



Project Document Cover Sheet

Project Information			
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Partner Institutions	None		
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Programme Manager	Lisa Gray		

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Interim Reporting Template

Project Name: *Generation 4 (G4), St George's University of London*

Report compiled by: *Trupti Bakrania*

With contributions from: *Terry Poulton, Chris Beaumont,*

Reporting period: *September 09 – February 10*

Section One: Summary

During this reporting period the main outputs and deliverables have been case creation, delivery and evaluation activities focusing on the staff and students early perceptions of Virtual Patients (VPs) as replacement of paper PBL cases.

To date 12 virtual Patient (VP) Problem Based Learning (PBL) cases have been delivered to the students within a PBL setting, along with the release of additional web 2.0 tools and online learning resources. Early findings have indicated that the 5 year stream need additional help and guidance to introduce them onto the PBL nature of self directed learning. Likewise, PBL tutors need additional support to facilitate the transition that students face. Strategies to overcome some of the issues are described in this report.

The project is progressing well and there have been no changes to the project plan.

Section Two: Activities and Progress

The project consists of 4 phases:

- Start up
- Case creation
- Delivery
- Evaluation and dissemination

The first two phases of the project were largely described in the previous progress report and chiefly addressed the following objective

To review existing paper based PBL cases and re-write where necessary to fit new curriculum objectives.

Phase 1-Startup

The previous progress report described the completion of the start up phase, consisting of the following work packages:

- WP1 - Start up
- WP2 - Web Presence
- WP3 - Review of current practice at SGUL
- WP4 - The New delivery plan

Phase 2 -Case creation

This phase was described in the previous progress report, but is also covered during this reporting period and consisted principally of the following workpackages:

- WP5 - Select VP cases for repurposing and enrichment
- WP6 - Create e-content matrix of learning resources and tools
- WP7 - VP repurposing and content enrichment
- WP8 - Review other modules/ years, integrate enriched content

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Creation of cases

Each case is written by a subject matter expert (SME), using the VPSim authoring tool¹. The case is reviewed by a team which consists of experts in writing VP cases for PBL, a PBL tutor also reviews the case for gain a tutors perspective. Any changes which arise from the review are relayed to the SME and changes made. Once the online case is near completion, the tutor notes are created, which help tutors facilitate the PBL by providing background information on subject areas addressed by the case. The review process is shown in appendix A.

In synchrony with the PBL case of the week, two assessment cases which address the learning objectives of the week are made available for students to work on in their own time. The assessment cases are designed to give a broader understanding of the subject, and at the same time contain formative multiple choice questions or assessed branching options. Both SMEs and senior medical students create the cases, occasionally repurposed from existing cases obtained from other European partner institutions. Feedback received suggested that it was more feasible to create a case from scratch, rather than repurpose it from an existing case.

Cases are resourced with images, media and data where possible.

Phase 3 - Delivery

The delivery of the interactive online VP cases began on 1st September 2009, with the start of the Transition year (T Year), and achieved the following objectives

- To deliver 18 interactive virtual patient cases as replacements for PBL paper based cases.
- To deliver 36 adaptive assessments with these cases.
- To integrate an array of resources, assessments, and web 2.0 tools with all administrative course elements and face to face teaching, and to include delivery to mobile devices.

This phase is composed of four workpackages:

WP9 - Quality assurance review
WP10 - Testing
WP11 - Training plan and support documentation
WP12 - Embedding into the curriculum and go-live

Delivery

The first case was delivered on 1st September 2009. Students were given an introduction to the use the smart boards and access to the PBL cases.

The T year, or Transition year, is a combination of the second year of the graduate stream (4 year students) who are experienced with PBL, and the third year of the traditional school leaver stream (5 year students) who have had previously a 'cut-down' version of the PBL termed Case Based Learning (CBL). In the T year both these streams combine and form this transition year. The year is then split further into two streams A and B. One stream will be carrying out the PBL element of the course whilst the other will be on clinical practice; they alternate every 6 weeks.

Each PBL group has 8 or 9 students and a tutor, and there are a total of 18 groups. During the first two terms of the year the 4 and 5 year students are maintained in separate PBL groups. It is suggested that for the last term of this year both the streams will be mixed for the PBL.

In each group, one student will access the case via the institutional Virtual Learning Environment (VLE) Moodle. A link is provided to each tutorial in OpenLabyrinth. These tutorials are available to the students after the PBL has taken place, so they can explore the optional pathways through the case if they wish. After one T year stream has completed the 6 week PBL block, their access to the cases will be temporarily taken away, until the other stream has completed the same PBL block. This is so that

¹ VPSim - <http://vpsim.pitt.edu>

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students from one stream cannot pass on login details to the other. Full access is restored to both streams again after completion of the block.

As a group they will discuss the case as they progress through. Each case has option points and before these are made available, they are prompted with a 'stop and discuss' to alert the tutor that options will be coming up.

The assessment case can be accessed in the same way but they are delivered through either OpenLabyrinth or VPSim.

Tools

VPSim is used to author the case and deliver some of the assessment cases. It is also used as a backup mechanism if the delivery system OpenLabyrinth was to fail. So far there has not been a need to use the backup process. Each case is duplicated in the two VP systems. In the case of network failure, a backup paper version of the case is on hand to be distributed to each of the PBL groups.

Smart boards are available for students to use in each base room. The cases are projected on these where students can take notes, browse the internet and annotate the page. These notes can then be saved in variety of formats and either uploaded into their group wiki by the students, or emailed to the group.

The Moodle wiki function is used as an area for student to add their notes, one is set up for each PBL group and each member of the group has access to edit and view their group wiki. The term 'Notepad' was give to the wiki to encourage students to use them. At the start of the year, little training was provided; students were informed of their existence and help guides provided on the VLE, appendix B. A higher number of students used the wikis than we had anticipated; the way in which these were used is shown in appendix C.

With the importance of group dynamics in mind, each PBL group is provided with a Bluetooth wireless mouse, which could be operated from the table, ensuring that a student does not have to be seated at the computer, away from the group.

This phase 3 will continue until the end of the academic year.

Phase 4- Evaluation and dissemination

This phase is ongoing throughout the project and consists of the following workpackages:

WP13 - Evaluation

WP14 - Awareness and dissemination

WP15 - Reporting

- To produce a complete set of guidelines, interactive open source tools, and training and learning scenarios to enable institutions and teachers in different disciplines to set up a similar system.
- Evaluating the experiences of the learners and tutors before and after the curricular change
- To rollout these supporting technologies to the rest of the undergraduate medicine (MBBS) course.

Evaluation

In the previous progress report, the baseline data were reported. During this reporting period evaluation activities have focused on student and tutor focus groups and questionnaires for students. Details of these are provided in the evaluation section of this report.

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Awareness and dissemination

Details are provided in the communication and dissemination section of this report.

Progress/ current status

Currently G4 is successfully into its second term of delivery, 12 complete cases have been delivered to the students, along with 20 formative assessment cases. User logs are currently being studied for the case. The remaining cases to be delivered are under review,

The first tutorial of the last case will be delivered using the Virtual World, Second Life. It begins in a GPs surgery, where students can ask the patient questions, examine the patient by touching or using equipment found in a GP surgery, and order tests.

A testing day was held in February with 4 year MBBS students and PBL tutors. Students were trained to use the virtual world, and then split into groups for the PBL session with a tutor. Afterwards, focus group sessions were held with the students, and the tutors interviewed. Findings are being analysed.

Discussions regarding handover and sustainability of the project have begun in the project and steering group meetings, and improvements for the cases are being discussed.

Other activities

As well as creation and delivery of the VPs, the project has been working on associated issues such as tutor recruitment/retention covered in the issues and challenges section of this report.

A critical friend visit was hosted in November and a cluster meeting was attended in Coventry. Both meetings were informative, and a good insight into each of the projects was obtained. After attending the JISC programme meeting, a 'Cross-cluster' meeting was arranged between St George's, Open University and Hertfordshire University. Projects discussed what they could share and work together with.

Section Three: Outputs and Deliverables

The anticipated outputs of the entire project are to:

1. Provide training documentation to the wider community
2. Make exemplar cases available via the project website for the wider community
3. Develop 18 interactive tutorial cases and 36 formative assessment cases for SGUL students in the Transition year between campus based learning and full-time clinical attachments
4. Demonstrate the use of cases beyond the life of the project, as the core learning resource at the heart of the undergraduate medical curriculum.
5. Deliver Guidelines and experiences of the integration of Web 2.0 technologies with the case delivery, using example wikis.
6. Document experiences of using adaptive applications to deliver scenario- based learning
7. Deliver a comparative trial of the two VP player systems, Open-Labyrinth and VPSim for both PBL case delivery and formative assessment
8. Demonstrate the use of Second Life in PBL based on work carried out by the PREVIEW project
9. Add to the training documents already produced for G4 (these will be available towards the end the project for the wider community) and provide examples of interactive cases via the project web site.
<http://www.elu.sgul.ac.uk/g4/example-case/>

Technically the project has successfully used two VP authoring and delivery systems; both were used for the assessment cases and OpenLabyrinth for the delivery of the PBL cases. Their use has moved beyond medicine.

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An unexpected outcome is the student's use of the Wiki's, though little training was given to the students on how to use them, examples are shown in Appendix C. In a further unexpected development, first year students on the graduate stream then requested wiki's for their year. This was implemented from January 2010.

During this reporting period the main outcomes are:

1. Creation of VP cases
2. Creation of assessment cases
3. Integration and use of the wiki function
4. Produced help guides on:
 - a. accessing the cases
 - b. how to use the wiki
5. Successfully creating and testing the Second Life scenario
6. Focus groups with students and distributed student perceptions questionnaires.

Work in progress:

1. Evaluation of the Second Life testing day
2. Evaluation activities for the project – will indicate how the project is perceived by the institution
3. Planning for sustaining the delivery beyond the life of the project
4. Booklet for PBL tutors – a quick guide, how to start a PBL

With the help from JISC the project has set up a project page within the design studio. Due to the nature of the project, cases can not be released. Training guides, project documentation and the findings of the project will be made available towards the end of the project.

Section Four: Evaluation

This section provides a review of evaluation activities conducted to date, together with details of any changes and planned activities for the next six months, including the rationale/purpose for activity, planned method, participants, and timing.

The core activity within the project is to transform the curriculum delivery method, the Problem Based Learning (PBL) component of the T-Year, by replacement of paper based cases with interactive virtual patients. The evaluation is therefore focussing on the ease of transformation, student's perspectives, staff perspectives (both creation and tutoring), technical development and technology used, integration of e-learning components (such as e-Portfolios), and the possibility of using this method in other years of the course.

Progress against plan

An updated schedule of evaluation activities is provided in appendix D1. It identifies the original 14 planned activities relating to the evaluation questions, together with an indication of the current status and relevant outputs/ comments relating to each activity.

From this plan, it can be seen that the evaluation is progressing according to schedule. The evaluation can be broadly divided into three stages. In the descriptions below, bracketed numbers refer to the reference numbers of activities (rows) in the evaluation schedule.

Stage 1: Baseline data. (2)

This consisted of collection and analysis of student perceptions of their experiences of Case-based and Problem-based learning in terms of the learning process and relative importance of activities in their learning week. Results will be used to measure changes in perception after the intervention. Data were collected using questionnaire 1 (n=190). Further data were collected from tutors (n=10) regarding students' and facilitators' activities and engagement with paper based cases. This stage is complete, descriptive statistics are available in Appendix D2.

Transforming Curriculum Delivery through Technology Programme

There were similarities of opinion in both MBBS4 and MBBS5 for most questions, with students indicating relatively strong agreement with individual and group active participation in discussion. Differences between MBBS4 and MBBS5 showed in the question "*I discussed the case with students outside of my group*" (mean:MBBS4= 3.44, MBBS5= 2.64) and MBBS5 indicated greater agreement with the statement that "*discussions focussed on one or two options*" (means::MBBS4= 3.09, MBBS5= 3.52). The contrast in attitudes to learning activities between the MBBS4 and MBBS5 was revealed strongly in student ranking of the learning week, since 67% of MBBS4 students ranked PBL sessions either first or second, while only 14% MBBS5 ranked the CBL sessions in the top two categories.

Key points we identified from the tutors' perceptions survey regarding student activity are that 93% of students were moderately or very active in tutoring sessions and 95% of students were moderately or very prepared for tutoring sessions. Furthermore, tutors spend about 72% of their time asking questions or sitting silently, allowing students to formulate answers and spend about 12% of their time giving students direct information about the case. Tutors are trained to facilitate discussion among students and not give direct information about the cases. But overall, these percentages are within the expectations of PBL. A final summary item is that tutors spend 1.5 – 2.5 hours preparing for PBL/CBL sessions, which is once again within the expectations for PBL/CBL.

Stage 2: Intervention data. (3-12)

This stage consists of collection of data to analyze and evaluate the experiences of Subject Matter Experts (case developers), PBL tutors, course leaders and developers, together with student perceptions of their experiences with Virtual Patients. This stage is on target and partially complete: data from case writers' and developer's initial views of training and writing/ adapting the new cases was collected in a focus group (3, 4), conducted in July 2009. This has been transcribed and analysed to thematically.

The focus group (3,4) conducted in July 2009 revealed early impressions of five case adaptors. Analysis showed that the case adaptors who were interviewed had experienced uncertainty about how best to proceed when designing the new style branching cases. Particular pedagogical issues raised were how to ensure all learning outcomes are included in a branching scenario, and how far and to what level of detail the branches should go. Furthermore, participants considered that the time required for repurposing a case was longer than first envisaged.

Whilst training was provided for case adaptors, the trainers had found it difficult to get the case adaptors together. Training was therefore distributed and often on a 1:1 basis. These findings provide lessons for design of training programmes to ensure

- That adequate time is provided for training
- Detailed discussion of creating options and ensuring learning objectives are met in branching cases.
- Models of good practice are included.

A small focus group (n=3) in December 2009 (8) provided some early insight into students' views of the new approach. Given the small numbers, no definite conclusions can be reached, but initial reaction was universally positive when compared to paper-based cases. Benefits cited included interactivity; in particular they considered that the inclusion of choices required more thought and understanding than paper based cases. It was stated to be more engaging and realistic. The technology and concepts of virtual patients were considered intuitive, though the group dynamics could be changed through the focus of the screen and computer. Students had experienced a range of styles of facilitation, and the decisions required by the case were a focus for discussion of the different approaches.

To ensure reliability, questionnaire 1 was re-administered to students (n=190) in late February (8), following 12 weeks experience of PBL with Virtual patients.) Descriptive, and inferential statistics for a sample of the students (n=116) are available (Appendix D3). Tentative analysis of results using the Mann Whitney U-test show promising results in some areas: students reporting that they participated more actively and that the complexity and engagement were improved. There was significant increased agreement ($P<0.05$) for the following statements:

- The medical terminology used in the case was appropriately challenging for me.

Transforming Curriculum Delivery through Technology Programme

- Parts of the case intrigued me.
- Overall, the degree of complexity in the case was appropriate for students like me.
- I actively participated in the discussion about the case.
- Parts of the case frustrated me
- I was disappointed when my group made an incorrect hypothesis about the case

A comprehensive analysis of all data is scheduled for April 2010.

Since the project also seeks to explore the wider impact of integrated e-learning tools within the learning environment, it is planned to investigate students' (10) and staff (12) experiences through further questionnaire/ interviews in April 2010. Questions are derived from analysis of multiple data sources early in the project (6).

Data from PBL Tutors has been collected via questionnaire (n=10) in March 2010 to compare their perceptions of VP based tutorials to the paper-based approach. Further interviews with Tutors, Subject Matter experts (case developers), PBL tutors, course leaders and developers are scheduled for 24-March to 1-April.(7,9, 11) Data from these interviews will complement those collected in step (4), since participants will have significantly greater experience in design, development and use of VP cases.

Stage 3: Project data collection and analysis (13,14)

The final stage of evaluation consists of collecting summative project data (13, 14) and performing a thorough and systematic analysis to draw out key messages and learning from the project. This phase also includes construction of the project evaluation report, and is scheduled for June to September 2010.

Reflection on activities and changes

To date the project has progressed well, there have not been any major issues that have affected the project progressing. Minor amendments included the adaptation of training for case writers, which was delivered in a variety of ways in order to meet their needs and time commitments, and changes to make the transition for students on the 5 year stream easier from CBL to PBL.

The use of the web 2.0 technologies (wiki's) was greater than anticipated though the integration of the eportfolio was not successful due to a number of reasons:

1. The use of the portfolio needed to be identified by the institution
2. The technology would need to be developed further in order to integrate with the smart boards and/or VP delivery tools; this is outside the remit of the project
3. The institution is evaluating the use of the portfolio in its own right

Consequently the project team did not feel that at this stage that potential benefits were significant enough to warrant an increased effort to incorporate the eportfolio.

The project has continued to provide additional resources for student to supplement the cases such as 'Key Topics', links to external websites and resources in iTunes U that students can use on mobile devices.

The evaluation has also proceeded to plan, with only minor adjustments to timing. It is intended to supplement the current evaluation with a longer term assessment of the impact of VP cases on retention of clinical decision making and consequences. Methods for this are not finalised but are likely to include comparison of summative assessment results in cohorts using VPs and a control group.

Planned activities in next 6 months

Activities within the evaluation plan that are scheduled for the remainder of the project were identified above. The following table draws together those activities, with reasons, methods and timescales, extracted from the evaluation schedule.

Transforming Curriculum Delivery through Technology Programme

Ref No	Activity Collection Method / data source	Evaluation Questions / Rationale	Timescale
7	Interviews with Developers.	Explore experience/ issues in delivery	<i>Scheduled for 24-Mar to 1-Apr</i>
9	Questionnaires, interviews with Case writers	How did this process differ from the previous for case writing	<i>Scheduled for April –May 2010</i>
10	Questionnaires, interviews with students concerning integrated e-learning tools	Did this change your /the student experience?	<i>Scheduled for April 2010</i>
11	Questionnaires, interviews with PBL Tutors re experience of VP use.	Did the way you facilitated a session differ from that in the past?	<i>Scheduled for April –May 2010</i>
12	Questionnaires, interviews Staff/Tutors concerning integrated e-learning tools	Did this change your /the student experience?	<i>Scheduled for April –May 2010</i>
13	Questionnaires, interviews with developers/academics to explore sustainability issues	What are the issues and areas of potential development for using VPs in earlier years of the course	<i>Scheduled July 10 – Sept 10</i>
14	Questionnaires, interviews with project team to explore project mgt lessons	What lessons can be learned from this project	<i>Nov 08 – Sept 10</i>
15	Complete evaluation report: -Data analysis -member validation	To identify key messages, value of project for stakeholders	<i>Scheduled April-Sept 10</i>

Section Five: Outcomes and Lessons Learned

The project had transformed the way in which the PBL cases are delivered to medical students It is also the first time the Transition year (T year) has been delivered.

Vital lessons have been learned from this transition:

Differences in clinical practice

Feedback from a PBL tutor suggested that occasionally when students were on the clinical wards they encountered alternative methods to investigate the scenarios presented to them as VPs and questioned why this differed from their options in PBL. Students are advised that the clinical pathways in the VPs are those best suited for that patient scenario, and there may be more than one way in clinical practice for clinicians to carry our procedures. The VPs follow standard procedures, but they may experience different approaches during ward rounds.

Bringing together two different streams

The Transition year contains a graduate and an school-leaver stream coming together to form the T year. The graduate stream, experienced with the PBL process, took to the new style of online cases well. The school-leaver stream liked the online cases, but was not as familiar with the PBL process of problem solving, even with experience of CBL, a shorter version of PBL. In the first term undergraduate students were reluctant to discuss the case in depth, and go thorough the discussion phase of problem solving; this was challenging for the tutors for the first three to four weeks. Once the students understood the process and the depth that was expected of them, they enjoyed the cases.

Technical

Our backup procedures have not had to be used as yet; all cases are accessed via OpenLabyrinth. Each PBL room is provided with a wireless Bluetooth mouse to allow the case to be played from around the table. In the first term the e-Learning Unit provided the mice at the start of each session and then collected them after the session, this was to avoid the mice going missing, this was quite

Transforming Curriculum Delivery through Technology Programme

time-consuming. In the second term the mice were left in the rooms and the wired mice removed, towards the end of the term mice were being swapped from one room to another resulting in the mice failing to pair with their Bluetooth dongle device.

Solutions on how best to manage this issue are being discussed with the Audio Visual department, along with long term sustainability of technology required to the online case to be delivered.

Outcomes

The evaluation section outlines the main findings to date. The focus group with the students confirmed one of the project's main objectives: encourage students to make real life decisions in a safe environment. It also encourages students to discuss the scenarios as a team and found the VPs were more engaging than the paper cases.

Training for case writers can be adapted to fit their needs and timescales; this will be taken into account when designing future training workshops.

Improvements for the next academic year

To make the transition for undergraduate students from CBL to PBL smoother the first case of the year will be turned into a training case. The graduate stream has a similar case in their first year of PBL. Training cases are designed to have prompts for the students as they progress through the case, encouraging students to discuss at certain points in the case, enabling them to think about the types of questions they should be asking.

A quick guide for PBL tutors will be created which will cover the main themes of how to start a PBL group, group dynamics. An additional training half day workshop was set up for tutors to share their experiences and learn from each other.

Better coordination between the different departments within St George's.

Section Six: Communication and Dissemination Activities

The project continues to disseminate according to the original project plan. The interest and awareness of embedding VPs in the curriculum has increased since the last reporting period. The team has presented at many international meetings, and has been asked to consult on VP creation and embedding, and to provide workshops.

- Six fully-funded international workshops have been held to provide participants with a hands-on experience with G4 and the process of writing a case. One was held for an international group at St George's, two in Australia (Darwin and Alice Springs), two in Japan (Niigata and Tokyo) and one in Hong Kong. Typically these have been 2-day workshops.
- An invited presentation was given at the mini-symposium on virtual patients and simulations in medical education in Maastricht by Dr Terry Poulton. The link provides more detail and access to the presentation: <http://www.criticalthinking.nl/evipsymp/>.
- An article has been submitted to the higher education academy (HEA) to be released in the April addition of its newsletter.
- The project will continue to be disseminated during and beyond the life of the project. It is likely that an article will be published in the internal St George's news, St George's is co-hosting a conference on virtual patients which G4 has co-funded.
- The project website is currently being reviewed, it is being restructured in terms of layout and content is being added and updated, the project blog continues to be updated, once the new site is live we hope to include short clips of student perspectives as well as posts from case writers.

Transforming Curriculum Delivery through Technology Programme

- The project is co-hosting the 2nd international conference on Virtual Patients and MedBiquitous Annual conference, April 26-28 2010 at County Hall, London:
<http://www.medbiq.org/events/conferences/2010/index.html>
- It is anticipated that towards the end of the project best practice and other documentation will be made available to the community via the project website and the design studio.

Section Seven: Issues, Challenges and Opportunities

From the start of the project till now there have not been any changes to the original risk analysis or none of the issues have become live. The original table is shown below:

Risk	Probability (1-5)	Severity (1-5)/	Score (P xS) /closed	Action to Prevent/Manage Risk
Staffing: Failure to appoint clinical experts	1	4	Closed	Workload will be divided between teaching staff at SGUL; financial support available for the additional work for existing part-time staff.
Staffing: Departure of key staff e.g Project Manager, Project Director, Case trainer	3	1	Closed	Workload to be shared among like skilled staff – SGUL is fortunate to have a range of managerial and technical skills inn the e-Learning Unit
Organisational: Failure to engage staff with the project	1	3	Closed	Financial incentive for staff involved in construction, early engagement of tutors, positive response from the pilot.
Organisational: Failure to meet project milestones, including completion of cases on time	2	4	8	Prior agreement with funded staff on a framework for triggering relocation of task as necessary. Draw upon the experiences of the pilot which was completed to time. Schedule for planning resources, repurposing and enrichment with built in safety factors.
Organisational: Failure to complete key documentation on time	1	3	3	High quality management and communication plan: complete as soon as possible and appoint team members to help where necessary; there are sufficient trained e-Learning managers and skilled personnel at SGUL to ensure satisfactory completion.
Organisational: Difficulties with/reliability of user feedback	1	2	2	Involve all stakeholders in the evolution of evaluation strategy; strategy to include collection of data from the start of the project; external evaluator to assist with collection of data and analysis. No difficulties experienced with the pilot.
Overspend on budget	2	1	Closed	Monies to be sourced from internal funding.
Technical: difficulties due to implementing adaptive teaching	1	3	3	Traditional paper methods of PBL will be used in the short term until the risk is resolved.
Technical: Failure to find suitable resources	2	2	4	Create new resources to compliment the case, in-house.
Political: resistance to accept change, curricula change	3	3	6	Institutional agreement from top level agreeing change

Challenges and opportunities

During the summer break, the medical school underwent extensive renovation, this included creating new PBL rooms for the increased number of students. A week before the start of the T year some of the PBL rooms were incomplete and equipment not installed. The e-Learning unit put into place contingency plans to ensure the delivery of the first PBL went smoothly. This included having back up computers, projectors, whiteboards ready to put into place. By the time of the PBL delivery several rooms had still not been signed off by the construction company and had to be used with partial faculties.

Transforming Curriculum Delivery through Technology Programme

On the first day of delivery, laptops were placed into those rooms without computers and hard-wired internet connections, portable whiteboards into those rooms without and backup rooms were created in the event of total failure of a whole room. A team of 10 people patrolled the PBL rooms to troubleshoot.

These contingency plans were in place for two to three weeks with a progressive step-down of support until all rooms were complete and fully equipped. An outline of the contingency plan can be found in appendix E

St George's has now only a small number of experienced PBL tutors. Tutors found it challenging to facilitate the students on the 5 year stream who were only used to the shorter version of PBL – CBL.

A tutor refresher day was held in December where tutors could meet to share the challenges they had faced and ways they had overcome them. The more experienced tutors were able to suggest methods they had used in the past. This was a positive outcome and tutors liked being able to share their experience, and meetings of the same nature will be held in future. A quick guide on how to start a PBL group will be created for tutor's reference.

The project has highlighted the importance of retaining experienced tutors and the contingency plans the e-Learning Unit put into place to ensure the start of term went smoothly even though it was outside the units remit.

Section Eight: Collaboration and Support

The joint programme meeting held in November was very informative; it was interesting to gain insight into developments within the design strand, as well as seeing how well the other projects within the delivery strand have progressed. An outcome was that a cross cluster meeting was organised with ourselves, Hertfordshire University and the Open University. This meeting was held in December where the projects outlined their main aims, further meetings and collaborations are to be set up.

Another cluster meeting was arranged, hosted by Coventry University. This meeting looked at the progress each of the projects has made since the last meeting, we were able to share what had worked and where improvements could be made and any challenges faced. It is proposed the next meeting will be held in Newcastle in the spring. Meetings with our critical friend have been held and another one is due to take place in the near future.

The support from the programme manager has been excellent; questions have been answered quickly and with sufficient information. The level of support from other JISC components has been appropriate and very useful. Help that we have received both in setting up the page in the design studio, and from the teaching and learning experts meeting have also been very helpful.

Section Nine: Financial Statement

Total Grant	£200,000	Duration of project	2 years
Reporting Period	September 2009 – February 2010		

Budget Headings	Total budget allocated	Expenditure this reporting period	Total expenditure to date	Further information
Travel & Subsistence	£5,200	£141.40	£750.70	This includes travel costs for cluster meetings. When the project moves into the dissemination phase it is anticipated that the funds will be used there
Equipment	£2,000	£1,047	£1,047	The project has purchased one laptop. Flip cameras or similar equipment for evaluation activities are to be purchased
Dissemination activities	£8,000	£5,091.70	£5,091.70	This includes sponsorship for the conference http://www.medbiq.org/events/conferences/2010/index.html The next reporting period, dissemination costs will include improvements to the project website and blog as well as any dissemination at upcoming conferences.
Evaluation activities	£13,000	£84.53	£200.45	Transcription of student focus group. Our external evaluator will be sending us an invoice for work done during this reporting period – this will be included in the next report. Most of this will be spent during the next reporting period

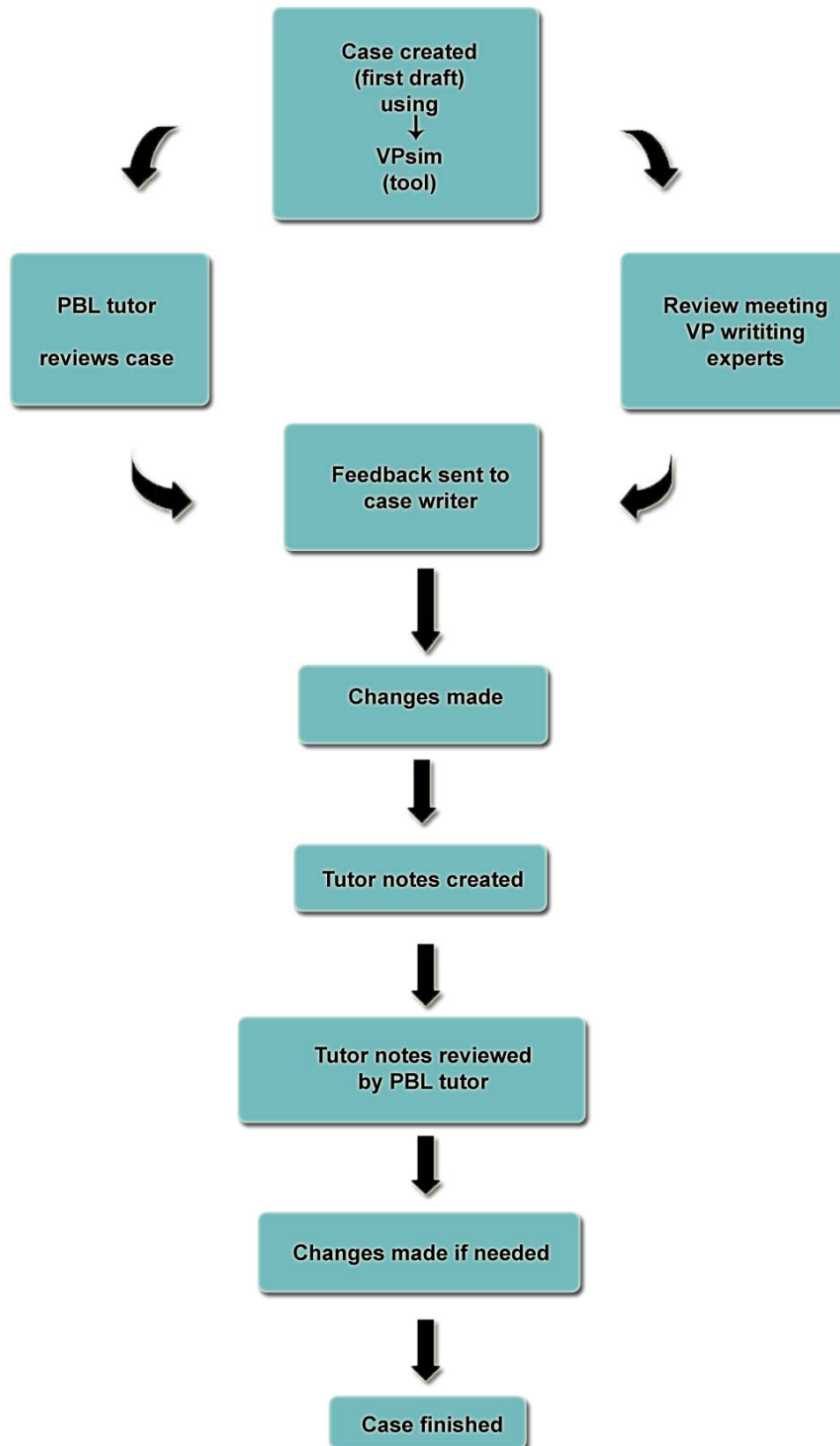
The project is within budget and has no changes

Transforming Curriculum Delivery through Technology Programme

Please note: Please remove Appendix E before making the report public

Appendix A

Case review process:

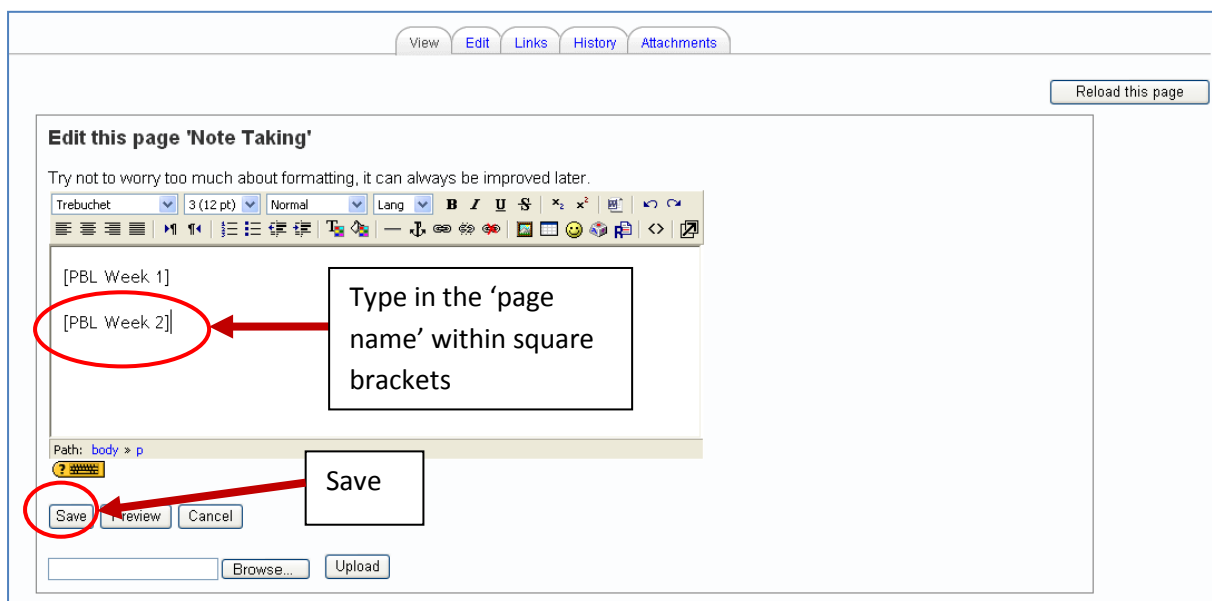


Adding a Page within the 'Notepad'

To add a 'New page' within the 'Notepad' log on to Moodle and access the case of the week and then click 'Notepad' button:



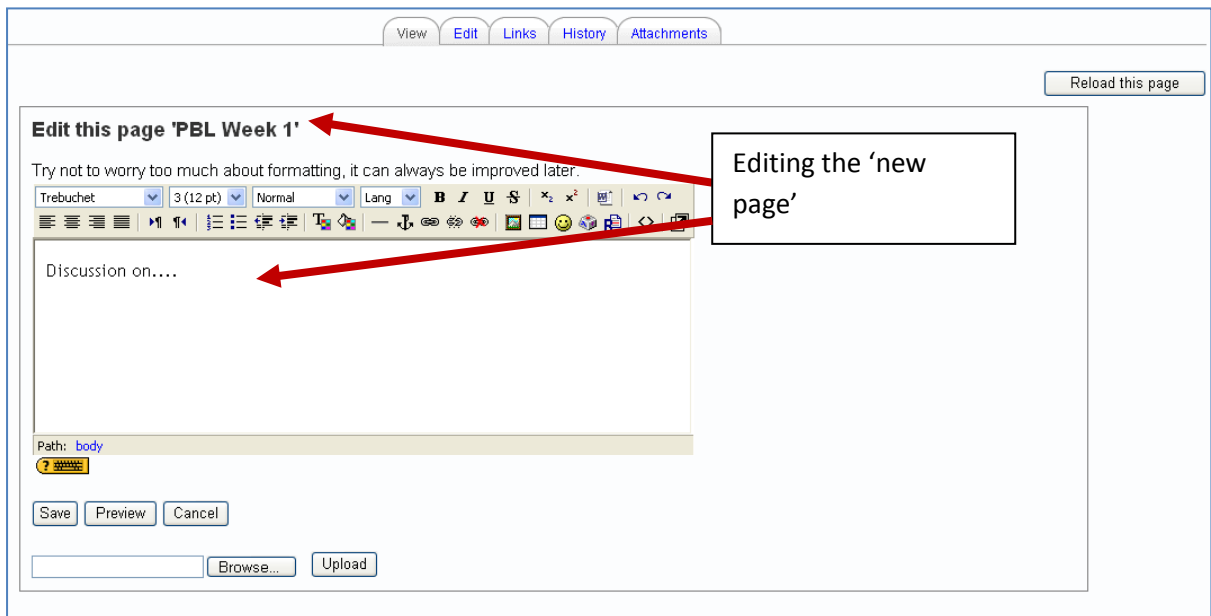
To add a new page to the 'Notepad', you will need to type in the name of the page encompassed in square brackets, such as [PBL Week 1], this is shown below:



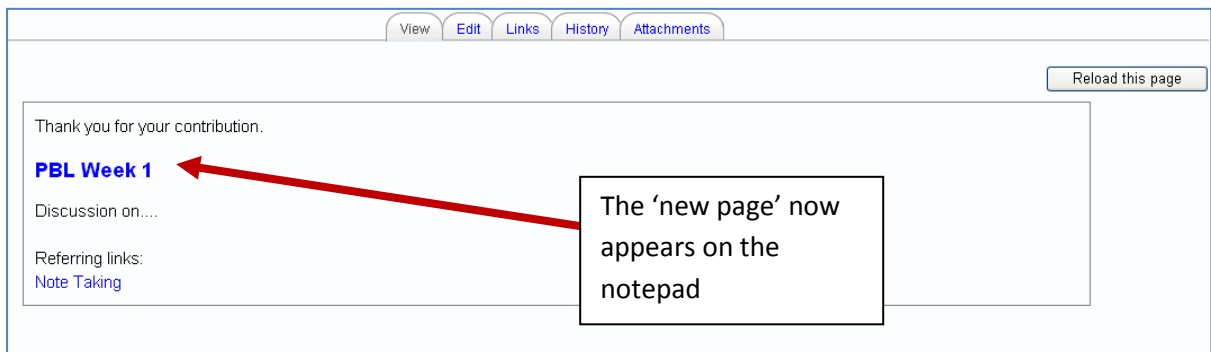
Click on the 'Save button'. The 'Notepad' automatically makes the word a link with (?) mark; ready to create a new page if someone clicks on this (?) mark. This should look like the following example below:



Once you have clicked on the question mark it will bring you to the new page where you can edit it, example shown below:



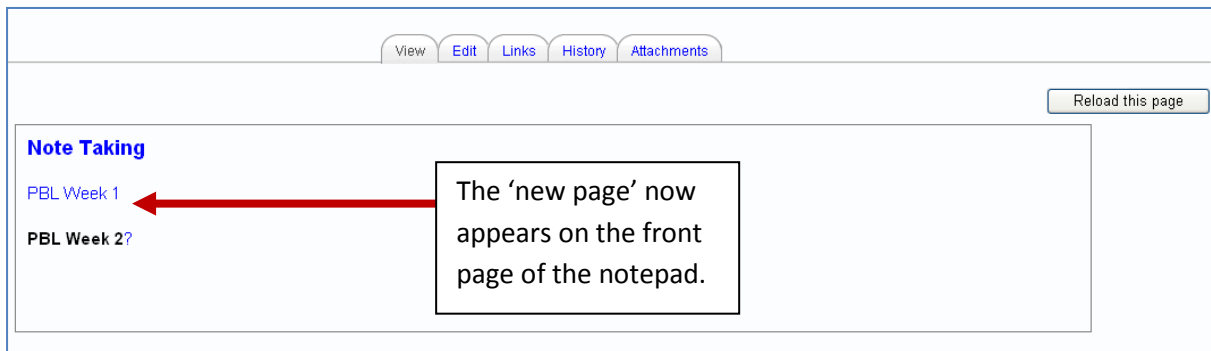
To save the changes click the 'Save' button, this will then make your new page available in the 'Notepad', example shown below:



Referring links:
[Note Taking](#)

To go back to the front page of the 'Notepad' click the 'referring link's ':

The Front page of the 'Notepad' should now contain the page created, as shown below:



Appendix C

Student usage of Wiki's

Students were provided little support on how to use the wikis. Below is a summary indicating what students mainly used the wikis for:

Students created separate pages for the different cases by case names or week numbers:

11.Note Taking Week 1 Week 2 Week 3 Week 4	12. Note Taking Rita and Ravi Chowdhury Toby Stephenson Fred Gage - child soldier
---	---

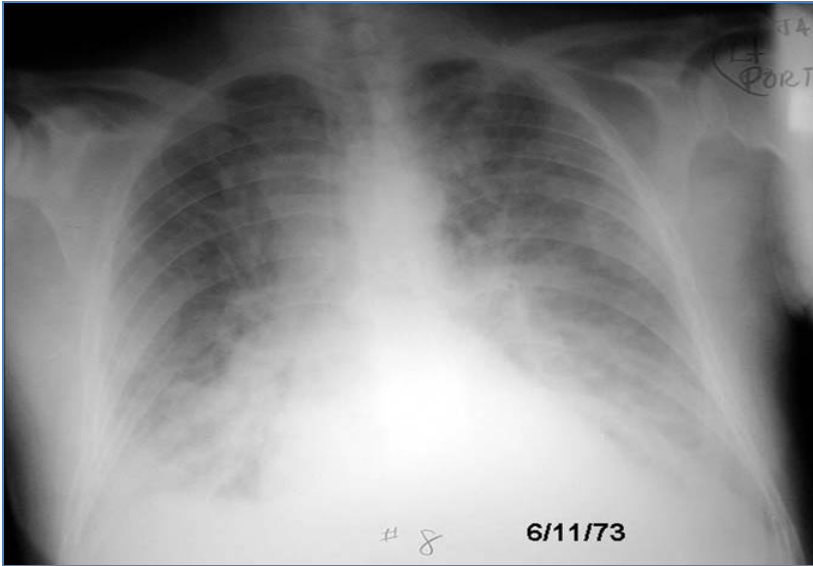
They used the wiki's to:

List learning objectives, create notes of symptoms, the example below shows a table listing the symptoms for left and right heart failure:

Left Heart Failure	Right Heart Failure
Symptoms:	Symptoms
<ul style="list-style-type: none">• Reduced exercise capacity• SOB (wheeze, orthopnoea)• Cough (haemoptysis)• Lethargy & Fatigue• paroxysmal nocturnal dyspnoea.	<ul style="list-style-type: none">• fatigue• SOB• Nausea• Ankle swelling
Signs:	(distension and fluid accumulation in areas drained by systemic veins) Signs
<ul style="list-style-type: none">• cardiomegaly –displaced apex• S3 or S4 with tachycardia –“gallop”• Functional mitral regurgitation• Crackles at lung bases	<ul style="list-style-type: none">• JVP distension• Tender smooth hepatic enlargement• Dependent pitting oedema• Ascites

Appendix C

Along with images taken from the case itself, e.g. x-ray of the chest:



Links to external websites relating to the case:

useful websites

<http://en.diagnosispro.com/> (differential diagnosis website - basically type in the symptom and it gives you a list of conditions in which the symptom exists)

<http://www.wilkes.med.ucla.edu/Diastolic.htm>

<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=cardio&part=A39> (ECGs)

Link to Moodle's Life Cycle info

<http://www.rcpch.ac.uk/>

Appendix C

Some groups also attached files which they wanted to share with their PBL group, this included images and text files, as well as sharing information:


Attachments of 11.Note Taking

 Oxyhaemoglobin_dissociation_curve.png, 39K

File is of type: image/png
Uploaded on: Sunday, 25 October 2009, 08:20 PM, by 


Downloaded 1 times

 clotting_cascade.gif, 18K

File is of type: image/gif
Uploaded on: Friday, 16 October 2009, 07:56 PM, by 

Downloaded 5 times

 syphoadrenal_response_to_shock.cfm, 152K

File is of type: image/jpeg, application/octet-stream
Uploaded on: Wednesday, 14 October 2009, 03:47 PM, by 

Downloaded 3 times

Pedigree chart presentation:

http://biology-1-j.westside.anderson5.net/modules/locker/files/get_group_file.phtml?fid=186095&gid=39865&sessionid=3fce96d42c2bab6bdaeb79699f8a95b?

GMC guideline on confidentiality in genetic testing:

New guidance released by the UK [General Medical Council \(GMC\)](#) says that **doctors may in some circumstances share confidential genetic information about patients with their relatives against the wishes of the patient.** The guidance recognises that the obligation of confidentiality is not always absolute, and that **information about an individual may be disclosed without their consent if (and only if) it is necessary to prevent serious harm to another person.**

The wiki's were also used to analysis case results and relate learning objectives to them:

Rita and Ravi Chowdhury

Rita (F29)
HxPC overwt., irregular periods, hirsutism

PMHx Acne, Appendicitis

Ix testosterone - 3 (high end)
FSH - 5 (low end)
LH - 15 (low end)
T4 - 11.7 (low end)
TSH - 4.38 (high end)
Prolactin - normal
Progesterone - 6 (low)

Ravi (M32)
HxPC Smokes occasionally, Drinks 25-30 units

PMHx Orchidoplexy @ 6yrs

Ix Decr. sperm count, Decr. motility (40%), Decr. morphology (10%)

LOBS 1:

- Semen analysis
- Revise menstrual cycle and hormone actions
- Physiology of normal fertilisation

Appendix D: Evaluation

Evaluation data collected.....	1
Appendix D1: G4 Evaluation Schedule updated 19-Mar-10.....	2
Appendix D2: G4 Baseline Data	4
G4 Baseline Data Student Results (Questionnaire 1)	4
Learning Process Questions	4
Descriptive Statistics	5
Student Ranking of Learning Week.....	6
G4 Tutor Baseline Data	7
Appendix D3: G4 Intervention data	10
G4 Intervention Data Student Results post-test (Questionnaire 1)	10
Preliminary Statistics.....	10

Evaluation data collected

As of 26 March 2010, the following data were available for G4.

Purpose	From	Date
Baseline survey: group learning & individual preparation	MBBS4 & MBBS 5 students	Mar 09
Baseline survey: group learning & individual preparation	MBBS4 & MBBS 5 Tutors	Mar 09
Baseline survey: rank-ordering items in the learning week	MBBS4 & MBBS 5 students	Jul 09
Focus group about training for case writers	Case writers	Jul 09
Student focus group	T-Year students	Dec 09
Test data from Second Life case	T-Year students	Feb.10
intervention questionnaire	T-Year students	Feb 10
Intervention survey: group learning & individual preparation	MBBS4 & MBBS 5 Tutors	March 10

Appendix D1G4 Evaluation Schedule updated 19-Mar-10

No	Timing	Factor	Evaluation Questions / Reason	Indicator	Source of information	Collection Method	Date/ status	Output/ comment
1	Nov 08 to Feb 09	Phase 1: start-up preparation of plans, team assembly	What is the project team's learning from phase 1?	Clear articulation of phase 1 outcomes, project aims, risk factors.	Project team, bid document, Data collected in stage 1	Documentation analysis	Complete	Project plan
2	Feb 09 to May 09	Students' perceptions of PBL/CBL	What are students' prior experiences of (and attitudes towards) PBL/CBL?	N/A	2nd year MBBS5, 1st year MBBS4	Student Questionnaire	March 2009, Complete	G4 Student Baseline Data: Moderate & Strong Responses
3	March 09 to Sept 09	Communication with teams Training tutors	Experiences of trainer and trainees	Successful case writing	Trainer, module coordinator, case writers	Trainer and trainee interviews	July 2009, Complete	G4 Focus Group Summary
4	Feb 09 –Dec 09	Developers experiences working with case writers	What Issues in terms of time, complexity, branching versus linear, deadlines	Developer/Academic perceptions, Time/cost data	Developers	Developer interviews, document analysis	Initial interviews Jul 09, Complete Further data in Mar/April 2010.	G4 Focus Group Summary
5	May 09 to June 09	Student trial of cases	What are students' views on using this method of delivery?	Students' perceptions	3rd,4th year students MBBS	Student Questionnaire, Focus group	<i>Summer 2009 and Feb 2010, Complete</i>	<i>Initial formative review of VP cases in 2009. Test data from SL case 24.02.10</i>
6	<i>Jan- March 2010</i>	Prioritise evaluation questions for T year using above baseline data	Will form baseline on student thoughts and views on VPs. Cas	Students' perceptions	Baseline data	Data analysis	<i>Questionnaire changes – Feb 2010 Questionnaire design March-Apr 2010 (stage 9-10)</i>	<i>Minor changes to follow-up questionnaire (Feb) complete – stage 8</i>
7	Sept 09 – Jan 10	Developers' experiences of delivery	What issues in terms of Time, complexity, (branched vs. linear).	Developer/Academic perceptions, Time/cost data	Developers	Interviews, Project document analysis.	<i>Scheduled for 24-Mar to 1-Apr</i>	<i>On target</i>
8	Sept09– June 10	Students' experiences using VPs	How did this differ, and did they find it useful	Students' perceptions	T year feedback	Questionnaires, interviews	<i>Dec 09 (Focus group) and Feb 2010 (Questionnaire)</i>	<i>Student focus group, and questionnaire data collected-require analysis</i>

March progress report Evaluation Appendix

9	Sept 09- June 10	Staff experiences using VPs (creation)	How did this process differ from the previous for case writing	Staff perceptions	Case writers	Questionnaires, interviews	<i>Scheduled for April –May 2010</i>	<i>On target</i>
10	Sept09– June 10	Students’ experiences with integrated elearning tools	Did this change your /the student experience?	Students’ perceptions	Student T year feedback	Questionnaires, interviews	<i>Scheduled for April 2010</i>	<i>On target</i>
11	Sept 09- June 10	Staff experiences using VPs (tutoring)	Did the way you facilitated a session differ from that in the past?	Staff perceptions	Staff/Tutor T year feedback	Questionnaires, interviews	<i>Scheduled for April –May 2010</i>	<i>On target</i>
12	Sept 09- June 10	Staff experiences using integrated elearning tools	Did this change your /the student experience?	Staff perceptions	Staff/Tutor T year feedback	Questionnaires, interviews	<i>Scheduled for April –May 2010</i>	<i>On target</i>
13	July 10 – Sept 10	Sustainability	What are the issues and areas of potential development for using VPs in earlier years of the course	Developers/Academic s perceptions		Questionnaires, interviews	<i>Scheduled for July – Sept 2010</i>	<i>On target</i>
14	Nov 08 – Sept 10	Project management	What lessons can be learned from this project	Project manager, core project team	Project team feedback, lessons learned log	Questionnaires, interviews	<i>Data being collected</i>	<i>On target</i>
15	April-Sept 10	Dissemination	To identify key messages, value of project for stakeholders	Completed report	Evaluation data collected	Analysis of project data.	<i>Preliminary analysis of early data started</i>	<i>On target</i>

Appendix D2: G4 Baseline Data

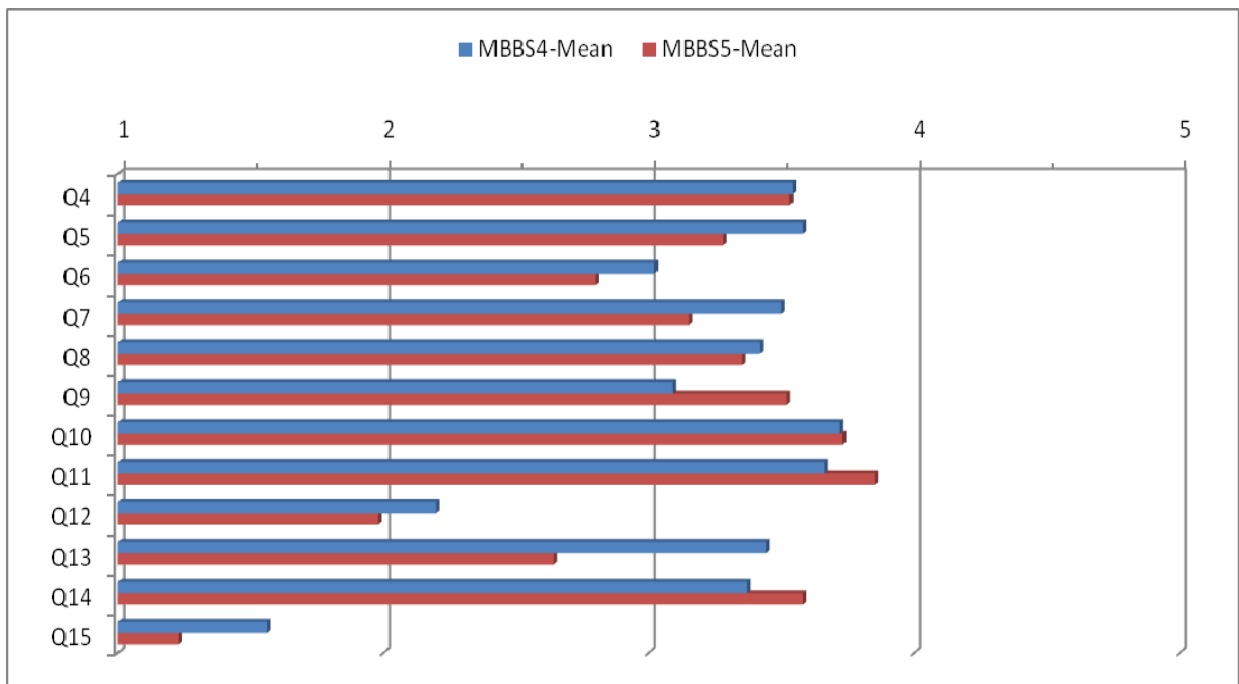
G4 Baseline Data Student Results (Questionnaire 1)

Learning Process Questions

These questions focused on how engaged they were, the level of group discussion, and how challenged they felt. Likert scale questions were used with 1=strongly agree and 5=strongly disagree.

4. I could imagine the patient in the case as a real person.
5. The medical terminology used in the case was appropriately challenging for me.
6. Parts of the case frustrated me.
7. Parts of the case intrigued me.
8. Overall, the degree of complexity in the case was appropriate for students like me.
9. During each stage of the case, group discussions focused on one or two options.
10. I actively participated in the discussion about the case.
11. All members of my group added comments to the discussion.
12. I was disappointed when my group made an incorrect hypothesis about the case.
13. I discussed the case with students outside of my group.
14. I focused my reading on the main or preferred hypothesis my group discussed.
15. Approximately how many hours did you spend re-reading the case, outside of your CBL sessions?

Results for each question are shown in the chart below. Statistically significant differences occurred on questions 5, 7, 9, and 13.



Descriptive Statistics

MBBS4: Descriptive Statistics

1=strongly agree and 5=strongly disagree	N	Min	Max	Mean	SD
Q1-3: Case Quiz	69	7	13	11.59	1.332
Q4-I could imagine the patient in the case as a real person.	80	1	5	3.54	1.102
Q5-The medical terminology used in the case was appropriately challenging for me.	79	1	5	3.58	.871
Q6-Parts of the case frustrated me.	80	1	5	3.02	1.136
Q7-Parts of the case intrigued me.	80	1	5	3.5	1.019
Q8-Overall, the degree of complexity in the case was appropriate for students like me.	80	1	5	3.42	.952
Q9-During each stage of the case, group discussions focused on one or two options.	80	1	5	3.09	.970
Q10-I actively participated in the discussion about the case.	80	1	5	3.72	1.125
Q11-All members of my group added comments to the discussion.	80	1	5	3.66	1.030
Q12-I was disappointed when my group made an incorrect hypothesis about the case.	79	1	5	2.2	1.192
Q13-I discussed the case with students outside of my group.	80	1	5	3.44	1.178
Q14-I focused my reading on the main or preferred hypothesis my group discussed.	80	1	5	3.37	1.247
Q15-Approximately how many hours did you spend re-reading the case, outside of your CBL sessions?	65	.5	6.0	1.562	1.5013

MBBS5: Descriptive Statistics

1=strongly agree and 5=strongly disagree	N	Min	Max	Mean	SD
Q1-3: Case Quiz	110	5	13	11.40	1.383
Q4-I could imagine the patient in the case as a real person.	110	1	5	3.53	1.202
Q5-The medical terminology used in the case was appropriately challenging for me.	109	1	5	3.28	1.079
Q6-Parts of the case frustrated me.	110	1	5	2.8	1.179
Q7-Parts of the case intrigued me.	110	1	5	3.15	.994
Q8-Overall, the degree of complexity in the case was appropriate for students like me.	109	1	5	3.35	1.142
Q9-During each stage of the case, group discussions focused on one or two options.	109	1	5	3.52	1.059
Q10-I actively participated in the discussion about the case.	109	1	5	3.73	1.103
Q11-All members of my group added comments to the discussion.	110	1	5	3.85	1.039
Q12-I was disappointed when my group made an incorrect hypothesis about the case.	110	1	5	1.98	1.196
Q13-I discussed the case with students outside of my group.	110	1	5	2.64	1.311
Q14-I focused my reading on the main or preferred hypothesis my group discussed.	109	1	5	3.58	1.125
Q15-Approximately how many hours did you spend re-reading the case, outside of your CBL sessions?	107	.0	4.0	1.227	.8698

March progress report Evaluation Appendix

Student Ranking of Learning Week

The tables below show how MBBS 4 & 5 students ranked parts of the learning week. Note, there are many more responses from MBBS 5 students, than MBBS 4.

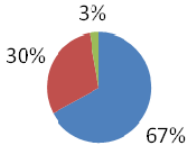
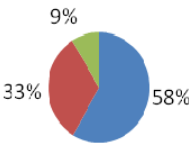
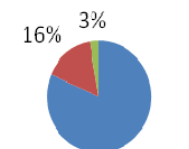
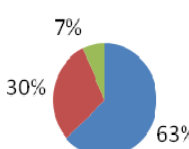
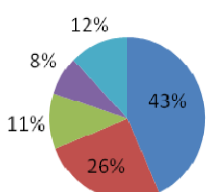
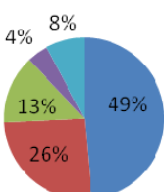
MBBS 4

1. The items below contain events that are part of your learning at SGUL. Please rank these items, with 1=most important and 7=least important.								
	1=most important	2	3	4	5	6	7=least important	Response Count
PBL	33.3% (6)	33.3% (6)	5.6% (1)	5.6% (1)	16.7% (3)	0.0% (0)	5.6% (1)	18
Clinical skills	50.0% (9)	27.8% (5)	22.2% (4)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	18
Communication skills	0.0% (0)	0.0% (0)	16.7% (3)	5.6% (1)	22.2% (4)	16.7% (3)	38.9% (7)	18
Expert forum	0.0% (0)	0.0% (0)	0.0% (0)	16.7% (3)	27.8% (5)	33.3% (6)	22.2% (4)	18
GP visits	0.0% (0)	5.6% (1)	22.2% (4)	44.4% (8)	16.7% (3)	5.6% (1)	5.6% (1)	18
Lectures	16.7% (3)	33.3% (6)	33.3% (6)	11.1% (2)	0.0% (0)	0.0% (0)	5.6% (1)	18
SSC	0.0% (0)	0.0% (0)	0.0% (0)	16.7% (3)	16.7% (3)	44.4% (8)	22.2% (4)	18
<i>answered question</i>								18
<i>skipped question</i>								0

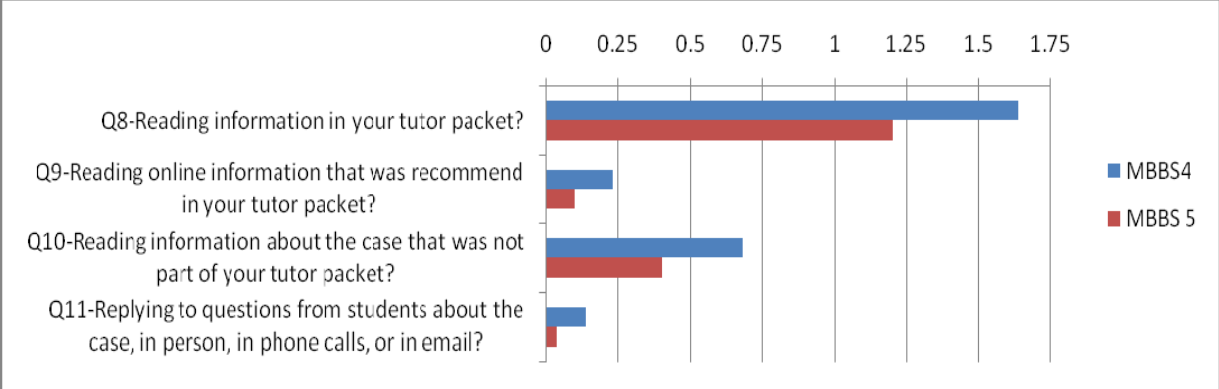
MBBS 5

1. The items below contain events that are part of your learning at SGUL. Please rank these items, with 1=most important and 7=least important.								
	1=most important	2	3	4	5	6	7=least important	Response Count
CBL	3.7% (6)	9.8% (16)	22.0% (36)	29.3% (48)	22.0% (36)	12.8% (21)	0.6% (1)	164
Clinical skills	38.2% (63)	44.2% (73)	7.9% (13)	3.0% (5)	4.2% (7)	1.8% (3)	0.6% (1)	165
Communication skills	6.6% (11)	16.2% (27)	36.5% (61)	19.8% (33)	13.8% (23)	6.0% (10)	1.2% (2)	167
Expert forum	4.3% (7)	1.8% (3)	1.2% (2)	0.6% (1)	3.7% (6)	20.1% (33)	68.3% (112)	164
GP visits	4.2% (7)	4.8% (8)	12.5% (21)	25.0% (42)	27.4% (46)	20.8% (35)	5.4% (9)	168
Lectures	48.2% (81)	21.4% (36)	15.5% (26)	7.7% (13)	3.0% (5)	1.2% (2)	3.0% (5)	168
SSC	1.7% (3)	5.2% (9)	7.5% (13)	13.3% (23)	22.5% (39)	31.8% (55)	17.9% (31)	173
<i>answered question</i>								184
<i>skipped question</i>								0

G4 Tutor Baseline Data

<p align="center">MBBS 4 Tutors</p>	<p align="center">MBBS 5 Tutors</p>																								
<p align="center">Q2-4: How Many Students:</p> <ul style="list-style-type: none"> ■ Q2-Were very active in today's discussion? ■ Q3-Were moderately active in the discussion? ■ Q4-Were minimally active in the discussion?  <table border="1"> <caption>Q2-4: How Many Students (MBBS 4 Tutors)</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Q2-Were very active in today's discussion?</td> <td>67%</td> </tr> <tr> <td>Q3-Were moderately active in the discussion?</td> <td>30%</td> </tr> <tr> <td>Q4-Were minimally active in the discussion?</td> <td>3%</td> </tr> </tbody> </table>	Category	Percentage	Q2-Were very active in today's discussion?	67%	Q3-Were moderately active in the discussion?	30%	Q4-Were minimally active in the discussion?	3%	<p align="center">Q2-4: How Many Students:</p> <ul style="list-style-type: none"> ■ Q2-Were very active in today's discussion? ■ Q3-Were moderately active in the discussion? ■ Q4-Were minimally active in the discussion?  <table border="1"> <caption>Q2-4: How Many Students (MBBS 5 Tutors)</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Q2-Were very active in today's discussion?</td> <td>58%</td> </tr> <tr> <td>Q3-Were moderately active in the discussion?</td> <td>33%</td> </tr> <tr> <td>Q4-Were minimally active in the discussion?</td> <td>9%</td> </tr> </tbody> </table>	Category	Percentage	Q2-Were very active in today's discussion?	58%	Q3-Were moderately active in the discussion?	33%	Q4-Were minimally active in the discussion?	9%								
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Q4-Were minimally active in the discussion?	9%																								
<p align="center">Q5-7: How Many Students:</p> <ul style="list-style-type: none"> ■ Q5-Were very well prepared to discuss the case? ■ Q6-Were moderately prepared to discuss the case? ■ Q7-Were minimally prepared to discuss the case?  <table border="1"> <caption>Q5-7: How Many Students (MBBS 4 Tutors)</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Q5-Were very well prepared to discuss the case?</td> <td>81%</td> </tr> <tr> <td>Q6-Were moderately prepared to discuss the case?</td> <td>16%</td> </tr> <tr> <td>Q7-Were minimally prepared to discuss the case?</td> <td>3%</td> </tr> </tbody> </table>	Category	Percentage	Q5-Were very well prepared to discuss the case?	81%	Q6-Were moderately prepared to discuss the case?	16%	Q7-Were minimally prepared to discuss the case?	3%	<p align="center">Q5-7: How Many Students:</p> <ul style="list-style-type: none"> ■ Q5-Were very well prepared to discuss the case? ■ Q6-Were moderately prepared to discuss the case? ■ Q7-Were minimally prepared to discuss the case?  <table border="1"> <caption>Q5-7: How Many Students (MBBS 5 Tutors)</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Q5-Were very well prepared to discuss the case?</td> <td>63%</td> </tr> <tr> <td>Q6-Were moderately prepared to discuss the case?</td> <td>30%</td> </tr> <tr> <td>Q7-Were minimally prepared to discuss the case?</td> <td>7%</td> </tr> </tbody> </table>	Category	Percentage	Q5-Were very well prepared to discuss the case?	63%	Q6-Were moderately prepared to discuss the case?	30%	Q7-Were minimally prepared to discuss the case?	7%								
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Q7-Were minimally prepared to discuss the case?	7%																								
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March progress report Evaluation Appendix
Q8-Q11 How many hours did you spend:



March progress report Evaluation Appendix

Descriptive Statistics

MBBS 4: How many students were:	N	Min	Max	Mean	SD
Q2-Were very active in today's discussion?	10	.0000	1.0000	.671426	.3162288
Q3-Were moderately active in the discussion?	10	.0000	1.0000	.299993	.3190800
Q4-Were minimally active in the discussion?	10	.0000	.1429	.028571	.0602339
MBBS 5: How many students were:	N	Min	Max	Mean	SD
Q2-Were very active in today's discussion?	15	.0000	.8571	.584909	.2132480
Q3-Were moderately active in the discussion?	15	.1250	1.0000	.326841	.2133851
Q4-Were minimally active in the discussion?	15	.0000	.2500	.088228	.0917917
MBBS 4: How many students were:	N	Min	Max	Mean	SD
Q5-Were very well prepared to discuss the case?	10	.5714	1.0000	.814286	.1788094
Q6-Were moderately prepared to discuss the case?	10	.0000	.4286	.157143	.1572150
Q7-Were minimally prepared to discuss the case?	10	.0000	.1429	.028571	.0602339
MBBS 5: How many students were:	N	Min	Max	Mean	SD
Q5-Were very well prepared to discuss the case?	14	.0000	1.0000	.632789	.2648912
Q6-Were moderately prepared to discuss the case?	14	.0000	1.0000	.296767	.2804383
Q7-Were minimally prepared to discuss the case?	14	.0000	.4444	.070432	.1341534
MBBS 4: How much time did you spend:	N	Min	Max	Mean	SD
Q8-Reading information in your tutor packet?	11	.50	3.00	1.6364	.86865
Q9-Reading online information that was recommend in your tutor packet?	11	.00	.50	.2273	.26112
Q10-Reading information about the case that was not part of your tutor packet?	11	.00	2.00	.6818	.71668
Q11-Replying to questions from students about the case, in person, in phone calls, or in email?	11	.00	.50	.1364	.23355
MBBS 5: How much time did you spend:	N	Min	Max	Mean	SD
Q8-Reading information in your tutor packet?	15	.50	3.00	1.2000	.72703
Q9-Reading online information that was recommend in your tutor packet?	15	.00	1.00	.1000	.28031
Q10-Reading information about the case that was not part of your tutor packet?	15	.00	1.50	.4000	.57321
Q11-Replying to questions from students about the case, in person, in phone calls, or in email?	15	.00	.50	.0333	.12910
MBBS 4: How much time did you spend:	N	Min	Max	Mean	SD
Q12-Helping students use their own knowledge to identify issues in a case, such as asking questions.	9	30	70	43.33	14.142
Q13-Sitting silently so students can re-read the case and their notes.	9	0	60	25.56	20.069
Q14-Giving direct information about the case.	9	0	20	11.11	6.009
Q15-Other	9	0	50	7.78	17.159
unacct_q12_13_14_15	9	.00	30.00	12.2222	9.71825
MBBS 5: How much time did you spend:	N	Min	Max	Mean	SD
Q12-Helping students use their own knowledge to identify issues in a case, such as asking questions.	14	10	80	48.57	19.945
Q13-Sitting silently so students can re-read the case and their notes.	14	10	90	25.71	21.381
Q14-Giving direct information about the case.	14	0	30	13.57	9.288
Q15-Other	14	0	30	4.29	9.376
unacct_q12_q13_14_15	14	.00	60.00	7.8571	16.25687

Appendix D3: G4 Intervention data

G4 Intervention Data Student Results post-test (Questionnaire 1)

Preliminary Statistics.

Descriptive Statistics (1= strongly agree, 5 = Strongly disagree)					
	N	Min	Max	Mean	SD
I could imagine the patient in the case as a real person.	116	1	5	2.34	.952
The medical terminology used in the case was appropriately challenging for me.	116	1	5	2.34	.941
Parts of the case frustrated me.	116	1	5	2.59	1.157
Parts of the case intrigued me.	116	1	5	2.40	.986
Overall, the degree of complexity in the case was appropriate for students like me.	116	1	5	2.28	.931
During each stage of the case, group discussions focused on one or two options.	116	1	5	2.49	1.099
I actively participated in the discussion about the case. (1=Strongly Agree)	116	1	5	1.87	.992
All members of my group added comments to the discussion.	115	1	5	2.15	1.179
I was disappointed when my group made an incorrect hypothesis about the case.	116	1	5	3.47	1.115
I discussed the case with students outside of my group.	116	1	5	3.41	1.134
I focused my reading on the main or preferred hypothesis my group discussed.	116	0	5	2.32	1.010
Approximately how many hours did you spend re-reading the case, outside of your PBL sessions?	115	.0	6.0	1.361	1.4964
Valid N (listwise)	114				
Mann-Whitney U-test			Mann-Whitney U	Asymp. Sig. (2-tailed)	
I could imagine the patient in the case as a real person.			10541.5	0.501	
The medical terminology used in the case was appropriately challenging for me.			9047	0.008	
Parts of the case frustrated me.			8330.5	0.000	
Parts of the case intrigued me.			9008	0.005	
Overall, the degree of complexity in the case was appropriate for students like me.			9019.5	0.005	
During each stage of the case, group discussions focused on one or two options.			9747.5	0.088	
I actively participated in the discussion about the case. (1=Strongly Agree)			8521.5	0.000	
All members of my group added comments to the discussion.			9985.5	0.174	
I was disappointed when my group made an incorrect hypothesis about the case.			8139	0.000	
I discussed the case with students outside of my group.			9199	0.013	
I focused my reading on the main or preferred hypothesis my group discussed.			10142	0.245	

Appendix E

