organising of teaching sessions or peer

support.

Two students mentioned the importance of the support they had received from year

representatives in using FaceBook to generate a page for the year in which they were updated

about useful teaching sessions to attend or changes to their timetables. It was noted that

although the year representative also sent the same information out via e-mail the students

were more likely to get the notification through social media site rather than the university

email system. Resource sharing through social media was also an effective tool between

those in the PBL group or teaching sessions. Lecture slides, shared after the event, were also

shared through various forms of social media.

The suggestions given below are in order of which alternatives had the most votes.

- FaceBook group organises extra lectures through graduate medics in the year above

- Lecture slides

- Powerpoints from older years

- Setting up/arranging teaching

- PDF notes

- Organising teaching sessions

- Finding out about lectures

- Peer support i.e. asking each other what we actually need to learn for each objective

- Relevant research papers

- Practice questions

- Quizzes

<u>Q18 'Do you have any further comments about PAL you wish to make?'</u>

Fifty four students made additional comments about Peer Assisted Learning at the conclusion of the questionnaire and they were encouraged to remark on anything that they felt was relevant to the topic of PAL.

Three students objected to the quality and length of the survey although it was specified that the questionnaire would take up to 15 minutes in the consent form. This may have been misleading.

'Complicated questionnaire'

'This questionnaire is quite confusing'

'This was not a short survey. Peer Assisted Learning is a fancy ideal that requires significant effort from both mentees and mentors and is difficult to get right, especially when the quality of mentors is very variable'

Some students expressed some concern over a system that could be entirely governed by PAL and whilst they agreed that it could be an effective learning tool, would like to see it used as a formalised adjunct tool to enhance skills.

'It is useful but not a main method of learning but as a supportive feature'

'Generally a good idea but not sure about how formally it should be included in the curriculum as I think it has weaknesses as well. Faculty shouldn't use it instead of teaching from real experienced clinicians because of budget problems'

A few students were still confused about the term PAL and whether it was referring to the online Vital scheme or teaching within the university.

'PAL is pretty ambiguous – is it referring to general peer assisted learning or the scheme on Vital?'

However, there were a lot of positive remarks from the students – largely supporting Pee assisted Learning and what it could potentially bring to the new curriculum if it was input formally, with structural foundations.

'If performed properly, it is the best form of learning experience for medical students by far i.e. Vs university lecture'

'I think PAL is a fantastic idea that should be fully integrated into the new curriculum'

'A more structured approach to peer assisted learning would bring more benefit to student and teacher. The current system is useful however students teach and are taught in a haphazard manner with little continuity or standardisation. Assigning a student 3 sessions to teach a topic would be a more structured approach'

'I think PAL is very important aspect of medical education. The more it can be encouraged the better. Older students also know the level of knowledge that younger students need, which helps them in their learning'

'A good resource which isn't fully utilised to its potential'

'I think it is very beneficial having a mentor to help you and replicating that help to a mentee'

'Need to encourage it as it is more useful than lectures in 1ˢᵗ year'

'Would be a really good idea if it was implemented properly within the medical school'

'Good idea, just not very well communicated what we are supposed to do'

One student suggested:

'I think mentor and mentees should be assigned meeting slots/dates to meet up together at Cedar House where the teaching can be carried out. I mention Cedar House in particular as often the 'informal' and 'casual' meeting environments for men/mentee meet-ups are not appropriate or accessible for certain students from different backgrounds. Which means that unfortunately they are missing out on a valuable teaching/learning experience. Furthermore a system like this should ensure that ALL students volunteering to participate in PAL are fulfilling their commitments and taking the mysteriously. Measure should be put in pace to ensure that these meetings take place i.e. filling out a feedback form after every session/term. I understand that this may not be realistic but I would urge you to take into consideration

that the LMSS mentor/mentee scheme is not always accessible for some students with certain beliefs – how can we tackle this?'

One student re-iterated the point that no matter how mandatory something is, having teaching from someone who is perceived as not being remotely interested in it, makes it a redundant process. Therefore they believe that it should not be a compulsory mentoring or PAL programme. This could reflect a lack of understanding of value of PAL in the student-teachers' case or a lack of training in PAL. However, if the training was to be made compulsory the content of training may change their overall perception of the value of PAL.

'Clinical teaching from 5th/4th years above in 2nd year would be fantastic and better than most normal university lectures but only those that want to do it. I think if the older years were forced to do it there would be some rubbish teaching too'

Some students had not had a positive experience with the university mentoring system because although the system should be random and all-inclusive they have been disregarded with no consequences from faculty.

'I don't agree with the university making us have a mentee. I feel guilty because my university allocated mentee doesn't respond to any emails and I feel like I'm letting her down and could get into trouble. If the university are so worried about the quality of teaching provided they should employ better lecturers who would teach people in smaller group settings so that everyone could benefit they could invite other students into these groups to add in what they leant or how they remember it'

'Got given 4th year mentor by university but have never heard from them – understand that they are busy though'

Whilst the overall impression of PAL was very positive there were certain students that expressed more sceptical opinions about the obstacles and weaknesses that would either need to be alleviated as much as possible or disengaged completely.

'Not everyone is engaging in Peer Assisted Learning meaning that some people are missing out on this supplementary teaching which is not fair'

'More teaching or at least someone knowledge in subject in PBL. No point having someone there that doesn't know anything and then you teach each other the wrong things.'

'Most sessions are as preparation for exams. I suspect it may sometimes encourage learning in superficial depth or at least strategically for the exam. Probably is a big player in the informal curriculum'

'There is a lack of awareness among students'

'Needs to be monitored properly to ensure consistency'

'Works best when not strict – casual friendship with older years works really well e.g. LMSS system – older years are generally happy to answer questions but may not have time for teaching.'

Two students proposed a strategic option for the training programme if it were implemented whilst the other suggested an online video channel for extra lectures to be recorded and stored in the same place – content to be affiliated with the university.

'Share advice on HOW to learn e.g. employ metacognitive techniques to learning i.e. quality over quantity'

'Students from older years could film the teaching that they give to students in younger years and post it on a YouTube channel – a Liverpool Medical School channel could be created for students to share lectures that they have written.'

Tables showing statistically significant differences

The tables below show the results of the T-tests performed on the quantitative and Likert scale sections of the questionnaire. Each individual year group was compared to every other year group from 2^{nd} -5^{th} years including the students currently intercalating in order to identify any trends. The presence of trends could demonstrate a causal relationship between particular responses and a specific year group which would be interesting to investigate.

Statistical significant results are those results that are highlighted in yellow and this thesis has taken the value of < 0.05 to mean statistically significant. Within some questions it was not appropriate to ask certain students their opinions. For example, it would have been inappropriate to ask the 2^{nd} year students to respond to the question regarding PAL experiences in 3^{rd} year as they would not have had those experiences yet. Therefore, in the tables below, the term "N/A – Not Applicable" has been applied in those situations.

The following figures will show the results for the statistical tests for the questions where the tests were applicable

Key 2nd = 2nd year students
3rd = 3rd year students
4th = 4th year students
I = students that intercalated
NI = students that did not intercalate
5th = 5th year students

Table 29 . Statistically significant differences for all combinations of years for question 1 of the questionnaire

	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{rd}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q1. How did you find your experience PAL in 1st/2nd year? *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*										
• University Mentor system 'Being a mentee'	0.006	0.000	0.002	0.000	0.004	0.121	0.000	0.846	0.150	0.052
• Being a Y2 buddy – LMSS mentors	0.690	0.000	0.006	0.000	0.003	0.212	0.007	0.443	0.514	0.926
• LMSS mentors – Having a Y2" buddy	0.917	0.001	0.394	0.027	0.001	0.345	0.019	0.175	0.480	0.442
• Extra-curricular teaching i.e. from sports clubs/friends	0.643	0.012	0.798	0.575	0.040	0.583	0.884	0.058	0.531	0.085
• Problem based Learning (PBL)	0.907	0.006	0.220	0.636	0.011	0.224	0.727	0.009	0.176	0.052
• University Community Clinical Teaching (UCCT)	0.665	0.103	0.001	0.000	0.260	0.006	0.000	0.078	0.897	0.019
• Hospital Partners (in Y2)	0.005	0.000	0.010	0.001	0.184	0.537	0.508	0.783	0.871	0.541
• Teaching from 4th year 'hospital mentors' (in Y2)	0.569	0.000	0.000	0.000	0.000	0.000	0.000	0.695	0.621	0.218

Key 2^{nd} = 2^{nd} year students
3^{rd} = 3^{rd} year students
4^{th} = 4^{th} year students
I = students that intercalated
NI = students that did not intercalate
5^{th} = 5^{th} year students

Table 30 . Statistically significant differences for all combinations of years for question 2 of the

	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q2. How did you find your experience PAL in 3^{rd} year? *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*						
• University Mentor system 'Being a mentor'	0.000	0.000	0.000	0.252	0.802	0.247
• University Mentor system 'Being a mentee'	0.001	0.000	0.000	0.170	0.745	0.014
• Being a Y2 buddy – LMSS mentors	0.016	0.039	0.003	0.585	0.944	0.521
• LMSS mentors – Having a Y2" buddy	0.015	0.112	0.001	0.945	0.502	0.305
• Extra-curricular teaching i.e. from sports clubs/friends	0.033	0.654	0.508	0.064	0.373	0.198
• Problem based Learning (PBL)	0.011	0.971	0.865	0.153	0.894	0.026
• University Community Clinical Teaching (UCCT)	0.476	0.040	0.022	0.011	0.609	0.004
• Hospital Partners	0.771	0.551	0.792	0.702	0.417	0.613

Table 31. Statistically significant differences for all combinations of years for question 3 of the questionnaire

Question	4th/I	5th/I	4th/5th
Q3. How did you find your experience PAL in 4th year? *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*			
• University Mentor system 'Being a mentor'	0.000	0.219	0.000
• University Mentor system 'Being a mentee'	0.000	0.233	0.000
• Being a Y2 buddy – LMSS mentors	0.875	0.623	0.380
• LMSS mentors – Having a Y2" buddy	0.819	0.250	0.065
• Extra-curricular teaching i.e. from sports clubs/friends	0.308	0.487	0.730
• Problem based Learning (PBL)	0.346	0.846	0.265
• University Community Clinical Teaching (UCCT)	0.003	0.212	0.030
• Hospital Partners	0.837	0.891	0.926
• Being a 4th year hospital mentor	0.183	0.327	0.655
• LOCAS	0.001	0.747	0.000

Key   2nd = 2nd year students
3rd = 3rd year students
4th = 4th year students
I = students that intercalated
NI = students that did not intercalate
5th = 5th year students

Table 32 . Statistically significant differences for all combinations of years for question 4 of the questionnaire

Q4. How did you find your experience PAL in 5th year? *Very useful-Useful-Quite Useful-Not Useful-Did not have this experience*	5th/I/NI
• University Mentor system 'Being a mentor'	0.285
• Being a Y2 buddy – LMSS mentors	0.631
• LMSS mentors – Having a Y2" buddy	0.636
• Extra-curricular teaching i.e. from sports clubs/friends	0.874
• Taking a PBL group (supervising)	0.114
• University Community Clinical Teaching (UCCT)	0.602
• Teaching students in hospital	0.978
• F1 shadowing	0.015

Key   2nd = 2nd year students
3rd = 3rd year students
4th = 4th year students
I = students that intercalated
NI = students that did not intercalate
5th = 5th year students

Table 33 . Statistically significant differences for all combinations of years for question 6 of the questionnaire

	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q6. Please state how important you feel the following suggestions for improving PAL would be to you. *Very important-Fairly important-Less important-Not important*										
• Implement a reward/incentive scheme for people interested in teaching i.e. certificate for portfolios	0.686	0.203	0.701	0.581	0.355	0.901	0.847	0.646	0.993	0.520
• Universal sharing of resources across the years i.e. Dropbox	0.981	0.000	0.001	0.000	0.000	0.001	0.000	0.457	0.828	0.466
• Given time within schedules to meet mentors for allocated teaching	0.000	0.302	0.870	0.213	0.000	0.004	0.000	0.614	0.504	0.791
• 5^{th} years/intercalators to be involve with teaching $1^{st}/2^{nd}$ years Basic Sciences	0.011	0.001	0.174	0.373	0.211	0.826	0.155	0.347	0.463	0.017
• Include ward time in hospital with $4^{th}/5^{th}$ years	0.004	0.273	0.000	0.471	0.140	0.047	0.001	0.006	0.000	0.100
• Standardise PAL within hospitals across trusts	0.024	0.093	0.562	0.113	0.767	0.458	0.000	0.629	0.122	0.004
• Having PAL/teaching as part of 5^{th} year portfolio	0.019	0.437	0.974	0.213	0.194	0.191	0.003	0.638	0.482	0.096
• Encourage hospitals to have better group study space	0.552	0.604	0.694	0.343	0.277	0.453	0.132	0.954	0.816	0.671

Key 2^{nd} = 2^{nd} year students
3^{rd} = 3^{rd} year students
4^{th} = 4^{th} year students
I = students that intercalated
NI = students that did not intercalate
5^{th} = 5^{th} year students

Table 34. Statistically significant differences for all combinations of years for question 8 of the questionnaire

	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q8. Would it be beneficial to have PAL training? *Yes-No*	0.075	0.173	0.468	0.001	0.789	0.074	0.000	0.119	0.107	0.000

Table 35 . Statistically significant differences for all combinations of years for question 10 of the questionnaire

	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q10. Barriers– How much of an impact do you feel that the following barriers have in relation to PAL? *Major barrier – Barrier –Minor barrier – Not a barrier*										
• Relying on someone else's' knowledge	0.093	0.520	0.010	0.007	0.380	0.150	0.224	0.061	0.501	0.057
• Lack of enthusiasm	0.001	0.005	0.290	0.000	0.994	0.360	0.199	0.422	0.090	0.261
• Policing quality of teaching is hard	0.188	0.936	0.138	0.064	0.181	0.478	0.464	0.122	0.840	0.060
• 'Showing off' – using obscure depth of knowledge that is not conducive	0.073	0.002	0.008	0.000	0.153	0.119	0.006	0.544	0.804	0.215
• Having a disinterested group of students being taught	0.162	0.000	0.440	0.000	0.021	0.959	0.000	0.144	0.018	0.242
• Time constraints	0.333	0.203	0.671	0.179	0.028	0.308	0.617	0.687	0.189	0.015

Key	
$2^{nd} = 2^{nd}$ year students	
$3^{rd} = 3^{rd}$ year students	
$4^{th} = 4^{th}$ year students	
I = students that intercalated	
NI = students that did not intercalate	
$5^{th} = 5^{th}$ year students	

Q12. To what extent do you agree or disagree that PAL encourages the development of the following attributes? *Strongly agree-Agree-Neither agree/disagree-Disagree-Strongly disagree*	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
• Peer Assisted Learning	0.175	0.192	0.010	0.194	0.894	0.002	0.015	0.004	0.113	0.026
• Teamwork	0.190	0.995	0.176	0.024	0.226	0.038	0.001	0.193	0.863	0.034
• Communication	0.740	0.842	0.003	0.009	0.607	0.001	0.002	0.006	0.142	0.024
• Reciprocal benefit for teacher and student	0.332	0.443	0.040	0.228	0.922	0.015	0.046	0.027	0.240	0.085
• Ability to present in front of your peers	0.781	0.460	0.002	0.021	0.600	0.002	0.027	0.008	0.069	0.118

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Key 2^{nd} = 2^{nd} year students
3^{rd} = 3^{rd} year students
4^{th} = 4^{th} year students
I = students that intercalated
NI = students that did not intercalate
5^{th} = 5^{th} year students

	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
Q13. To what extent do you agree or disagree that Problem Based Learning in the current curriculum encourages Peer Assisted Learning in the following areas? *Strongly agree-Agree-Neither agree/disagree-Disagree-Strongly disagree*										
• Learning	0.844	0.059	0.014	0.084	0.062	0.006	0.041	0.001	0.170	0.001
• Teamwork	0.320	0.124	0.117	0.421	0.459	0.024	0.080	0.018	0.315	0.033
• Communication	0.082	0.003	0.128	0.870	0.078	0.006	0.071	0.002	0.145	0.004
• Reciprocal benefit for teacher and student	0.420	0.234	0.076	0.436	0.038	0.137	0.949	0.014	0.171	0.088
• Ability to present in front of your peers	0.100	0.000	0.529	0.392	0.011	0.080	0.552	0.002	0.216	0.007

Table 39. Statistically significant differences for all combinations of years for question 15 of the questionnaire

Q15. Do you use the following social media for Peer Assisted Learning? *Y-N*	$2^{nd}/3^{rd}$	$2^{nd}/4^{th}$	$2^{nd}/I$	$2^{nd}/5^{th}$	$3^{rd}/4^{th}$	$3^{rd}/I$	$3^{d}/5^{th}$	$4^{th}/I$	$5^{th}/I$	$4^{th}/5^{th}$
• Yes - FaceBook	0.936	0.065	0.000	0.000	0.049	0.000	0.000	0.017	0.966	0.001
• Yes - Twitter	0.686	0.488	0.990	0.054	0.282	0.819	0.101	0.618	0.277	0.015
• Yes - DropBox	0.077	0.000	0.001	0.000	0.000	0.000	0.000	0.505	0.018	0.000
• Yes - YouTube	0.314	0.341	0.758	0.650	0.973	0.353	0.654	0.359	0.552	0.656
• Yes - Skype	0.568	0.772	0.884	0.241	0.800	0.633	0.500	0.748	0.399	0.388

Statistically significant differences

By using T-tests (CF Chapter 4) as a statistical test to analyse the results, conclusions can be drawn concerning whether an observed effect has occurred due to chance or whether a certain variable has affected the outcome. If a p-value of 0.05 (5%) has occurred, the researcher can conclude that the probability that the effect shown in the results is due to the intended selection of the sample population rather than an effect of 'chance'. Within this body of research, a p-value of 0.05 was used to mean 'statistically significant' when analysing the data.

The overall results from the questionnaire were that, primarily, the most discordant results were achieved between the 3rd years and the 5th year cohort – there were 36 instances where the results were statistically significant.

There were most similarities between the 4th year and 5th year cohorts, resulting in only 4 instances where there were statistically significant differences. This may be because of where they are in the curriculum – having most recently been in the same scenarios for example, sitting LOCAs, finals written exams and prolonged ward time in hospital.

1. How did you find your experiences of PAL in 1st/2nd year?

When talking about the experiences of PAL in 1st and 2nd year there were 7 out of 8 categories of experiences that were significant when comparing responses of 2nd/4th year cohorts. Their answers were very much different except for University Clinical Community Teaching.

Noticeably, within this question there were no statistical significant differences between 5th years and current intercalating students. There was one disagreement for both 4th years and intercalating students and between 4th years and the 5th years. Respectively they disagreed on Problem Based Learning and University Clinical Community Teaching.

Out of all the 'experiences' that the students were asked to 'grade' the most controversial experiences were University Mentor system 'being a mentee' and Teaching from 4th years within hospital in 2nd years – both receiving 6/10 combinations of statistic discrepancies. Incidentally, all 6 combinations had a result of 0.00 for teaching from 4th years.

2. How did you find your experiences of PAL in 3rd year?

As this question was regarding experiences in Year 3, here the 2nd years were excluded, narrowing the combinations of trends to 6 combinations.

Within the 9 experiences there were 6 instances, in which the 3rd/4th years disagreed most – of these experiences some were similar to those asked of them in the first question. They did however; agree on the usefulness of Hospital Partners within 3rd year and UCCT. This could be down to the psychiatric rotations in 3rd year where many students have said they feel much

more comfortable with a partner in the room when they are beginning their training. Again, here it was interesting to note that there were no disagreements between 5[th] years and current intercalating students. UCCT and "being a mentee" in the University system, gathered the most statistically significant results with 4 out of 6 combinations being less than 0.05.

3. How did you find your experiences of PAL in 4[th] year?

Fifty percent of the experiences cited in 'Experiences of PAL in 4[th] year' resulted in statistical significances between 4[th] and 5[th] years. Noting the nature of this question, only 3 combinations of years were compared which were 4[th]/5[th] years and each respective year compared with the current intercalating students. The younger students would have not been exposed to the 4[th] year curriculum as of yet and any results from them were discarded. Interestingly, the 4[th]/current intercalating students disagreed on 4 experiences and these were the same as those that 4[th]/5[th] years disagreed with. These included both being a mentor and a mentee within the university system, UCCT and LOCAS. Both results for LOCAS were very low being 0.001 and 0.000 respectively. The outstanding trend for 4[th]/5[th] years was 'Having an LMSS buddy'.

Continuing the trend of the first 2 questions the 5[th] years and current intercalating students did not achieve any significant differences in any of the categories.

4. How did you find your experiences of PAL in 5th year?

As the only cohort to have experienced 5th year were the current 5th years in the study, it was decided to compare the 28 students of 121 that responded that had previously intercalated in 2012-13 to the 5th years that had not taken a year to pursue another area of enquiry. There was only one discrepancy which was F1 shadowing which had a statistical significance of 0.015. It was thought unnecessary to use this combination of comparative results for any other question apart from this.

6. Please state how important you feel the following suggestions for improving Peer Assisted Learning would be to you.

This question was focused on suggestions for improvement of PAL within the current curriculum that were taken directly from themes generated by both the focus and nominal groups. All ten combinations were used in direct comparison for all questions from here on in. Five suggestions out of eight were problematic between 2nd/3rd and 3rd/5th year combinations. This could have been because they were from different generational backgrounds

The least statistical significances of all combinations were 2nd/5th, 4th/current intercalating students and 5th/current intercalating students who all had one statistically significant result less than 0.05 at 0.00, 0.006 and 0.00, respectively. The results were about Universal sharing of resources in the case of 2nd/5th years and including ward PAL time in hospital with 4th/5th years for the latter two combinations. The most controversial suggestion of the eight within this question was having a universal sharing of resources across the years for example, a system like DropBox.

8. Would it be beneficial to have PAL training?

Out of the ten combinations, 3 had statistically significant differences in $2^{nd}/5^{th}$, $3^{rd}/5^{th}$ and $4^{th}/5^{th}$ years with the latter two having a significance of 0.00. The other seven all seemed to agree that PAL training programme would be beneficial to them.

10. How much of an impact do you feel that the following barriers have in relation to PAL?

When asked about barriers it was $2^{nd}/5^{th}$ year permutation that yielded 4/6 statistically significant differences between their response. Three out of the 4 disagreements between 4^{th} and 5^{th} years were extremely significant as lack of enthusiasm, having students use obscure knowledge to appear superior to others and "teaching disinterested students" all achieved a result of 0.00.

There were no significances when discussing the difficulties of policing PAL effectively, however having a disinterested group of student to teach gained 50% percent of the 10 combinations disagreeing.

When comparing 3^{rd} and 4^{th} years correspondingly with the current intercalating students neither produced any significant results.

12. To what extent do you agree or disagree that PAL encourages the development of the following attributes?

Four of the ten combinations had no differences in opinions within this question about PAL encouragement of certain attributes i.e. teamwork, communication and the ability o present in front of their peers. The $3^{rd}/5^{th}$ years and $3^{rd}/$ intercalating students generated significant results for all five attributes that were listed with teamwork and communication being the most significant at 0.001 respectively for each. Again, for this question as has been previous there were no statistical implications from 5^{th} years and current intercalating students. Interestingly, the 4^{th} years in both comparative cases, disagreed with their compatriots in 4 out of 5 attributes but agreed with the intercalating students for teamwork and agreeing with 5^{th} years for being able to present confidently in front of your peers.

13. To what extent do you agree or disagree that PBL in the current curriculum encourages PAL in the following areas?

This question was fairly similar to the question above, however the distinction was how well the attributes were encouraged in relation to PAL within Problem Based Learning in the current curriculum. This time $3^{rd}/4^{th}$ years disagreed on 2/5 points, having had no previous problems in Question 12. As with the previous question, $2^{nd}/3^{rd}$, $2^{nd}/4^{th}$ and $5^{th}/$ intercalating students comparisons did not produce any statistical differences. In addition, the 2^{nd} and 5^{th} years also did not have any results less than 0.05. The outstanding result in this question is the $4^{th}/$intercalating comparison as there were discrepancies in all 5 of the attributes, having only disagreed on 4 items in the previous question.

15. Do you use the following social media for PAL?

Social media has a fast rising popularity within the latest generation where technology is becoming a apart of learning and it was interesting to take set of the most common social media that had been discussed and ask the cohort whether they used it for Peer Assisted Learning in medical school.

The respondents were given a simple choice of yes or no for this question and t-tests were run for the responses of 'yes' only within this study. There were no incongruities between 2nd and 3rd years. The item that garnered the most controversial response was DropBox, with 8 out of 10 combinations having a result of 0.05. Six of these eight responses were all exceptionally significant as they were 0.00. Results of 0.001 and 0.018 were generated for combinations 2nd/4th years and 5th year/current intercalating students, respectively.

Seven out of ten combinations had conflicting opinions regarding their usage of FaceBook which again had statistically significant results of 0.00 for four of these seven. They were 2nd/intercalating, 2nd/5th, 3rd/intercalating and 3rd/5th years.

Summary

This chapter has covered the results of the questionnaire. The quantitative data has been displayed in various formats, the qualitative sections have been analysed and the statistical analysis from the T-tests have been evaluated.

The questionnaire results have shown that students find PAL instrumental to facilitate learning and there are currently many existing PAL opportunities within the curriculum that are viewed positively. There are opportunities that students are not aware of and opportunities that have not been made explicit enough in terms of PAL. Teamwork and communication were the key benefits recognised by students. Barriers included a lack of allocated time within university schedules and a lack of confidence to teach others. One area of improvement discussed in response to the lack of confidence was the introduction of a teaching training programme, supported by 65% of respondents. The debate of whether this programme should be compulsory or an opt-in/out system will be explored in the next chapter. The role of social media in relation to PAL should be acknowledged with an average of 65% respondents using a form of social media for group discussions, sharing resources and using peer support from other universities. The statistical analysis showed that the most statistically significant results were between 3rd and 5th years and the least statistically significant results were between 4th and 5th years.

The following chapter will discuss the results of all three methodologies; the nominal, focus groups and the questionnaire.

Chapter Six - Discussion

Chapters 4 and 5 have highlighted the results of the focus groups, nominal group and the questionnaire. This chapter will discuss the possible limitations for each individual methodology; discuss the consequences of the overall results and what they imply individually in terms of PAL. The perceived value of the results within the current literature and the overall response to the original hypothesis of this thesis will also be examined.

Focus Groups

The results of both focus groups were remarkably similar and together generated a substantial amount of discussion. Even though there was little difference between views of the first and second focus groups, it was important to hold the second focus group in order to reinforce and strengthen the results from the first focus group.

The students were not only aware of PAL, but were able to give comprehensive definitions of PAL, fairly similar to that given by Topping (Topping 1996) although one student did express an opinion that it was a method of learning with absolutely no affiliation with the university. Most experiences were reviewed optimistically with occasional disagreements between students about a contrasting experience they had received. In particular, inter-year teaching was the most favourable situation in which teaching took place. The environment created when a session consisted only of their peers produced 'camaraderie' between the students that was not possible when a clinician was introduced. The reassurance of talking to a peer that had encountered the same experiences was comforting and supportive in the same instance. The theory of social congruence justifies the feeling of solidarity within these sessions.

Although the contentious subject of hospital mentoring programmes was debated at length; it transpires that only three participants had experienced it at two separate hospitals. The older students astutely recognised the need to expand their teaching skills in preparation for future career as 'educators' and were realistic when exploring how little they knew about the background of teaching.

In the same way that Scott Graziano (2011) found that practical skills in theatre in the US were better learnt under the supervision of their peers, LOCAS was the principal example of PAL in the Liverpool curriculum (Graziano 2011). Students felt more supported and at ease within the company of their peers with the additional benefit of having someone who had recently been through the process. A skill that was often examined was teamwork; it was apparent in group discussion, between hospital partners, during mentoring sessions and was attributed to learning in an environment that is not fixated on individual learning.

In the literature there have been many suggested improvements for peer learning although few have been put into practice (Ten Cate & Durning 2007b), most papers maintaining that more research should be done to gather a wider evidence base first (Ali & Evans 2013). A frequent theme was the introduction of PAL from earlier on in the curriculum, from 1st year if possible, in order to establish the philosophy of peer learning early. At the other end of the spectrum, 5th years were also eager to engage. These views are shared by Muir & Law (2014) and Pasquale (2002). All students established that although PAL was beneficial, currently, the system was not a fair system. Those that did not have access to extra-curricular activities or had not been allocated mentors were at a disadvantage to other students.

In light of the 2013 university affiliated mentoring programme, mentoring previous to 2013 and mentoring in 2013-14 was debated at length. The previous student society system is at an advantage of matching students with similar social interests in a social environment, enabling mentees to 'get to know' their mentors prior to beginning the mentoring programme. There is immediate seniority from the students who are taking on the mentoring role and they attend the 'meet & greet' session voluntarily. Those that are not interested are not compelled to attend. However, there are disadvantages noted by the participants of this study also. As the system is not affiliated with the university, there are no guidelines or monitoring organisation. Therefore it is down to the 'mentoring' students' discretion how often and how well they perform their mentoring duties. Many students have had very good experiences, yet there are students whom have found their 'mentors' to give sporadic or unhelpful teaching and have felt at a disadvantage in comparison to their peers.

The current university mentoring system, introduced in September 2013 has been implemented in response to student beliefs that the student society system is not inclusive of all students. The advantage of a mandatory random allocation of students is that, theoretically, that every student will receive a 'mentor' and have a 'mentee'. Practically, as mentioned in the focus groups, some students have been allocated into the reserve pool and do not presently have a mentoring or a 'mentee' role. Therefore this has not alleviated the concerns of the previous system where not every student has the same experience. This could however be explained by the differing intake of students each year into the medical school and a matching system can only be ensured if a fixed intake of students was filled every year. Some students have also experienced the allocation of a 'mentor' within the same year. As the university has only recently established this programme, the students require clarification of their responsibilities and "signposting" the guidelines that they should adhere to.

Affiliation with the university should ensure a more rigorous monitoring system although there was confusion between students within this study concerning this. This could possibly be simply that the system has recently been implemented and is still new for them.

The attitude with which peer learning is occasionally approached can be concerning. Students that are unenthusiastic, disinterested or arrogant can disrupt sessions. Confidence and trust are essential for students who are attending a session as they are relying on the knowledge base of the 'teacher'. This can be worrying from both perspectives, as in Manchester (Hill, Liuzzi & Giles 2010). However, it is also this apprehension that resolves a teacher to consolidate their knowledge previous to teaching so as not to feed incorrect information (Lockspeiser et al. 2008). This was similarly found in Manchester where the 'teacher' was also surprised at the basic level of questions that the students were asking, expecting a more difficult level. Concerns involving monitoring and time constraints were also expressed and ways in which the university could assist in alleviation of these barriers was discussed.

When discussing the statements taken from New Zealand paper (Tzu-Chieh Yu), the background of the review was not discussed and the quotes were taken in isolation. It was agreed by the majority that having an understanding of teaching would actually facilitate learning as discussed by Muir & Law (2014). Many studies have supported the use of PAL in improving communication, inferring that teaching is essential for good communication skills and the focus groups also reinforced this opinion unanimously (Foster & Laurent 2013; Pasquale & Pugnaire 2002; Ten Cate & Durning 2007b).

The appropriate and private usage of social media was encouraged by students whilst they were disappointed to learn that 'scare tactics' were still presently used to discourage 1[st] years to use it. Social media is preferable for a number of reasons; the layout is simple to use, it is accessible as the majority of students have a form of social media, resources can easily be stored and shared instantly. There is also a technology generational difference today than there was a decade ago where students are incorporating technology into most aspects of their lives; including education.

<u>Limitations</u>

There were some limitations to the focus groups. Time was a limiting factor; more focus groups would have been undertaken had there been more time available time within the students' schedules. The availability of the students did affect the group size of both focus groups, resulting in students dropping out of both sessions on the morning of each session. Focus group 1 had only 4 students, all of who were female and above 4[th] year. The restricted time of each session was 2.5 hours, constricting the depth of themes that were able to be explored in each group. Fortunately, a saturation of themes was reached in both sessions. For future work, particularly in a larger study; an increased number of focus groups would be used to ensure saturation of themes.

A degree of selection or volunteer bias is possible as the participants were asked to email their availability according to three suggested sessions. Those keen to talk about the medical curriculum and possibly those that are interested in teaching and facilitating learning using PAL would have volunteered. Students, who perhaps, are less enthusiastic about the prospect of PAL (interestingly, the cohort that contribute to barriers mentioned in this project) may have abstained from attending these discussions.

As mentioned above, focus group 1 was an all-female group. There is no evidence to suggest that this group produced any form of gender bias, as the topics discussed in that group were very similar to focus group 2, in which there were 2 males and 5 females. However, the predominantly female demographics of both groups should be acknowledged. The overall demographics of the medical school are represented as a 40:60 male to female ratio.

As is the nature of a focus group, there was copious discussion, however inevitably, the groups occasionally diverted from the focus of the discussion and became preoccupied with other themes more irrelevant to PAL. It was within the role of the supervising researcher to maintain the relevance of the discussion. However, all discussion was transcribed by the researcher before thematic analysis was applied and coding applied to all related material.

The most effective focus groups are those that harbour homogenous opinions who are comfortable to discuss everything with no person of authority present (Agar & MacDonald 1995). As VT was not a staff member of faculty and was essentially still a 'peer' all students were comfortable to discuss topics in depth that may not have occurred if VT was affiliated to management. The results would have been influenced (Norris 1997) and a saturation of themes may not have been reached.

<u>Nominal Group</u>

The nominal group results illustrate immediate thematic similarities with the focus groups and clear triangulation of themes was evident.

A concise list of items in order of important to all participants was compiled from the all attendees of the nominal group, having employed Nominal Group Technique. The most important element of PAL was direct teaching from older to younger years. The idea of seniority was most essential to the students as a vital component, interestingly when asked to purely define PAL they did not include seniority in the definition. Topping (2005) and Vygotsky (1978) have discussed the advantages of 'cognitive distance' between peers and found that seniority in form of one or two years is most beneficial (Topping 2005; Vygotsky 1978).

An improvement for the mentoring programme to clarify the role of the mentor and in what capacity they are acting was also important. It was suggested to attempt to match suitable mentors if possible, as opposed to random allocation which is the way that the 2013 University mentoring system is currently organised. However, this in practice is problematic and would be impractical to match 400 students per year to another in the year above with similar interests. Within the same remit as mentoring, another area for amendment could be the mentoring programmes in relation to the base hospitals that students are at. Those that have mentors in other trusts such as Southport or Warrington have logistical difficulties in engaging at a suitable place with their mentee that is for example, based at the Royal Liverpool University Hospital.

There was an unequivocal opinion regarding a general increase of resources whether it is practical skills from Clinical Skills, lecture slides or question sheets made in UCCT. In particular, Graziano (2011) advocates the use of peer teaching in practical skills, finding that within a surgical protocol, more steps were performed correctly when taught by a medical student peer one year senior to the learner than a qualified clinician (Graziano 2011). The appeal of a system modelled on DropBox, which many currently use, that is available to all years was suggested. There was debate over ownership of such a system, were it to exist. Would it be the responsibility of the students or would it be owned by the university? Idealistically, many students would prefer the university to be affiliated with the system in order for students to feel that the resources placed on the system are correct. A ratings system, on each resource was also suggested, in which certain resources were rated using a 5 star system to guide those to those resources that students found particularly effective. The predicament once again is monitoring and "policing". Regardless of who is responsible, there is still a question of accountability for maintenance of such a resource.

The students recognised and had encountered those with an attitude that perceived PBL curricula as a 'waste of time' and inferior to the previous traditional course. Some students had met other Liverpool students also with this attitude. Subsequently, it was decided that in order to move forward with PAL and PBL, the approach and attitude towards peer learning should be changed and restored. Focusing on skills apart from gaining knowledge base i.e. communication and teamwork should be as important as acquiring knowledge. Teaching other students incorporate many of these skills that are embedded into the ethos of PAL.

Although there has been much focus on the improvements that can be made to enhance PAL in the curriculum the students were incredibly complimentary regarding previous experiences of unofficial PAL that they maintained had facilitated learning well. There was some apprehension that if PAL was formally implemented into the curriculum, it would discourage the teaching that presently occurs. They would wish that irrespective of the outcome of this study, all unofficial teaching and PAL should continue.

<u>Limitations</u>

There were also some limitations of using a nominal group. Out of the 13 students that were present, three were male and ten were female, there were coincidentally also ten 3^{rd} year students. There is no sign of bias within the results as all students regardless of their year were randomly allocated into the two groups however it is acknowledged within this chapter that there could be an influence on the results of the nominal group in view of the majority of Year 3 students. Although the majority of the group were female gender, there is unlikely to be gender bias, considering, as mentioned above, that it is representative of the current demographic of Liverpool Medical School.

Having examined Nominal Group Technique in the literature before the session commenced, the researcher employed the technique for the first time for this study. The method was discussed rigorously with both supervisors beforehand though it is possible that there was a degree of researcher bias because of the way in which the researcher conducted the group.

Whilst the participants were encouraged to clarify the items they had written down in the silent phase, this technique minimises group discussion more than a focus group would, resulting in less scope to develop ideas. It is the nature of the method to be a structured activity however; it can also limit the activity by being restrictive and too regimented without the stimulation of a focus group.

The questionnaire results show that there are existing PAL experiences available in the Liverpool undergraduate curriculum and that a significant proportion of students has not only experienced them but has found them useful. Firstly, experiencing PAL within PBL was consistently ranked by the majority of students, across Years 1-4, as "quite useful" at 43.1%, 35.5% and 31.8% respectively. As 5[th] years no longer have PBL sessions, they were asked about the experience of "taking a PBL session" and assuming the role of facilitator. However over 85% of 5[th] year students "did not have this experience". There are a number of possible reasons that 5[th] years are not engaged with this 'service'; an unawareness of the experience, time available within their schedules or an issue of confidence in their ability to lead a PBL group. These results have demonstrated that students at Liverpool need 'signposting' as not everything in the curriculum is explicit or obvious to students. An example in the literature suggests that despite the opportunity to practise aspects of academic medicine throughout their course, students didn't realise these opportunities were there because they weren't "signposted" as such (Mulla, Watmough & Waddelove 2012). Using 5[th] year facilitation of PBL as an example, the lack of awareness illustrates a need for the curriculum to be more explicitly signposted in order for students to take advantage and reach their potential.

Conversely, UCCT has been ranked as "very useful" by the majority of students in 1[st]-4[th] year with most 5[th] years ranking it as "useful". 56.2% in 1[st]/2[nd] year, 54.2% in 3[rd] year and 67.8% in 4[th] year. The format of a UCCT session is not dissimilar to a PBL session consisting of 8-10 students facilitated by a member of staff, this time a clinician, usually GP, who tailors the session according to modules set by the university. The structure of the session seems to be the appealing feature with the additional academic support from a clinician so that the

students said that they felt they were 'on the right track'. On average, as the students have progressed through the medical school the percentage of them not engaging with both mentoring systems, from either mentor or mentee perspective elongated with each year.

Within the question regarding experiences in the $1^{st}/2^{nd}$ year, an average of 40% of students did not experience either system and unsurprisingly the largest percentage, 26.7% of those that hadn't experienced "being a mentee" in the University system were 5^{th} years. The introduction of the new mentoring programme in September 2013 would have meant that the 5^{th} years would not have been expected to have this experience in their 1^{st} year – the system had not yet been initiated. The average of students not participating in either mentoring schemes is augmented to 50% in Year 3 however, interestingly, the lowest percentage at 44.3% is "being a mentor" in the University system whereas the other aspects are all approximately 50%. Mentoring in 4^{th} year has seemed to fall further with an average of 58.7% not experiencing either side of each programme. A potential cause of the drop in mentoring could be conflicting schedules however it was be anticipated that there would be rise in "being a mentee" because of peer expertise. As the University system was only introduced as the current 5^{th} years began their final year they would have been used merely in a mentoring capacity with 44.8% not experiencing this. The qualitative responses included a criticism of a system that uses mentors from the same year as they do not agree that this fosters the same environment as someone senior.

The overall impression of extra-curricular teaching was that when it occurred it was often executed very well and becoming a great advantage. However, it is not an activity that is available to all students. As it is not a university affiliated activity, it cannot be monitored by the university and is subject to which extra-curricular activities the students are participants

of. Those that have experienced extra-curricular teaching, rank it between "very useful" and "useful" in varying degrees for each separate year group.

When entering the more clinical years of medical school (2nd year and above), the style of learning often becomes slightly different. The "basic science" learnt in first year becomes an "applied science" requiring critical thinking to determine a diagnosis (Dandavino, Snell & Wiseman 2007; Durning & ten Cate 2007). This thought process can be difficult to grasp without experiencing it within a hospital environment. Mentors allocated within a base hospital can aid this transition from first to second year by guiding the students through this process although this is not currently available at every hospital used for Liverpool undergraduates. Certain trusts i.e. Southport & Ormskirk Hospital, Blackpool Victoria Hospital and Warrington & St Halton's Hospital do not take 2nd year students due to the size of the hospital; therefore the opportunity for 4th/5th years to take up a mentoring role is unobtainable. In 2nd year, 76.7% of the respondents did experience being mentored by a 4th year in hospital and only 5.1% did not rate it useful at all. The majority of students found it useful to varying degrees, "very useful" ranked by 35.1% of those students. From the perspective of 4th year students, a vast number, 48.4%, did not experience the hospital mentoring role. The beneficial effect of being a hospital mentor seems to be less promising with a higher percentage, 11.4%, of the teaching cohort finding the experience "not useful" than the 70% of mentees that found it useful. Taking into account the amount of students that attend a hospital without the opportunity because of the unavailability of 2nd year students within that hospital, the number is less vast.

It was mentioned within the focus groups that 5th year students often find themselves in a teaching role as part of their 'apprenticeship', in preparation for teaching when FY1 doctors

and consequently "teaching students in hospital" became one of the potential PAL experiences in 5[th] year that the students were asked about on the questionnaire. There were 23.7% fifth years that did not take up the teaching role; this could potentially be explained by the amount of time they had on the ward, ascertaining how much work is required to emulate the job of the FY1 can be daunting, only 1 of the 5 rotations in 5[th] year is guaranteed on a hospital ward where they are expected to shadow a FY1 whereas the other SAMP rotations could be in a clinic or the lack of students and teaching opportunities on an A&E (Accident & Emergency) ward. The general feedback of those that did experience teaching was positive with only two students ranking it "not useful".

First year students are exposed to patient contact within general practice environment, however, students do not experience regular clinical contact within a hospital environment until the 2[nd] year. It is known that students work with a partner in hospital, often acting as a chaperone for an examination or taking histories. Fifth year could be a year of more isolated (from other students) individual learning than the years before because the focus is on the vocation so they were not asked about hospital partners as a form of PAL in that year. Generally, hospital partners across years 2-4 were rated very highly with very small percentages of students not experiencing this in each year.

Through the focus and nominal groups, LOCAS was named multiple times as a premier example of PAL. Interestingly, 36.8% ranked LOCAS as "very useful" and the proportions of students that perceived it as "useful" and conversely "did not have this experience" are nearly half, 33.0% and 11.5% correspondingly. The majority of students ranked LOCAS as "very useful" were actually 5[th] years with 45.2% of the 36.8%. Again, this is heavily based around practical skills with evidence to support the benefits from Graziano (2011).

It is important to mention that all students in the focus and nominal groups regarded as F1 shadowing in 5th year as a form of PAL. This notion was featured heavily in all discussions and then sustained through the questionnaire in both qualitative and quantitative sections. Particularly, the 4th and 5th years felt that the FY1 doctors provided them with vital peer learning examples in spite of their altered social statuses. Even though they have graduated, are no longer students, they are still considered 'peers' to the 4th/5th years. An emulation of the experiences they have had seems to motivate the students to copy the role they've seen for younger years. 68.6% 5th years felt that FY1 shadowing was "very useful" with no students that completed this section of the questionnaire ranking it as "not useful". Interestingly, noting the theory of "zone of proximal development" used by Vygotsky (1978), it seems that the 4th/5th year respondents in this study regard the FY1 doctors as having a similar semantic network as themselves with a small "cognitive distance" explaining this phenomenon (Ten Cate & Durning 2007a; Vygotsky 1978).

Improvements

The eight suggestions (CF Chapter Five and Appendix) given to the students to place in order of importance were all developed from the focus and nominal groups. Overall, all of the suggestions bar "giving time within schedules to meet mentors for allocated teaching", which was still "fairly important", were rated as "very important". Proportionally, it is remarkable to see that the year contributing most to the "very important" category for "5th years involved in 1st/2nd year teaching basic sciences", "including ward time in hospital" and "standardise PAL within hospital trusts" was the second year cohort. Potentially, this may be indicative of past experiences in 2013-4 i.e. teaching from 5th years or specific ward times scheduled and on reflection, are rating it very highly. Although all suggestions were ranked highly, a "universal sharing of resources across the years i.e. Dropbox" was considered the most important improvement to be implemented; resonating most with 67.2% of the respondents.

Curiously, two of the suggestions that individually vouch for conflicting improvements gained similar statistics. An improvement that would advocate a voluntary system of teaching, "implementing a reward scheme for those interested in teaching" and conversely, "having PAL/teaching as part of the 5th year portfolio" would indicate preference for a compulsory system – 45.7% and 46.9%, respectively. Encouragingly, it is good to see that over 50% students think that having 5th years involved in teaching and ward time with the younger years would be an improvement that would make a difference. Although this statistic appears to be biased, in terms of the large proportional response of 2nd and 3rd years; as no year group held more than 50% of the overall responses the statistic is in fact representative.

Barriers

One of the aims of this study was to identify the areas of PAL in the curriculum that existed, including the excellent areas and the barriers that exist alongside. Having recognised the barriers it would be appropriate to acknowledge them and endeavour to overcome them with attainable solutions.

The 'barriers' proposed within the questionnaire were ranked from "major" to "not a barrier". Students perceived all the statements presented to them as barriers of differing degrees. A considerable percentage of students, 44.8%, recognised "lack of enthusiasm" as a "major barrier". Only 12.5% of students considered it as a "minor barrier" or "not a barrier" (3.5%) at all. Whether a lack of enthusiasm is due to students not being interested in teaching nevertheless they are being compelled to do it or they find it hard to teach because they are uncomfortable in that environment, it will be difficult to overcome this barrier easily. On the contrary, another attitude that is proposed as a barrier is "showing off" where the majority of students are divided between "barrier" and merely a "minor barrier". Of those perceived as barriers, the majority of students found that "policing quality of teaching is hard" was concerning.

Currently, as teaching has not been formalised, there has been no need for the university to standardise it and monitor the quality. A system consisting of university affiliated feedback forms that are supervised specifically by a member of faculty could be considered; the debate of a compulsory portfolio signature or a voluntary sign-in system however still stands and does not provide a solution here. Additional methods of monitoring have been employed by schools (Chan 2010; Lavy 2007) and the university could postulate parallels between student

teachers and employed teachers. Selective medical schools in the US have awarded their students financial incentives to become peer teachers however this is not UOL policy (Pasquinelli & Greenberg 2008).

A concurring theme in this thesis is that the students feel they are constricted by time – from both student learner and student teacher perspectives. From the teaching perspective, having a disinterested group of students is also found to be a barrier. In comparison with those ranking " lack of enthusiasm" as a barrier, having a "disinterested group students" generated the same statistic. Potentially, if a formal programme were to be implemented, solutions to the above barriers could be provided. Working with faculty to arrange protected teaching time would overcome a barrier whilst incorporating an improvement; either choosing a selective opt-in system or a compulsory teaching part of the portfolio in conjunction with a reciprocal feedback programme would alleviate some of the barriers listed above slightly, if not completely.

Training

A sizeable majority (64.56%) responded that training in PAL would be beneficial which indicates that there are many students not only keen to teach others but are eager to educate themselves and enhance their own skills. Teaching programmes have been used in the past in many medical schools, particularly in US (Cross Reference Chapter Two) where the courses, although varying in length and some content, primarily instil confidence in the students. The studies have shown that from a teaching perspective, the 'teacher' gains as well as the 'student' and it is the reciprocal benefit that is important to nurture. Theoretically, Maslow's model of need has also been adapted by Ten Cate & Durning (2007), using role theory to explain how self-confidence can be fostered by teaching (Ten Cate & Durning 2007a). Once placed in a programme and having assumed the role of teacher with the social pressure of a group expecting a well-informed teacher, they are motivated to attain this position.

The reinforcement and refinement of teaching skills from such a programme enables the students to understand an effective delivery of knowledge, resulting in an enhanced experience for their future students. Given the nature of the course Liverpool deliver, it could have been assumed that the format in which this training programme should be delivered would be in a PBL delivery. The students were given five choices, of which they were allowed to select all they felt applicable; lecture, small group discussions, one-to-one teaching, an interactive course and an online peer forum discussion. Surprisingly, the "online peer discussion" was the least favourable choice with only 7.03% respondents selecting it as an option. It was followed closely by both "lectures" and "one-to-one teaching" both with an average of 25%. The students considered a "series of small group discussions" to be the optimum format for a training programme (65.91%) and an "interactive course" was also a

popular choice at 44.29%. This option supports the perception that students feel they learn best in a certain learning environment i.e. PAL.

Attributes encouraged by PAL and PBL

Five attributes deemed to be encouraged by PAL were also asked in relation to PBL. The students were asked identical attributes. In relation to PBL, PAL was replaced with "learning". The remainder; "teamwork", "communication", reciprocal benefit for teacher and student" and "ability to present in front of your peers", stayed the same. In both questions, an overwhelming majority of the respondents agreed that all attributes were encouraged by PAL and by PBL. However, intriguingly, the statistics for "strongly agree" for all attributes fell approximately 15% in relation to PBL relative to PAL . For example, 36.5% students strongly agreed PAL encouraged "ability to present in front of your peers" in comparison to only 18% students strongly agreeing with it being encouraged by PBL. The statistics for category "disagree" are higher for PBL rather than PAL. With the exception of "teamwork", achieving 3.6% disagreeing, all other attributes had less than 1.8% students disagreeing.

On the other hand, 19.5% of students disagreed that PBL encouraged "reciprocal benefit for teacher and student", a sharp rise from 1.8% in relation to PAL. This data demonstrates that students feel that all above attributes are encouraged with PAL, and though they agree that the same attributes are also encouraged by PBL they are less enamoured with PBL facilitating learning. They feel that they gain more from PAL than PBL and do not consider PBL to be as useful as PAL, though as we have discussed earlier, the process of PBL should theoretically encourage active PAL to occur. From the results, the students feel that the most beneficial delivery of PAL comes from 'peers' who are in fact senior to them rather than those in the

same year. PBL sessions typically consist of 8-10 students within the same year and students here consider this to be a less effective learning environment than PAL.

Social media and the role of social media

The most popular social media sites used in relation to PAL were FaceBook and DropBox, both with clear majorities of students using it. YouTube was used by over 50% of students for video lectures or pathology presentations. Twitter and Skype were not used by more than 7% of the study population. Students in the focus groups attributed the popularity of Facebook as a means of communication in comparison to University email system as the layout was preferable. Private groups and messages could be set up for group work and it was a means to keep in touch with multiple people for teaching schedules. DropBox, as discussed before, is not an affiliated University resource (Gannon & Hill 2012); it is an online tool where resources such as presentations or student notes can be stored for free and given a password to a certain account can be accessed by anyone in possession of that password. Students commented on the convenience and tremendous value they felt this resource had on numerous occasions throughout all nominal, focus groups and the questionnaire. Particularly, in the last two years, student year representatives from the student society have created year specific DropBox accounts, sharing the password through other social media accounts, which have contained all manner of resources and have proved to be very popular.

Having established which social media is used by students to facilitate PAL, an overwhelming majority of students, 88.18%, cited "sharing resources" as the primary use of social media for PAL. "Group discussion" and "video lectures" were the other faculties that social media was most commonly used for. As modern technology progresses, it is appropriate to consider how future generations of students will rely on technology with their

learning. Although the dangers of social media exposure should still be apprehended, especially by those that are to enter the medical profession, other sites that allow a sharing of resources could prove to be useful.

Qualitative thematic analysis for questionnaire

As an adjunct to selected questions in the questionnaire; a qualitative question was asked in order to catch any other themes that had not been previously mentioned within that section. A similar approach to the analysis of the focus groups was used to examine the results, the Framework Approach (see Chapter 3/4). The majority of the students reinforced what had been discussed during the focus and nominal groups.

Respondents identified with the experiences of PAL listed in the questionnaire with the majority concurring that these experiences i.e. teaching from 4[th] to 2[nd] years in hospital, were enormously beneficial. There were a few experiences that had not been previously discussed in depth, for example, a weekly teaching scheme set up by graduate entry students (see Chapter 5) where teaching is given by FY1 doctors or senior clinicians. An extension of students regularly receiving teaching from their extra-curricular activities, were student-led schemes set up in hospital trusts not affiliated with the mentoring aspect but purely for teaching. Students in Royal Liverpool University Hospital and Countess of Chester Hospital had implemented various teaching programmes of their own volition. The students within the Countess of Chester had introduced a weekly teaching session between 4[th] year students using case presentation format in preparation for their final exams. The Blackpool Victoria Hospital currently has a "family" programme in which every new FY1, 5[th] or 4[th] year is attached to an existing mentoring group. The group consists of a mix of students and doctors

in different stages of medical career i.e. FY1 are parents, 5th years are older siblings and 4th years are younger siblings. This programme not only has an academic focus but is an important social and emotional support network. This may have been implemented because students who are on placement in Blackpool Victoria Hospital live on-site and can be a difficult adjustment from living away from friends and familiar places in Liverpool. Parallels can be drawn between the responses of the focus groups and these responses regarding the justifications of the new university mentoring system, introduced in September 2013. It was acknowledged that the implementation of the system was a direct result of student feedback and had been instigated to apply a 'balance' that the student society programme did not have. Nonetheless, identical weaknesses of the university system were observed by students of the questionnaire and the focus groups and discussed in this section. Although the mentoring system was now compulsory, no measures had been implemented that monitored contact between students. From the perspectives of both mentoring and "mentee" roles, students had been ignored by their respective partners. Numerous respondents echoed the most important theme from the nominal group that direct teaching from older to younger years was most beneficial. The opinion that the FY1 doctors were regarded as peers and had a large impact on the clinical teaching of 4th and 5th years was reiterated by many participants. Those that had intercalated admitted to using skills learnt through PAL to help them effectively complete their intercalation degrees, like those in the focus groups.

All participants agreed that more PAL opportunities within the curriculum would increase learning opportunities effectively. All respondents agreed with all suggested improvements, and some students volunteered the modifications they thought would improve the curriculum, using the initial ideas suggested in the focus groups. There were two aspects of the suggested incentive scheme that caused apprehension; students were concerned that incentives such as

certificates for portfolios were not sufficient incentives as they were too common and other students were concerned that increasing the value of the incentive would encourage the "wrong" types of people to apply for PAL (if the programme was not compulsory). Using financial compensation was suggested however this does not comply with university policy. Students also disagreed with the fundamentals of a programme being compulsory or voluntary. This argument was related to mentoring and teaching training programme. One focus group was eager to implement a compulsory programme for PAL concerning the 5[th] year portfolio, agreeing with respondents of the questionnaire that it would create a "level playing field" and instil the attitude that teaching is a GMC requirement (GMC 2009). The debate concerning mandatory vs. compulsory has been tested by the implementation of the university mentoring programme. Overall, students agreed on the role and qualities they would perceive an "ideal mentor" to have and also that they would prefer less quality teaching over more teaching that was mediocre. This attitude was also addressed when discussing standardisation of PAL, in particular teaching received in hospital trusts and essentially is what the mentoring programme (September 2013) is aiming to achieve. Most students concurred with the focus groups that standardisation was key. Other improvements discussed more in depth were the allocation of protected time within university schedules, the details of what benefits would be born from a teaching training programme and the emulation of hospital mentoring programmes into the university curriculum. These had all been discussed thoroughly in both focus and nominal groups with a near identical overlap of themes.

The discussion of barriers to PAL was focused on the lack of space and available resources/equipment that were provided by hospitals and the university. An appropriate place for group study was felt to be instrumental in promoting PAL in more areas of the

curriculum. Again, protected time within busy schedules was also discussed with many students echoing a necessity to modify student timetables from years 2-5 in order to distribute times that were free for both teacher and learner. They did also acknowledge that this would be an enormous and time-consuming undertaking. Students felt that the Medical School had not encouraged the use of PAL. Some students in 5[th] year stated that they weren't aware of it, though this was an isolated opinion of one respondent of the questionnaire. Additional comments about PAL confirmed the overall view that it was a positive experience and students appreciated the addition of PAL in the in the curriculum. They also appreciated the contribution of PAL to PBL and the benefits this brought to their education. However, there was a discussion surrounding the emphasis on PBL being 'collaborative', therefore only functioning optimally when all participants are active. There were a very small minority of students commenting either that they did not see any opportunities for PAL in the curriculum, did not agree with the ethos of PBL or felt that there was no benefit from PAL or PBL. Most students recognised that were PAL to be integrated formally, the identified barriers and obstacles from this research would need to be alleviated for all students to experience the same opportunities.

Although the majority of students did not use social media other than FaceBook or DropBox, the most popular additional form was WhatsApp. This is another group messaging service that is similar to the messaging service of FaceBook however there are no other features. Audio and visual files can be sent through this medium. Other "apps" discussed were medically related i.e. 'Almost a Doctor' which is an online resource of published notes. Students largely agreed with the options given to them concerning what social media was used for in relation to PAL with peer support and group discussion being ranked the highest. Students appeared to be more focused on the ease of using social media and used the

reasoning 'everyone has it' multiple times. They were more likely to receive a notification through social media than through university affiliated email accounts and also appreciated that they had a form of media that they considered to be private.

A small minority of the respondents remarked that the questionnaire was complicated, caused confusion and too long to complete.

Overall, the response to PAL was overwhelmingly positive and students were enthusiastically engaging in discussion throughout the nominal, focus groups and the questionnaire. The qualitative responses from the questionnaire have confirmed the results of the focus and nominal groups by showing parallel themes and ideas from a large number of participants. The majority of students have supported the idea that were PAL to be implemented in a consistent and fair fashion with the addition of a structured teaching training programme, it would be welcomed into the curriculum.

<u>Limitations</u>

The timing of the questionnaire distribution could potentially have an influence on the final results. All mock written and practical examinations take place within the spring term, January to April, and the questionnaire was open online from February to April 2014. The overlapping dates may have affected students' decision to respond. As the questionnaires were distributed two-thirds of the way into a year it would have been difficult for students to full assess how they felt about the year they were currently in i.e. the full scope of PAL within LOCAS revision may not have been fully realised as the 4th years were possibly not yet at that point in the year.

Although the views of the 5th years were most intriguing as they were the top of the hierarchy, it is possible that recall bias may have clouded their judgement of the 1st-3rd years. They may not have been able to recall as clearly the impact of each experience was for them in each specific year. The questionnaire also did not specify when in the year they were judging each experience.

The total response rate of 52.5% (adjusted for the nine sets of data not pertaining to a year of study) for the questionnaire was satisfactory; with 67% of all 3rd year medical students responding, they became the largest cohort response making up 30% of the overall response. The second largest year group response was the 2nd year students, 60% of their year responded and contributed 25.5% to the final response. It was disappointing to note that the 4th and 5th year responses were sparser with only 40% and 44% of each year responding, respectively. The ability to reflect on the completion of the curriculum from start to end would have provided the researcher with a more absolute view of PAL throughout the years

from the older students as they would have experienced all aspects as opposed to the younger years. However, all data collected from all years was extremely useful. The timing of the questionnaire distribution would have fallen on the spring term, which as mentioned above, is one of the busiest sections of the year for both 4th and 5th years which may account for the slightly lower response rate. As the questionnaire was a voluntary exercise, it would have been impossible to guarantee a 100% response rate. Examining the trends of responses, there is an expected increase in responses it seems when a reminder email or text message has been sent. For example, within the 5th week of the questionnaire being open a peak of 226 students answered the questionnaire.

Fig 10 . A graph to show the trend of responses throughout the period the questionnaire was open (taken from SurveyMonkey)
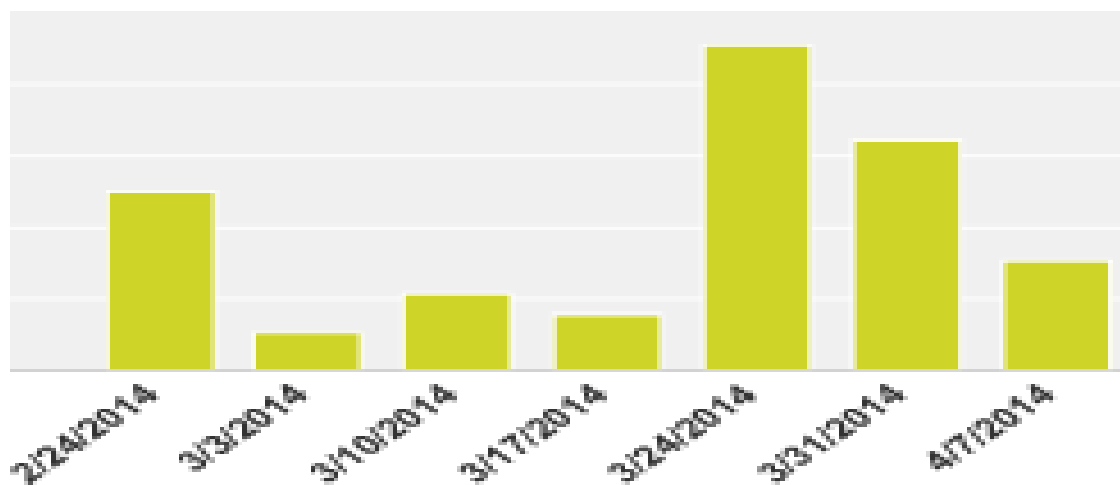
It was decided to use an online tool as the questionnaire would have been more easily accessible for medical students with busy timetables and targeting the rising popularity of smartphones and other modern technology. The prevailing difficulty of using an online tool is nevertheless distribution of the link, not the necessarily the means, of completing the questionnaire. Respondents may be able to access the link however, if they are not reading

the emails sent to the, containing the link then this method is still problematic. In hindsight, it may have been possible to attach paper copies of the questionnaire to any paperwork that was provided by the medical school office where students are required to hand in work or sign in for a PBL session. Paper copies of the questionnaire could have been sent to other trusts to gather the full potential of responses.

One of the strengths of the questionnaire design is that although the data collected is largely quantitative, there are opportunities to combine methods and gather qualitative data (CF Similarities between nominal, focus groups and questionnaire chapter below). Qualitative thematic analysis was used for these sections and the results were remarkably similar to those collected from the nominal and focus groups.

In this case, the questionnaire is specific to the curriculum and activities of the Liverpool curriculum. Medical school curricula that are similar to the Liverpool curriculum could use the results of this project without much adaptation. However, it could simply be modified and extrapolated for use in other UK medical schools with similar curricula. It may not be as useful within traditional curricula that are heavily lecture based and less focused on group work but certainly could be adapted.

Statistically significant results

As mentioned in the chapter four, there were the largest number of statistically significant differences between the responses of the 3rd and the 5th years. There were thirty six statistical differences. Comparatively, the final year students are at the top of the hierarchy at medical school and have been through every aspect of the curriculum and the 3rd years have just reached the midway point of medical school. The third year in 2013-14 consisted of speciality training in 7 week rotations of; obstetrics & gynaecology, psychiatry & neurology, therapeutics, disability & general practice and paediatrics. They have not experienced the transition into 4th year where they are under pressure of "finals" exams. The final year students were especially generous in their ratings of "teaching 2nd years from 4th years in hospital", "including ward time with older years" and this could possibly be because they have experienced the benefit of such experiences. A third year may think that theoretically it wouldn't make too much of a difference however, fifth years, having completed the final exams they can reflect on which aspects were most beneficial.

The combination of years that generated the least statistically significant differences was expectedly, the 4th and 5th years. The social congruence between the two years is unsurprising, given that they are both at the top of the hierarchy, have undergone similar clinical experiences and have passed a clinical milestone in passing the final exams. Having examined the interesting relationship between the 5th years and FY1 doctors, who are regarded still as peers, it is noteworthy to remember that in the future, that relationship will continue to foster as they pass into roles of future 5th years and FY1 doctors.

Generally, across all PAL experiences there seemed to be most disagreement between years when discussing the effectiveness of "being a University mentee" in the new 2013 system. The most homogenous results in this area were between 5th years and current intercalating students where they did not disagree on any experiences. The only discrepancy within the 5th year was "F1 shadowing" between those in 5th years that had previously intercalated and the students that hadn't. It is not clear from these statistical tests whether the students that had previously intercalated considered shadowing a junior doctor a more or less useful experience that the rest of their year. Many intercalating students express concern when considering their year away from the clinical field and the potential impact it could have on their knowledge base and practical skills. For this reason, students who have intercalated seem more eager to 'catch up' to where they feel their colleagues, going straight from finals to 5th year, may be. The 4th year students had the most statistical significances across the first three questions, concerning PAL experiences, in comparison to 2nd and 3rd year for their respective questions. Fourth year is a demanding year where students are experiencing high volumes of pressure – this could explain the disagreements they have with the younger years. A certain attitude divides the medical school just before 4th year and these results show this.

Two combinations of years achieved statistically significant results with more than 50% of the suggestions for improvement of PAL; 2nd compared to 3rd years and 3rd compared to 5th years, most noticeably the most controversial was "universal sharing of resources". The intercalating students were agreeable with both 4th and 5th years once more, achieving only one statistical significance "including ward PAL time in hospital with 4th/5th years".

Unusually, the 4^{th} and 5^{th} years' results showed that disinterested students and teachers as well as "showing off", achieving very statistically significant results of 0.00. Throughout the project these two year groups have had mostly homogenous opinions and it is strange to see them not only disagreeing but so severely to produce such a significant result. The timing of the questionnaire would have taken responses at midway point of the year – most teaching increases in frequency towards summer term when exams are approaching imminently. The effect this can have on teaching sessions can be extreme; students become disinterested as they want to concentrate on individual revision, as can the teachers in this instance being the $4^{th}/5^{th}$ years or students begin to demand an excess amount of sessions and increasing the pressure on the teachers where they become unenthusiastic.

In comparing the attributes encouraged by PAL and PBL above, these results demonstrate that 3^{rd} years generated statistical significances with both 5^{th} year and current intercalating students for all 5 attributes. The attributes with the most significant results at 0.001 were "teamwork" and "communication". Here, 4^{th} years and current intercalating students had no differences when discussing PAL however this combination generated statistical significances across all 5 attributes when discussing in relation to PBL. Many of the intercalating students are undertaking a degree, heavily lecture or lab based without much group interaction or team work. In hindsight, students partaking in these degrees realised that the PBL system was preferable in encouraging group work and communication skills – qualities they had not appreciated were attributed to PBL. Current intercalating students in the focus group mentioned that students on these lecture based courses had much poorer skills in communication and presenting work to a group and found it difficult to engage in group discussion without dissolving into arguments. This perception could account for the difference in opinions of the intercalating students in comparison to others.

Although the statistics for usage of social media were overwhelming in favour of FaceBook and DropBox, there were however very significant differences between some years. When considering the use of DropBox, 8 combinations created significances and 6 combinations generated results of 0.00. Similarly, though FaceBook was shown to be popular, 7 combinations generated statistical significances and 4 of these were 0.00. These results indicate that whilst the majority of students do use both of the above social media, within each year there are extremes of opinion as opposed to unanimous views across the board. Without these statistical significances it would seem that the overall majority use both forms of social media, but these results demonstrate a more varied response than the statistics originally illustrate.

<u>Limitations</u>

Only one type of statistical test was applied to the results within this project and it is subject to a bias of numbers that could not be relevant. All possible combinations of years were tested in order to ensure any trends between certain years could be tested however only one question used a T-test to compare the relationship within 5^{th} year of those students that had previously intercalated and those that hadn't. This inconsistency was not particularly relevant to this project; however, it does limit the conclusions that can be drawn from all results by implementing a form of selection bias.

<u>Similarities between nominal, focus groups and questionnaire</u>

The results yielded from the above three methodologies were very similar and parallels were clearly able to be drawn from them. This section will discuss explicitly the themes of clear triangulation.

Each study population in the nominal, focus groups and the questionnaire was asked about experiences of PAL in the 2013-14 curriculum. The areas of mutuality encompassed a form of mentoring. The qualitative responses of the questionnaire were almost identical to the focus group analysis with comments about the benefits of hospital mentoring schemes in the available trusts i.e., University Hospital Aintree. Without the nominal and focus groups informing the researcher about the amount of extra-curricular teaching received by students on a regular basis, it would not have been included in the questionnaire. Extra-curricular teaching is experienced by over 50% of respondents and the value of it was echoed in the qualitative responses.

The nominal and focus groups suggested many improvements for the curriculum in relation to PAL including incentive schemes, increasing accessibility of resources and allocating time within schedules. A large part of the group discussion surrounded the implementation of a teaching training programme. It was felt that an explicit statistic should be collected the questionnaire in order to gather a representative impression. The questionnaire confirmed that over 65% of the study population were keen for this to occur. This overlap between the views of the nominal, focus groups and the questionnaire was extremely significant. There was a recurring theme of instilling confidence in students who were anxious about teaching throughout the qualitative parts of the questionnaire and the focus groups.

The characteristics attributed to PAL and PBL were first discussed in the focus groups when asked about the benefits of PAL and later confirmed when considering quotes from previous studies such as 'communication is an essential part of patient-physician interaction; teaching is essential to ensure good communication for future clinicians' (Yu et al. 2011). The responses from the questionnaire agreed that communication and teamwork were directly attributed to the skills learnt from PAL and from teaching others.

Equally, the barriers discussed in both nominal and focus groups were directly transferred into the final questionnaire since the students felt so strongly about them. Barriers such as; an unaccommodating attitude from both student teacher and student learner perspective, the alleviation of conflicting schedules within the university and the lack of a functional "policing" system were all identified as obstacles. Surprisingly, not only were these all agreed upon by majority of respondents but many offered recommendations largely related to the training programme suggested above in order to provide a solution for the barriers in the qualitative part of the questionnaire.

Finally, in regards to social media, the impression from the focus groups was that nearly all students regularly used a form of social media in relation to PAL. In a similar respect to the question regarding the training programme, a representative statistic concerning the use of social media was also felt necessary. An overwhelming majority of respondents parallel to the participants of both nominal and focus groups acknowledged use of social media for similar activities i.e. organising teaching, group work and sharing of resources.

This section has demonstrated that the nominal and focus groups were important in designing the questionnaire, provided useful information in their own right and the results from them have been triangulated with the questionnaire results.

<u>Summary</u>

This chapter has examined the results in detail; the possible explanations for the results and the implications of these results on the current curriculum. The limitations for the nominal, focus groups and the questionnaire have also been discussed. The thematic similarities between all three methodologies have been evaluated and the implications this has on triangulation discussed.

The following chapter will discuss the conclusion of this thesis, summarise the recommendations from this thesis and outline the areas of further study to be done.

Chapter Seven – Conclusion

This final chapter summarises the key themes which have run through this thesis, concludes the overall findings and outlines the implications of this work for the Liverpool curriculum.

The hypothesis investigated in this study was that the students would feel that PAL was beneficial to their learning. The principal conclusions must be that the students do feel that PAL is beneficial and facilitates their learning greatly. The evidence demonstrates that there are both informal and formal opportunities for PAL within the current curriculum and students enjoy learning in this way.

A possible weakness of this thesis is that the data collected represents the students' 'perceived' benefit. There is yet to be evidence, in the form of improved assessment scores that proves a numerical benefit that students feel as a method of learning. Conclusions cannot fully be drawn on the genuine benefits of PAL until they have been formally investigated. It is in the interests of the medical school for this future work to be undertaken, as positive results would validate any potential modifications made as a result of this project and further adapt the curriculum efficiently for both students and faculty. The results of this study have been presented on two occasions, both at departmental levels within the university and at the time of writing is being written up for publication.

It is worth noting that the curriculum was in the process of change at the time of writing, with a new focus on case based discussions rather than the philosophy of PBL.

Students were greatly appreciative of the skills they attributed to a peer learning environment i.e. teamwork and communication. Although there was initial synonymous use of PAL and PBL, it rapidly became apparent that students associated PBL with a more negative outlook than PAL. This attitude could be attributed to a recent portrayal of the PBL philosophy as an undesirable form of learning (Lim 2012). More than 50% of students were able to use anecdotal and individual reflection to acknowledge both advantages and disadvantages of the PBL approach. In comparison, all attributes; teamwork, communication, ability to present confidently in front of peers, learning and reciprocity, were all perceived by students to be encouraged by PAL more than by the PBL process. An increase in confidence was considered to be accredited to the use of PAL, rather than PBL, primarily from the teaching perspective. However, the students did acknowledge that the relationship between PAL and PBL was a symbiotic one when used correctly. One student stated that the optimum programme would be 'to use PAL and PBL together'.

The potential barriers preventing PAL from becoming a "gold standard" method within medical education were also shrewdly identified by the students. Problems regarding time, willingness to engage and standardisation were all alluded to and potential solutions were also discussed. The barriers could be divided into categories of those pertaining to student's positions regarding PAL i.e. lack of enthusiasm, disinterested students, showing off and those barriers concerning the medical school for example, sympathetic timetabling to allow teaching to occur in 'protected time'. The engagement of an entire student body in a method such as PAL would require the entire institution to have absolute confidence and conviction in the approach. Understandably, the curriculum review would require tangible evidence to implement a completely new programme, of which this project is the foundations. If a PAL

project were to be implemented, all barriers must be reduced as much as possible for this approach to have a possibility of functioning successfully.

The majority of students were enthusiastic at the prospect of encompassing more PAL into the curriculum and eager to further their engagement with it in the form of a training programme. Some students voluntarily conceded that on previous occasions, teaching opportunities had been evaded as the students were insecure and anxious about teaching others. They aspire to teach however they are apprehensive about the concept because they lack confidence in their abilities. The cycle of low confidence leading to poor delivery to poor feedback and consequently reluctance to teach can only be broken by building confidence up from the most basic level. Others that are interested in teaching would appreciate the opportunity to learn more about the theoretical aspect of teaching and corroborate what they already enjoy doing. A potential training programme will be discussed in detail, later in this chapter.

Existing PAL opportunities in each year of the 5 year degree were not only identified but were recognised as positive experiences. A mentoring role was provided in a format, be it the University system or student society system, to approximately 50% students of which most enjoyed the experience. The impression felt by students that had a 'good mentoring experience' directly translated into their future practices. They ascertained that having someone of seniority with an attitude accepting of PAL, delivering effective teaching, then fostered a similar mind-set within that student. The value of that experience in turn begins to lay the foundations of successful peer teaching and mentoring relationships, a case of 'leading by example'.

The current generation use social media as a means of communication and education. It must be acknowledged that with the progression of modern technology, educational practices are obligated to adapt themselves in the same way that doctors are required to keep their knowledge up to date. With the natural advancement of technology in medicine, doctors are obliged to keep supplementing their knowledge base. The equivalent is true of technology in medical education, where a method that was suitable twenty years ago may no longer be applicable to the current generation i.e. online forums have been replaced by social media sites like FaceBook.

<u>Recommendations</u>

One of the original aims of this thesis was to identify areas to be improved and ultimately instigate change in the curriculum in relation to PAL. Below, recommendations to modify and enhance the curriculum will be discussed.

1. Implementation of a training programme

The suggestion of a training programme has been a perpetual theme throughout this project from the first focus group through to the questionnaire. Research has been done to advocate a teaching programme prior to students beginning to teach other students is beneficial on both sides (Graziano 2011; Silbert & Lake 2012).

A programme that was mandatory would ensure all students were given the opportunity to learn about the principles of teaching and how to effectively deliver a session. All students would begin with the same baseline of knowledge and throughout the programme would improve. A compulsory programme would provide all students with the tools to guarantee development of skills rather remaining at a static standard. In addition to this training programme, a simultaneous teaching 'portfolio' could be introduced where students are expected to fulfil a certain number of hours or sessions to fit with the training they are receiving.

Conversely, a training programme could be provided that would not be compulsory for all students but was available for those that were interested, an 'opt-in system'. There is evidence from this project that 65% students warrant the need for one and would welcome and appreciate a training programme. However, in a similar fashion to the mentoring programme, imposing a programme on students who have no interest in teaching may cause

them to engage less. Possibly, a compulsory programme would encourage the students who are reticent because of a lack of confidence in themselves, to attend and instil confidence. These students may not have attended if the programme was not compulsory. Nevertheless, the advantage of a programme where the students elect themselves to attend – is that they have decided to attend. This self-selection process should theoretically, eliminate students who are not interested and not enthusiastic.

The training programme should cover the basics of teaching principles, in an interactive group discussion environment, and briefly the different approaches to learning. Understanding the theory behind teaching and learning, students should begin to recognise any previous errors and cater future sessions to their audience more efficiently. Alternative techniques of delivering and presenting information in a teaching session should be covered for example, presentations, using questions; asking students to be interactive can be discussed. A session should also be dedicated to different ways to teach different groups of students – for instance a session with 15 students may be more suited to discussion work in small groups whereas a small group of 5 students may benefit from working in pairs before engaging in a discussion. As teaching is a field that the students have not been exposed to before, such a programme could prove problematic if it is assumed that they have a level of competency that they do not possess. Students should be introduced at a basic level. Some studies have introduced intensive programmes and some advocate a less concentrated course throughout the year. A template for this scheme could be the current Communication Skills programme used by School of Medicine in 1[st] year.

Following training, students would be monitored to survey their progress. This could be done through university provided feedback forms that were verified by academic supervisors. Academic supervisors currently meet students at designated supervisory meetings throughout the year. The feedback would be monitored to ensure that students were progressing and improving.

2. Alleviate identified "barriers"

Having acknowledged the barriers that affect the successful integration of PAL, it would be advantageous to alleviate all possible barriers. As mentioned above, some barriers can be categorised by involving the university to enable the barriers to be alleviated. The author understands that there is a great deal of planning and management that is involved with organising student timetables and allocating time within their schedules would be an enormous task. However, if PAL was integrated with the mentoring system and time were protected for PAL students would benefit greatly. If older students that were interested in facilitating sessions were given the opportunity to engage in sessions without foregoing ward shadowing opportunities, they would be more willing to teach. The younger students would no longer be afraid to ask for teaching, knowing that the time given to both parties was allocated and mutually beneficial.

Students fortunate enough to experience hospital mentoring programmes, put in place by the individual trusts, have emphatically praised the programmes. Those that did not experience it, felt they were severely at a disadvantage, not only from learning but a teaching perspective. The standardisation of education experiences within hospitals should be paramount as the initial development of clinical teaching is founded as soon as medical students enter their

clinical period, in this case, 2^{nd} year. It is not justified for students who have been randomly allocated to different trusts to experience radically dissimilar placements.

The introduction of an incentive scheme for students interested in teaching was suggested in conjunction with a mentoring programme that was an opt-in system.

The disadvantage to this proposal would be what the incentive would be, it has been suggested that a certificate for the student portfolio is too customary and would encourage those only interested in pursuing the academic value of the certificate. Those students that are not interested would subsequently become those with a lack of enthusiasm and indifference. An incentive, specific to education and specifically to teaching could be devised. A teaching portfolio that supplements the original portfolio or a system whereby certain activities would earn 'credits' that could amount to a degree i.e. Basic Teaching Award may be appropriate.

3. Introduction of 'formal' PAL in the curriculum

This thesis has presented many experiences of PAL. Although several have in the past been informal encounters, there is scope for them to be initiated as a formal part of the curriculum. In regards to resources, the Clinical Skills department possess a large amount of resources that are difficult to access outside of 1^{st} year sessions. The equipment is highly valuable in terms of familiarity for those sitting OSCEs or LOCAS. For 4^{th} year students who are anxious about their final examinations, it may be applicable to involve 5^{th} years in administering a series of sessions within Clinical Skills, using the equipment, for OSCE and LOCAS, if possible. Potentially, a simulated imitation of a LOCAS exam could be set up in order for 4^{th} year candidates to experience the atmosphere and timings of the examination before the final day. Prospectively, 5^{th} years could be heavily involved with the organisation and replication

of this scheme, which incidentally also benefits them as teachers. Continuing with the subject of resources, an achievable addition to PAL resources are the contribution students make to a 'question bank' within their 4[th] year UCCT groups. Every 4[th] year has the opportunity to produce MCQ style questions; it is validated by the tutors and then given to the UCCT as an exercise. Were the tutors to compile a collection of these questions, it is a resource that has been prepared by a student and monitored by a tutor.

Students currently use a logbook or portfolio as a means of monitoring progress each year. Within each logbook is a catalogue of procedures, diseases, symptoms and practical procedures that they are expected to have clerked, examined and completed by the end of the year. Records of academic supervisory meetings and teaching are also kept within this portfolio. The existing logbook template could be updated to incorporate a particular amount of mentoring sessions they have attended or teaching sessions they have received and if it were to be implemented, attendance at the training programme mentioned above.

4. Increase awareness of existing opportunities early in the curriculum.

The opportunity to facilitate a PBL session was only made aware to a small selection of the focus groups. Most of the students below 4[th] year did not realise that this was an available possibility. One student was aware only because they had experienced it in 1[st] year and subsequently became an emphatic advocate about the perceived rewards gained from that experience. Without that first-hand experience the student was not aware that facilitation as a 5[th] year was possible. Two fifth years had attempted to facilitate sessions, attending the training and completing the shadowing before taking one group individually. It was not possible to continue facilitating this group because of prevailing commitment to placement. The demands of running a PBL group on an individual basis is too much for a 5[th] year, a

more feasible notion is to have two 5th years paired to one group and allocate them time off their assigned wards in order to fulfil their full facilitating duties. However, these students were again not aware of the possibility of facilitation until the end of their 4th year. Opportunities such as facilitation should be promoted earlier in the curriculum in order to garner a wider cohort of students to participate in these activities. Without an awareness that these opportunities exist, they cannot be expected to engage.

As mentioned in the previous section of this chapter, hospital programmes should be standardised. Some students who unfortunately had no part of that PAL experience also were not aware of the existence of mentoring within hospital trusts. Had they known, they could have inquired about the system and introduced a similar programme.

<u>Further Work</u>

This project has provided a baseline of information specific to the Liverpool curriculum 2013-14 in relation to PAL. Unfortunately, the time limit to this MPhil is restricted to one year, preventing further work to be performed this academic year. However, further research should be undertaken in this area to develop and extrapolate the results from this thesis.

1. Evaluate curriculum of Liverpool 2014-15

Noting the results of this project and the review of 2013-14 curriculum at the time of writing, an explicit evaluation of PAL in the 2014-15 Liverpool curriculum should be initiated in the next academic year. Different applications of PAL will have been implemented and these need to be continually assessed and appraised. A study similar to the one undertaken for this thesis can assess the impact of the alterations again from the student viewpoint.

2. Appraise formal not perceived benefits of PAL

This project has centred its focus on the perception of benefits of PAL from the student perspective. A formal assessment of actual benefits of PAL should be performed using tools of assessment such as formative or summative examination results. These results should be correlated with the quantities of PAL received or imparted to determine the authentic relationship between the two variables. The nature of this study would not only be of interest to the existing literature but would certainly be valuable for the medical school. A cost-effective educational programme that not only enhances learning but is beneficial to the students' overall educational experience would have considerable appeal for all medical institutions in the UK. This information, alongside the results from this thesis, would provide convincing evidence to implement PAL into more medical curricula.

3. Extrapolation for other curricula

As mentioned in the chapter five, the questionnaire in this project is tailored specifically for the Liverpool curriculum. Modifications could be made to the questionnaire for it to be distributed to other UK medical schools with comparable curricula to Liverpool for extrapolation purposes. An investigation of attitudes concerning PAL, existing opportunities and educational approaches used at other medical institutions would be advantageous for furthering this project.

4. Compare and contrast existing findings

Should the above studies garner ethical approval and gather successful results, they should then be compared with the original results in this study and analysed to determine any associations. This would greatly expand the evidence for PAL both regionally and nationally.

Final conclusion

The research undertaken for this thesis has shown that students are receptive to the use of PAL in the UOL undergraduate medical curriculum. They have acknowledged the benefits of using a PAL approach. These include communication, teamwork, increasing their confidence and the advantage of reciprocity. The barriers to PAL have also been identified and this chapter has aimed to provide recommendations to alleviate these barriers. For example, a training programme in teaching, using a PAL approach, would instil confidence, educate students in the fundamental principles of teaching and provide a guaranteed basic standard in each participant. The UOL should "signpost" existing PAL opportunities such as 5^{th} year facilitation of groups of younger students, within the curriculum to increase the awareness and availability of these prospects. Allocating students' time within their timetable for PAL may also help to encourage more students to comply with this philosophy. The integration of social media as an educational tool should be accepted and the UOL should work with the recent advances in technology to further students' education with resources such as DropBox.

PAL is highly appreciated by medical students at UOL. The reciprocal benefit felt by student-learner and student-teacher alongside the continual development of communication and teamwork make PAL an exceptionally attractive tool. These skills are essential for the foundation of a patient-centred curriculum and will have a substantial bearing on their future clinical practice.

Additional opportunities of PAL in the student timetable may enhance the curriculum by promoting a more diverse and enthusiastic learning environment, which will in turn positively influence the practice of tomorrow's doctors.

Appendices

APPENDIX 1

Recruitment email for participants of nominal and focus groups

Dear colleague,

We are emailing you to invite you to participate in some nominal/focus groups which an intercalating medical student in the school of medicine, Victoria Tay, is hoping to organise. Attached is an information sheet and consent form which you will only need to complete if you decide to take part.

The aims of this study are to determine the areas of Medical Education that medical students in the current University of Liverpool Medical School programme feel would benefit from a formal Peer Assisted Learning programme. Under the current Curriculum Review, this study will add to the current support network for emotional and academic support and identify the sections of the curriculum that could be improved with peer support. We think that the most useful way of identifying how Peer Assisted Learning can be implemented most beneficially is to ask medical students who have had experience of Peer Assisted Learning to discuss it within a group environment.

The discussion groups would only take two hours maximum and will be arranged at a time that will suit you. Lunch would be provided for all participants and a certificate provided at the end of the discussion. If you feel you would like to take part then please email us or Victoria Tay (md0u928f@liv.ac.uk) directly and we will be then be in touch to make the arrangements.

This work will help develop medical education for future cohorts of medical students and if you feel you can spare the time then please volunteer to take part.

If you have any queries please do not hesitate to contact ourselves or Victoria Tay

Thank you very much for your time.

Best wishes,

Victoria Tay
Intercalating Medical Student

Information Sheet

Study Title

An investigation into Peer-Assisted Learning in current Liverpool MbChb programme.

Background/Invitation paragraph

Peer Assisted Learning is an important component of medical education. Particularly, within a PBL-based course, PAL is an integral part of the curriculum and a formal study of the different outcomes would be beneficial both regionally and nationally. If the hypothesis is correct and an improvement in learning outcomes is proved, the implementation of official PAL would be especially valuable in the University of Liverpool curriculum. PAL implies teaching occurring between fellow students where 'people from similar social groupings who are not professional teachers are helping each other to learn and learning themselves by teaching'.

The aims of this study are to determine the areas of Medical Education that medical students in the current University of Liverpool Medical School programme feel would benefit from a formal Peer Assisted Learning programme. We think that the most useful way of identifying how Peer Assisted Learning can be implemented most beneficially is to ask medical students who have had experience of Peer Assisted Learning to discuss it within a group environment. This project has the support of Dr Helen O'Sullivan, the Director of the Centre for Excellence in Evidence Based Learning and Teaching, Faculty of Health and Life Sciences.

Please take the time to read the following information and if there is anything you are not clear about please feel free to ask. Take your time to decide whether you wish to take part.

What is the purpose of the study?

The purpose of the study is to find out what medical students understand and experience from Peer-Assisted Learning. The discussions in each group will lead to the development of a questionnaire to be distributed to the Medical School students.

Why have I been chosen?

You have been chosen as a 2^{nd}, 3^{rd}, 4^{th}, 5^{th} year or intercalating medical student. We would like to hear the views of students who have been through parts of the curriculum and therefore are in a position to reflect on all aspects and their experiences of Peer Assisted Learning in the MBChB programme.

Do I have to take part?
No, taking part in this project is purely voluntary. You are free to withdraw at any time without giving a reason.

What will happen to me if I take part?

Victoria Tay, an intercalating medical student in Medical Education at School of Medicine will contact all students who volunteer to take part directly. We will hold the nominal and focus groups in Cedar House over a buffet lunch that will be provided for free for all participants in October and November 2013. We are looking for a nominal group of 8-10 participants and two groups of 5-10 participants for two focus groups. It isn't envisaged that each discussion will last for more than two hours.

Simon Watmough (SW) , research fellow, who has no management role in the School of Medicine will also be present. He is experienced at undertaking this type of research with and confidentiality will be assured. Once the focus groups have been transcribed and analysed the results will be emailed to the volunteers. The results will be used by Victoria Tay and Simon Watmough (SW) to develop a questionnaire that will be used to inform senior management of improvements in Peer Assisted Learning for future cohorts of students.

What are the possible disadvantages of taking part in the study?

 None.

What are the possible benefits of taking part?

There are no direct benefits to taking part, although you will be helping improve medical education for future cohorts of students who will be your colleagues of the future. We will also provide lunch during the focus and nominal groups for all participants as well as a Certificate of Attendance.

What will happen to the results/ will my taking part in the study be kept confidential?

All the data will be locked in a filing cabinet in the researcher's office. The tapes will be kept for transcription then destroyed after use. All focus group transcripts and completed questionnaires will be destroyed at the end of the project. No identifying markers to individuals will be on the transcripts anyway as for the point of transcription and analysing purposes as all participants will be given a number which cannot identify them in any way.

Who is organising and funding the research?

The work is organised and funded by the School of Medicine, University of Liverpool.

Who has reviewed the study?

This project has been reviewed by the head of final year Professor Richard Griffiths and approved by the School of Medicine research ethics committee.

Further information
If you require any further information please feel free to contact:

Victoria Tay, MPhil Intercalating Medical Student, School of Medicine , Cedar House, Liverpool 4th Floor, L69 3GE
Email: md0u928f@liv.ac.uk Tel: 07880916885

Or

Dr Simon Watmough (SW) , Research Fellow, School of Medicine, Cedar House, Liverpool, L69 3GE. Email: efcsw@liv.ac.uk Tel: 0151-795-4355

Or

Dr Helen O' Sullivan, Director of the Centre for Excellence in Evidence Based Learning and Teaching, Faculty of Health and Life Sciences. School of Medicine, 4th Floor Cedar House, Liverpool, L69 3GE. Email: h.m.o'sullivan@liv.ac.uk Tel: 0151-794-8752

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APPENDIX 3

Consent Form – Nominal Groups

An investigation into Peer Assisted Learning in the current medical undergraduate

programme

(Students views on effects of Peer Assisted Learning in MBChB programme)

Name of Researchers: Dr Simon Watmough (SW) and Victoria Tay

Please initial box
I confirm I have read and understood the information sheet
for the above study

☐

I understand that my participation is voluntary and that
I am free to withdraw at any time with giving a reason
without my rights being affected

☐

I agree to participate in a nominal group for the study

☐

I agree to allow the nominal group to be audio taped

☐

I agree that verbatim comments from nominal group transcripts
can be used when findings are disseminated as long
as they are not directly attributed to me.

☐

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Name of participant   Date   Signature

--------------------------------------   --
Date received by Researcher   Researchers Signature

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APPENDIX 4

Consent Form – Focus Groups

An investigation into Peer Assisted Learning in the current medical undergraduate programme

(Students views on effects of Peer Assisted Learning in MBChB programme)

Name of Researchers: Dr Simon Watmough (SW) and Victoria Tay

Please initial box

I confirm I have read and understood the information sheet
for the above study

☐

I understand that my participation is voluntary and that
I am free to withdraw at any time with giving a reason
without my rights being affected

☐

I agree to participate in a focus group for the study

☐

I agree to allow the focus group to audio taped

☐

I agree that verbatim comments from focus group transcripts
can be used when findings are disseminated as long
as they are not directly attributed to me.

☐

-------------------------------- ------------- --
Name of participant   Date   Signature

-------------------------------------   ---
Date received by Researcher   Researchers signature

Peer Assisted Learning (PAL) 'Students teaching students'

Are you Male ☐ Female ☐ ? How old are you? _____

Are you a graduate entry student? Yes ☐ No ☐
- If yes, what course did you do before? _____

What year are you currently undertaking? 2nd ☐ 3rd ☐ 4th ☐ ☐ 5th ☐
Intercalating
Have you previously intercalated or are you currently intercalating? ☐ es ☐ No
- If yes, in what course _____

1. How did you find your experiences of Peer Assisted Learning in each year? Please rate below.

*The University Mentor system was introduced in 2013 – if it does not apply to you please do not answer that question. Previously, the LMSS mentor-mentee system was the mentor system in place.

    a) Year 1 & 2

	Very useful	**Useful**	**Quite useful**	**Not useful**	**Did not have this experience**
University Mentor system 'Being a mentee'	☐	☐	☐	☐	☐
Being Y2 Buddy - LMSS mentors	☐	☐	☐	☐	☐
LMSS mentors – Having a Y2 buddy	☐	☐	☐	☐	☐
Extra-curricular teaching i.e. from sports clubs/friends	☐	☐	☐	☐	☐
Problem Based Learning (PBL)	☐	☐	☐	☐	☐
University Community Clinical Teaching (UCCT)	☐	☐	☐	☐	☐
Hospital partners (in Y2)	☐	☐	☐	☐	☐
Teaching from 4th year 'hospital mentors' (in Y2)	☐	☐	☐	☐	☐

    b) Year 3

	Very useful	Useful	Quite useful	Not useful	Did not have this experience

	Very useful	Useful	Quite useful	Not useful	Did not have this experience
University Mentor system - 'Being a mentor'	☐	☐	☐	☐	☐
University Mentor system- 'Being a mentee'	☐	☐	☐	☐	☐
Being 'Y2' Buddy - LMSS mentor	☐	☐	☐	☐	☐
Having 'Y2' Buddy – LMSS mentor	☐	☐	☐	☐	☐
Extra-curricular teaching i.e. from sports clubs/friends	☐	☐	☐	☐	☐
PBL	☐	☐	☐	☐	☐
UCCT	☐	☐	☐	☐	☐
Hospital partners	☐	☐	☐	☐	☐

c) Year 4

	Very useful	Useful	Quite useful	Not useful	Did not have this experience
University Mentor system - 'Being a mentor'	☐	☐	☐	☐	☐
University Mentor system - 'Being a mentee'	☐	☐	☐	☐	☐
Being 'Y2' Buddy - LMSS mentor	☐	☐	☐	☐	☐
Having 'Y2' Buddy – LMSS mentor	☐	☐	☐	☐	☐
Extra-curricular teaching i.e. from sports clubs/friends	☐	☐	☐	☐	☐
PBL	☐	☐	☐	☐	☐
UCCT	☐	☐	☐	☐	☐
Hospital partners	☐	☐	☐	☐	☐
Being a 4[th] year hospital mentor	☐	☐	☐	☐	☐
LOCAS	☐	☐	☐	☐	☐

d) Year 5

	Very useful	Useful	Quite useful	Not useful	Did not have this experience
University Mentor system - 'Being	☐	☐	☐	☐	☐

a mentor'					
Being 'Y2' Buddy - LMSS mentor	☐	☐	☐	☐	☐
Having 'Y2' Buddy – LMSS mentor	☐	☐	☐	☐	☐
Extra-curricular teaching i.e. from sports clubs/friends	☐	☐	☐	☐	☐
Taking a PBL group	☐	☐	☐	☐	☐
UCCT	☐	☐	☐	☐	☐
Teaching students in hospital	☐	☐	☐	☐	☐
Shadowing F1	☐	☐	☐	☐	☐

Have you had any other experiences of PAL in any year?

_____

_____

_____

Please state how important you feel the following suggestions for improving Peer Assisted Learning would be to you.

Improvements	Very Important	Fairly Important	Less important	Not important
Implement a reward /incentive scheme for people interested in teaching i.e. certificate for portfolios	☐	☐	☐	☐
Universal sharing of resources across the years i.e. like DropBox	☐	☐	☐	☐
Given time within schedules to meet mentors for allocated teaching/concerns	☐	☐	☐	☐
5^{th} years and intercalators to be involved with teaching $1^{st}/2^{nd}$ years basic sciences	☐	☐	☐	☐
Include ward time in hospital with $4/5^{th}$ years	☐	☐	☐	☐
Standardise PAL within hospitals across trusts	☐	☐	☐	☐
Having PAL/teaching as part of the 5^{th} year portfolio i.e. a teaching day so less time is missed off wards.	☐	☐	☐	☐
Encourage hospitals to have better group study/meeting space	☐	☐	☐	☐

Are there any other ways you can think of to improve PAL in the curriculum?_____

_____

_____
Would it be beneficial to have PAL training?　　☐s　　　　☐ No
- In what form do you think this training should be given? Please select those that are applicable.

Lecture ☐	Series of Small Group Discussions ☐	One-to-One teaching ☐	Interactive courses ☐	Online peer forum discussion ☐

Barriers - How much of an impact do you feel that the following barriers have in relation to Peer Assisted Learning?

Barrier	Major barrier	Barrier	Minor barrier	Not a barrier
Relying on someone else' knowledge	☐	☐	☐	☐
Lack of enthusiasm	☐	☐	☐	☐
Policing quality of teaching is hard	☐	☐	☐	☐
'Showing off' – Using obscure depth of knowledge that is not conducive to your learning	☐	☐	☐	☐
Having a disinterested group of students being taught	☐	☐	☐	☐
Time constraints	☐	☐	☐	☐

Can you think of any other barriers?
_____
_____
_____

To what extent do you agree or disagree that PAL encourages the development of the following attributes?

Attribute	Strongly agree	Agree	Neither agree/disagree	Disagree	Strongly disagree
Peer Assisted Learning	☐	☐	☐	☐	☐
Teamwork	☐	☐	☐	☐	☐
Communication	☐	☐	☐	☐	☐
Reciprocal benefit for teacher and student	☐	☐	☐	☐	☐
Ability to present in front of your peers	☐	☐	☐	☐	☐

To what extent do you agree or disagree that Problem Based Learning in the current curriculum encourages Peer Assisted Learning in the following areas?

Attribute	Strongly agree	Agree	Neither agree/disagree	Disagree	Strongly disagree
Learning	☐	☐	☐	☐	☐
Teamwork	☐	☐	☐	☐	☐
Communication	☐	☐	☐	☐	☐
Reciprocal benefit for teacher and student	☐	☐	☐	☐	☐
Ability to present in front of your peers	☐	☐	☐	☐	☐

Please add any comments about Peer Assisted Learning in the curriculum.

_____
_____
_____

Do you use the following social media for Peer Assisted Learning?

Social Media	Yes	No
FaceBook	☐	☐
Twitter	☐	☐
DropBox	☐	☐
YouTube	☐	☐
Skype	☐	☐

Are there any other forms of Social Media that you use?
_____

Which of the following do you use Social Media such as FaceBook, Twitter, DropBox, YouTube or Skype for? Please tick all the appropriate.

Peer Support ☐	Peer resources from other universities ☐	Podcasts ☐
Group discussion ☐	Videos ☐	Other ☐ Please
Sharing resources ☐	Video lectures ☐	specify_____

Do you have any further comments about Peer Assisted Learning you wish to make?

_____
_____
_____
_____

Thank you for taking the time in filling out this questionnaire

Vicky Tay, MPhil student

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