

CHAPTER 6: RESEARCH FINDINGS

This chapter will focus on the research findings drawing from the instructional system and the observations of the lessons, including information from the interviews that were conducted with both Faculty and students. These discussions focus on how, using the principles of illuminative evaluation, the prosthodontic – content – rich DLPs were used to adjudicate whether the curriculum innovation was internalised in the prosthodontics curriculum. It therefore seeks to look for matches and mismatches between what was ‘intended’ and what was ‘realised’.

The study has these questions:

- i) In what ways are the intentions of the prosthodontic programme within the hybrid – PBL curriculum being realised (or not)?
- ii) What, if any, issues emerge during the observation phase?

Content analysis of the various documents, as outlined in the previous chapter, together with the lesson observations (see Appendix 3), assisted in generating a description of what was operationalised. Through information derived from observation of the lessons as well as via the interviews, themes were identified. Themes were derived inductively and categorised as:

- i) The teaching process and processing of the information by the students in the small group contact lessons
- ii) Use of lesson time
- iii) The group dynamic
- iv) Application of the learning experience
- v) Emphasis on integration of the information or content knowledge.

The first three apprise the first research question and the latter inform the second question.

The Teaching Process

In as much as there were no specific documents prescribing the ‘how to teach’, information pertaining to this aspect of the study was derived from document analysis from the various structures such as the Curriculum Task Force later known as, EDUCOM, and currently called the Teaching and Learning Committee; the Prosthodontic Department workshops, documents informing the teaching and learning practices specific to the department (for example, The Year Book) and departmental meetings. What also helped the process was the fact that the researcher had been intimately involved in the development and coordination of the PBL aspect of the hybrid – PBL curriculum and had intimate knowledge of the process as it unfolded in the early stages of the curriculum innovation, as well as being a staff member of the prosthodontic department.

As illustrated in the earlier chapters, in the hybrid – PBL curriculum (Chapter 5), students are taught in small groups of about eight to twelve students. The group meets with its appointed facilitator, who is a member of staff in the school, for two hours once a week for about three to four weeks, depending on the length of the case to be discussed. In each of these cases, the subject matter (discipline / subject) content and skills are integrated around a central theme and these are multidisciplinary in nature. At the start of the DLP, the students are given the paper case, with any other resources as prescribed. The DLP provides them with information about the schedule of meetings, an introduction of the case with the broad aims outlined, and a vignette of the case to be discussed. The main educational vehicle is the tutorial group under guidance of the facilitator who invariably was the content specialist for the cases under discussion. During the two – hour meeting, the students discuss the theory informing the case; they have to analyse the case, initially based on their prior knowledge. During the initial analysis, the students hypothesise about possible underlying principles, mechanisms and processes that may explain the phenomena under discussion and described in the DLP guided by the objectives set for each case.

They may attempt to formulate learning issues or concepts that could assist in addressing the case under discussion in order to solve the problem.

At the start of the DLP with the two groups observed, there was some attempt to follow the prescribed PBL methodology. However, the method was not followed as per prescription (see Appendix 6 – in the Facilitator guides where the process is outlined).

With the first group (Group A) the facilitator did not introduce, nor allow the students to introduce themselves. This is reflected in the DLP process wherein the expectation is that as final year students, this aspect of the process need not be performed (see DLP addendum). Instead, he started reading through the DLP and followed that immediately with asking if the students knew about ‘clearing’. Students were not given an opportunity to follow the prescribed pattern of how to conduct the lesson. The explanation given by the facilitator was that:

this group of students have been together for the last five years
and by this time they know one another well enough as they
have been doing DLPs for the last five years

He further went on to argue that

as I was one of the core group of staff involved in the
facilitation of student groups, I have come to know the students
well and felt no need to follow the prescribed process to the letter.
It does not allow creativity with how the process unfolds

This deviation from the process may interfere with the learning process and group dynamic (Moust, van Berkel and Schmidt, 2005; Bhattacharya, Gupta, Jewitt, Newfield, Reed and Stein, 2007). What was glaringly obvious was the fact that the group did not set any ground rules to inform how the process was to pan out. It can be argued that this did not allow the participants to be open about how they wanted to run the process and none of them brought this omission to the attention of the other members. It therefore meant that there were no explicit expectations set that informed

how the group was going to conduct the lessons. This may also have had some impact on the group dynamic and may therefore interfere with the learning process wherein there may be limited or no contribution from students who may be overlooked or feel overlooked, or those who feel that as no ground rules had been agreed on at the start, that they have the opportunity to then not participate.

The second observed group (Group B) did not fare any better. However, in this particular group, the facilitator, even though introductions were not conducted, allowed students to choose the officials right at the onset. Similarly, as observed with Group A, no ground rules were set and the lesson started immediately with the student who had volunteered to chair the session reading aloud the DLP to the rest of the group. However, with this particular group, it was the student chairperson who, after one of the group members suggests setting ground rules, deemed it not necessary.

Fatima tells the group that they need to come up with ground rules for their group, however Verushka says that there is no need for the rules. No one in the group counters this viewpoint, they let it stand without any comment.

(see Appendix 3.4B: Group B)

The next stage of the process – the clearing - was also not followed through efficiently. Only one Group (A) undertook the clearing process. The other (Group B) did not even venture into this aspect. This may not have allowed participants to ‘clear the air’ as intended by the process. It has been hypothesised, within the school, that by clearing, it enables participants to understand where each one of them are emotionally at that given point in time and may assist with attainment of an effective and efficient group dynamic. Even though Group A did have a clearing phase, the way it was conducted left certain students out, who had to then ‘find their voice’ and become part of the process. One of the students in Group A did not participate in the clearing process at all, and neither the chairperson, nor the facilitator seemed to notice this omission or oversight.

Instructions given in the facilitator guide for the DLPs stress the necessity of undertaking the ‘clearing’ process

Clearing

At the beginning of any and each small group session, go round the group, and each person (including the facilitator), should tell the group what is presently occupying their head space. Only after unloading current preoccupations, can a group member truly focus on the task of the group.

(see Appendix 6: Facilitator Guide)

The clearing process was therefore only performed in one lesson at the beginning of the face – to face contact opportunity. It was not done at all the small group lesson times as intended. This may have implications on the emotional space that each participant was in and may have impacted on the unfolding of the lesson as participants were not given an opportunity to ‘share’ before the start of each lesson.

The facilitator was directive in Group B, as he directed the students on how to approach the case under discussion

... we’ve got to do mind maps

(see Appendix 3.4B: Group B)

He did not allow the students the creativity to decide for themselves how to conduct the lesson. On follow-up interview he stated that

I like to tackle the case as a mind – map, as it allows the students to think broadly around the central issue or theme and I find that students have taken to the concept of mind – maps quite enthusiastically

This approach seemingly has an element of a ‘non student – centred’ approach, wherein the opposite – a teacher centred directive approach is evident. One of the principles that underpin PBL curricula is the student centred learning approach that characterises this pedagogy as it is intended to allow for ownership of the learning issues by the students (Schmidt, 1983).

Another explanation may be that these subtle deviations from the prescribed format on how the process needed to unfold may have serious negative effects on the learning process. Whether students knowingly or not, deviate from the prescribed protocol these changes can affect the outcome. If the facilitators then do not curb or manage these changes in order to reverse the negative impact, the learning process may be compromised (Moust, van Berkel and Schmidt, 2005).

Both observed groups did not clarify any words or concepts that they may not have understood pertaining to the case and both facilitators did not explicitly ask this from the students. Groups instead delved straight into the brainstorming and elaboration phase as the whole group. They also did not break up into buzz groups. This phenomenon was also reported by Moust, van Berkel and Schimidt (2005) where they found in their study that students tend to skip certain steps such as the brainstorming and elaboration phases of the PBL process. They argue that students may deem that they do not have the necessary knowledge or skills to effectively engage in these steps and thence jump to those steps that they feel most comfortable with and omit those they deem to not have sufficient knowledge of. Additionally, students may feel that, at that point in their training – as final year students – they do not need to go through each step as detailed out in the DLP as they have knowledge on how the PBL process needs to run. From the students' interviews, this viewpoint came out strongly, wherein students reflected that they had been doing DLPs since their first year and could therefore omit some steps and, in their opinion, not compromise the quality of the learning.

well coming from first year, PBL now for me is a more constructive exercise than it was earlier. I know that that the full point of PBL is to stimulate your learning and to make you find out about things that you've never heard about before but personally I feel I can enjoy PBL more now that I have more knowledge

(see Appendix 4.3: Student Interview)

In these observations, students attempted to define the problem or issues inherent in the case in an endeavour to construct a detailed coherent theory of the concepts and processes underpinning the cases under discussion. As intended, this aspect of the

lesson did take up most of the lesson time, with students throwing ideas around and attempting to understand the phenomena better. Both groups relied a lot on activation of prior knowledge to understand the case under discussion. Bransford, Brown and Cockling (1999) cited in Moust, van Berkel and Schmidt (2005), offer a contrary finding and argument drawing from their research. They contend that students may share the misconception that they do not possess any relevant prior knowledge to effectively engage and discuss the issues inherent in the PBL cases without the facilitator directing the discussion. This, it is reported, makes the acquisition of new knowledge less efficient. In this study however, both groups of students, though especially Group B, do demonstrate an increased understanding of the issues and concepts, drawing from their prior knowledge.

The group A facilitator is more adept at guiding the students through this mine field, and at the same time allowing the students to take ownership of the learning process. However the group B facilitator seemed to follow the facilitator guide more closely during the first lesson. He even told students that

I've got 5 big headings and we've got...; let me see if I can
give you a clue ... we've got... and I'm going to give it to you on
a plate

I'm almost ready to show the mind map

shows them the Facilitator mind map and assures them that theirs is better
(see Appendix 3.4B)

Use of lesson time

Utilisation of allocated time

The allocated classroom time was not always used to its full extent. Some classes started late, some ended early – all resulting in the utilisation of less time in comparison to the allocated two (2) hours per lesson.

Group A lasted approximately one hour thirty seven minutes at the first lesson (1417Hrs – 1550Hrs), one hour thirty five minutes during the second meeting (1401Hrs – 1536Hrs) and one hour sixteen minutes at the plenary (1407Hrs – 1523Hrs).

Group B ran for approximately forty three minutes at the initial small group meeting; from 1414Hrs until 1457Hrs, one hour and thirty two minutes during the second meeting (from 1402Hrs until 1534Hrs) and the plenary session ran for one hour fifty minutes (1407Hrs until 1558Hrs). This was less the stipulated scheduled two hours per meeting. The first meeting, which is meant to occupy much of the time, was surprisingly the shortest of all the lessons. The first lesson is meant to last long as issues raised through activation of prior knowledge need to be debated by the students.

It is clear that both groups did not utilise all the allocated time for the lessons, instead they fall short. Possible explanations may be that students rushed through the process in order to finish quickly. Facilitators may also have hastened the process. There may also have been constructive engagement with the learning issues resulting in effective use of the allocated time. It may additionally mean that students had not prepared adequately for the lessons and therefore ran out of matters to discuss. This phenomenon was reported by Moust, van Berkel and Schmidt (2005). The implication for this may be that deep engagement of the learning issues as well as self - study time are compromised and therefore ownership of the learning process by the students may be negatively affected.

During the follow – up interview with Dave, he reported that he was satisfied with the group's engagement with the issues. He reiterated the assertion that

as long as the students are able to come up with most of the learning issues during the first session, I am not fussy with whether they spend the allocated two hours or not

This phenomenon is reported by Moust, van Berkel and Schmidt (2005) and they contend that this may lead to ‘watering down of the processes’ which may impact negatively on the small group learning value for the students through the tutorial group not achieving its ‘surplus value’ for the learning processes. This may not be the case in the groups under observation in this study, as reported by Prof. Tamlin, wherein the priority with the facilitator is the group deriving the prescribed learning objectives and the non – reliance on staying the prescribed length of time for each classroom session.

Another argument that may be raised from this observation is with respect to the self – study time students undertook. Although students were not asked explicitly during the follow – up interviews, they did offer an explanation that

... with Pros for example if like as we said if you have positive feedback it builds your interest and next time you’ll want to show that you’ve got it and have learnt the work. But you know uh if whereas if the lecturer or supervisor was negative about it you gonna be as quiet as you can in that session.

You’re not gonna ask questions

Yeah, you’re just gonna like you know uh do what you need to do, but you’ll be as quiet as possible, you won’t ask any questions and you’ll just want to make sure that your work, hoping that they’re gonna say: OK it’s fine, you know and get finished as quick as possible. Whereas with the positive feedback even if it’s wrong, they’ll tell you that you need to correct this and you’ll be like: Ok you go back, go correct it and then you take it back to them, and when it’s correct at the end of the session right you’ll still discuss it with them. Think OK yeah, that was more, this is what I did right, why didn’t it work, whereas if they’re negative about it, the minute they say it’s right: that’s it; you pack up, dismiss the patient and gone!

You learn more in the other way

You’re more interested

You’re not so scared you’re gonna stuff up

And everything works better

I find if I’m relaxed and if the supervisor is relaxed then I’m not saying that they must become you know easy on you and let standards drop, but it’s just the way in which we interact. Because students in themselves probably have a, you know they don’t think they’re doing well and just that bit of motivation will improve their work

(see Appendix 4.5)

Students reported that their learning styles or motivation is greatly influenced by the teacher's interest in their work (Parker and Deacon, 2006; Victoroff and Hogan, 2006). As evident in the above excerpt of their interviews, it is clear that they report that they are keen to show knowledge with Faculty who are supportive and encouraging whereas, they use as little time as possible with those Faculty who do not demonstrate a keen interest in their learning. This is also borne out in several studies (Henzi, Davis, Jasinevicius and Hendricson, 2006; 2007; Henzi, Davis, Jasinevicius, Cintron and Isaacs, 2005). This may therefore impact on how they utilise their time during the actual lessons. One can proffer that maybe by using as little time as possible during the lessons under observation, they were not motivated by the facilitator(s)?

This reported perception by the students is supported by Prosser (2004: 56), who argues that

it is not the way that we design our courses and programmes of study in higher education that relates to the quality of student learning, but how our students experience and understand that design

He goes on further to report that students adopt qualitatively different approaches to their studies, depending on their prior experiences as well as the particular context in which they find themselves. From the student interviews, it was verified that how they learn is influenced by how they perceive their own learning. Therefore it is not the course design per se that automatically impacts on student learning, rather how students locate themselves within this community of practice. Students are also reported to vary their approaches to study within and between courses. They therefore do not adopt one approach to all programmes or to one programme all the time. This finding therefore makes it imperative for programme teachers to be sensitive to this and maintain relevance in their teaching styles and approaches. It also calls upon teachers to provide students with substantially more support in developing their own understanding of what problem –

based learning is about (Prosser, 2004). Students therefore need to be constantly and early on in their studies, enabled to develop sophisticated understanding of their learning outcomes in order to support and enhance the learning process (Kieser, Herbison, Waddle, Kardos and Innes, 2006).

Facilitation Style

Evident during the classroom observations of the second lesson was the observation that with Group A, within thirty minutes of the lesson commencing, the facilitator dictated the process by taking up much of the discussion and giving what came across as ‘a mini – lecture’. This part of the lesson took a considerable amount of the lesson – forty two minutes. On reflection, this was prompted by the observation wherein the discussion reached a point where it seemed to lack integration and contextualisation of information. The students were observed to report on the ‘bare’ facts and did not attempt to relate these to the actual case under discussion

The discussion seems to lack integration and contextualisation of information gathered. Students report on the ‘bare’ facts and do not attempt to relate them to the actual case under discussion; discussions are too global.

There also seems to be a lack of direction on how to run the lessons. This is evidenced by the fact that, a good twenty (20) minutes into the lesson, a student suggests how the lesson should be conducted. They may have been thrown out by the presence of a different facilitator in the middle of the case, even though they had been forewarned about this eventuality at the beginning of the case. The Facilitator then takes over the lesson and gives a ‘mini lecture explaining the important features and issues with respect to the case under discussion. She explains what issues to look out for in such cases. She also explains how radiographic evidence or aides enhance the diagnostic process. Other points she raises are with regard to the use of removable appliances and the different designs with the associated components

(see Appendix 3.2A: 2nd lesson observation at around 1428Hrs)

As reported by Moust, van Berkel and Schmidt (2005), Dr Boitumelo seemed focused on ‘covering the content’. Instead of allowing the students to become more self – directed and self – responsible learners, the facilitator took over the lesson, turning it into a ‘mini lecture’. The lesson at that point was not process driven, instead it focused on the

‘content’. This could be contrasted from Prof Tamblin’s facilitation style, wherein, instead of ‘taking over’ the learning, he asked ‘facilitative’ questions to prompt students whenever he felt the discussions were losing direction or lacked focus.

There also seemed to be lack of direction on how to conduct the lessons, from the students’ side. This was borne out by a suggestion from one of the students a considerable period into the start of the lesson, on how to conduct the lesson. It is hypothesised that they may have been thrown out by the presence of a different facilitator in the middle of the case, even though they had been forewarned about this eventuality at the beginning of the case.

As evidenced during the second lesson (the report back session), the nature of the lesson demonstrated a subtle change, where with Group A the facilitator took up much of the lesson to make it more lecturer - centred than student - centred. However, during the earlier aspect of the lesson when the students reported back on the variously researched learning areas, they each utilised the time well and offered well researched topics on the learning areas that had been identified., albeit failing to relate the specifics of the extra information to the case under discussion and keeping the reporting ‘global’.

Delivery of content information was partially contextualised, in both groups, to the case under discussion in each groups’ report back sessions. However, this was assisted by the facilitators in an attempt to integrate the information that students brought back to the lesson. The students’ reporting back of the issues, though attempting to integrate and contextualise the information, resulted in more of a stilted reporting manner. Students were observed to be less adept at integrating and contextualising the information to the case under discussion.

On the manner in which the lessons were to be conducted, Group B clearly defined how it would run the lesson at the start of the lesson. The student who chaired the

lesson obtained affirmation from the rest of the group at the beginning of the lesson, before any discussion ensued regarding issues that students researched on. Group A on the other hand, started off with an attempt by the facilitator to slowly 'ease' the students into the discussion by asking them outright

... did you enjoy the case?...
(see Appendix 3.2A)

There was no demonstrable introduction at the start of the lesson instead the facilitator asked the question above. This is contrasted in Group B wherein the students assigned to chair the lesson clearly defined how the lesson was to run.

1402
Dave walks in and jokingly says: 'Sorry I'm early guys' and with that he hands over the process to Verushka to start the report back session. Verushka then proceeds to explain how the session will be conducted and gets affirmation from the rest of the group about the process to they will follow.
(see Appendix 3.5B)

This introduction by the chair followed the facilitator's apology with regard to his tardiness right at the beginning of the lesson. This is normal accepted professional behaviour. The facilitator also, early on in the discussion, contextualised the learning process and brought in an element of autobiography in this regard, to explain phenomena that were discussed.

1404
When Sue finishes off her presentation, Dave requests to ask a question, asking for clarity on a point raised during the presentation. Sue answers the question. Following this Dave uses this opportunity to introduce the concept of APPROPRIOTECH to the discussion to contextualise what has just been presented. He goes further to explain what he is involved in regarding the Delphi Questionnaire and brings the relevance of this to the learning issue just discussed. He emphasises the need for the students to keep the learning real and always bearing in mind the circumstances that they work in.
(see Appendix 3.5B)

The student chair of Group A, also explained what the agreement was following the initial discussions on how the process was to be run and he then took ownership of the process by directing which student would present on the relevant topics. All this happened eight (8) minutes within the official beginning of the lesson. Contrast this with Group B's process where with the latter group, the discussion and ownership of the process / lesson commenced three (3) minutes following the official start of the lesson. In this regard, it can therefore be argued that the latter group demonstrated more effective utilisation of the lesson time at the commencement of the lesson, compared with Group A.

Both groups demonstrated a mix regarding the style of reporting – with some reading off prepared scripts, others using the notes as prompters and some actually explaining (without reference to any notes) the phenomenon or issues that they had researched further, demonstrating some heightened degree of understanding of the issues being reported on.

Ten minutes into the students' report back, Group A's discussions demonstrated a lack of focus and some degree of confusion crept into the discussion, to an extent that one of the students (Graham) asked for clarity on how the discussion was meant to ensue. It also came across as if there was a lack of integration of the issues under discussion and lack of relevant contextualisation of such issues. There was a perceivable element of lack of direction offered by the facilitator in directing the discussions and offering support to the students' discussion. This may have 'thrown off' the students and left them 'rudderless'. This was in contrast to the first lesson where the facilitator was 'facilitative' and supported the students' discussions without being directive. The facilitator during the first lesson demonstrated a 'guiding approach' especially during instances when it seemed as if the students were losing track and may have been veering off course with the discussion. It became quite clear, twenty minutes from the start of the student discussion during the second lesson, that the group discussion had lost focus, when the facilitator asked them if they knew why a certain diagnostic tool had been provided or requested in the clinical management of

the case. This was discernable in the direct answer given by the students and the nervous laughter that accompanied the response.

1424 - 1437

Dr Boitumelo interjects and asks the group why they think the Lateral Cephalograph was provided in this case.

The students collectively answer that 'we don't know' and follow this with what sounds like embarrassed laughter

Dr Boitumelo then gives an explanation of the important features and issues with respect to the case under discussion. This turns into a mini-lecture on what issues to look out for in such cases.

(see Appendix 3.2A)

There is a mix of facilitation style used throughout both groups. As noted in the earlier sections, facilitators moved between a student - centred approach to a lecturer driven lesson mode quite seamlessly. The lecturer driven approach was adopted mainly by the facilitator in Group A during the report back session in an attempt to integrate the information and reinforce the objectives of the case under discussion.

The facilitator in the second group demonstrated the adoption of a lecturer centred approach and also tended to be more directive. He informed the students early on that he would give them the facilitator mind map. This act may be construed as counter - productive to student exploration of issues and may have discouraged the students to put a lot of effort in the research aspect of the case as they knew that they would get a copy of the facilitator guide, which contained all content knowledge inherent to the case. This undertaking therefore may also be counter – productive to the principle of student driven information gathering and synthesis as it does not encourage students to take ownership of the lesson process, instead focuses them to be reliant on information that facilitators give to direct the learning.

The facilitator in Group B had the ability to effectively direct the students on non-core issues such as language use which was gender sensitive. He did this mid – sentence whilst the student was presenting. He did not wait for the student to finish that aspect of the presentation before interrupting and drawing the group's attention to

the fact. This feedback was effectively internalised by the student who then became more gender sensitive with respect to the language used.

Group Dynamic

The following characteristics were sought during the observations of the lessons, as reflected in the PBL principles (see Chapter 5)

- i) learner centeredness
- ii) participation and ownership
- iii) efficacy of the facilitation

in order to adjudicate how effective the uptake of the PBL philosophy was operationalised during the small group lessons by both groups of students and the assigned facilitators (Rudduck, 1978). Below is further analysis of what transpired in addressing the questions raised for the study.

The Group A student chairperson reinforced the principles of the PBL philosophy at the start of the process. The way in which the lessons were to unfold was clearly explained. Students were given an element of ownership of the process in a way that was not directive, but facilitative. The first facilitator (Prof Tamblin) guided the discussion effectively especially during the lulls in the student discussions and did not take ownership of the lesson. There was an attempt to ‘encode for specificity’ through the facilitator continually reinforcing the fact that the case under discussion had been treated by a staff member that the participants had known as one of their teachers (Tulving and Thompson, 1973).

In lessons that Group B held, though seeming chaotic throughout, on closer analysis conform to the format of the PBL process more closely and most of the decision making was driven by the students. The Facilitator (Dave) demonstrated a facilitative

language – both through his verbal and non-verbal actions. Even though at certain instances as observed during the lessons, he seemed not engaged with the discussions, he interjected constructively and did not offer comments that did not add value to the discussion. He actively drew all student participants to participate in discussions. Contrast this from Group A wherein a student was left out during the ‘clearing’ process and none of the students, nor the facilitator seemed aware of this omission.

The alternate facilitator’s (Dr Boitumelo) style traversed both paradigms where, when a lull occurred during the discussion, she took over and drove the discussion in a ‘lecture’ type, teacher directed mode. However, when discussion flowed, driven by the students, she let the process run and did not take over the discussions then.

The chairperson in Group B was observed to be a bit authoritarian as at times, she did not allow for engagement with issues or concerns raised by the other participants. Those raising issues were usually not given an opportunity to have these addressed. The Chair instead carried on with the process as if no issues or concern had been raised on several occasions, especially during the first meeting.

1429

Having exhausted the discussion on AGE, the group takes up Fatima’s suggestion of FINANCIALS and suggests that they break this up into several aspects. This suggestion is dismissed outright by Verushka without offering any reasons for doing so, and no one in the group asks her for an explanation for her outright refusal towards Fatima’s suggestion.

Nicky reminds them that UNEMPLOYMENT will affect a persons’ FINANCIAL status, and Priscilla adds that what one’s OCCUPATION is will also impact on all these aspects.

Verushka asks them:

‘are you happy with SOCIOECONOMIC?’

and even though Nicky answers to the negative, Verushka does not take her concern up and offer (or at least ask any other member of the group) clarity to help Nicky understand it better.

(see Appendix 3.4B)

This may not bode well for group dynamic and may cause resentment amongst the participants. Another observation was that, even though participants in Group B came out with topics / issues to discuss, this did not happen to a great extent, points were raised and not debated, instead the group was urged to move on by the chair following minimal or no discussion of the point(s) raised. This forms a clear indication of the complexity involved with small groups and small group teaching (Mennin, 2007; Mennin and Kaufman, 1989).

With Group A on the other hand, the chairperson of the group had a participatory outlook, where he was aware of which student had not contributed and attempted to bring them into the discussions by directly asking for their inputs and taking note of those inputs once given.

At this point Stavros asks Patrice (who has not contributed much to the discussion so far)

What do you think?

(see Appendix 3.1A)

Both groups did have elements of a student - centred approach wherein the students, on the main, drove the discussions and brought out the major issues and concepts to be considered. As stated earlier both facilitators brought different elements of facilitation styles to the PBL session depending on the flow and quality of the discussions. At times, both facilitators were directive, and at other times facilitative.

Research into facilitator skills has shown that a facilitator with good facilitation skills is perceived to contribute more positively to the discussions; to stimulate elaboration and knowledge integration and effectively direct the learning process and promote interaction and individual accountability from and by the students (De Grave,

Dolmans and Van der Vleuten, 1998; Bochner, Badovina, Howell and Karimbux, 2002).

Both groups seemed to own the process and took ownership of the learning process effectively, even though at times gaps in the knowledge base did become apparent, especially pertaining to the ability to critically reason some of the clinical concepts.

Understanding that one of the assumed principles in a PBL influenced curriculum is discussions that ensue during the case discussion and problem solving tasks, discussion in the small group lessons therefore play a central role in stimulating student learning. It can further be assumed that the quality of the discussion influences student learning (Nieminen, Sauri and Lonka, 2006). Studies have demonstrated that well - functioning groups increase students' commitment to learning and this may enhance group attendance and study process. It has also been argued that it may influence students to invest more time and resources on independent study (van Berkel and Schimdt, 2000). To a large extent, therefore, the students' contribution to the success of the tutorial group is important.

All in all, the PBL principles were realised during the small group lessons with both facilitators and students adhering to some degree to how the PBL process should run. The facilitators brought different styles to the lessons and the more experienced facilitator adhered more closely to the process when compared to the less experienced facilitators.

In responding to the second research question

What, if any, issues emerge during the observation phase emphasis was placed on how students responded to the learning experience and whether there was evidence of knowledge synthesis and integration by the students. The prosthodontic plan was matched against the lesson observations and information / data obtained from both students and staff interviews.

Application of the learning experience

Following on studies that have reported on conditions that foster human learning, the aspects below were focused on during the study:

i) Relevance and contextualisation of the learning experience

Activation of prior knowledge by the students was evident, especially during the first lessons of each DLP. Students drew on their knowledge from the previous years of study as well as from all relevant disciplines to try and solve the problem at hand. They did not rely on knowledge from one discipline. Discussions around issues from oral biology, orthodontics, maxillo facial and oral surgery, pathology, prosthodontics, restorative dentistry, to name a few, were used to inform the discussion in helping formulate the learning objectives that had to be looked into further.

As final year dental students, it was also clear that they showed more informed knowledge as they possessed more prior knowledge to enable them to process new information more easily (Schmidt, 1983; Mertens, 2005). PBL pedagogy, as an instructional method, has been reported to foster better and appropriate activation of relevant prior knowledge and thereby assist students in activating relevant knowledge that would facilitate the processing of new information.

The concept of ‘encoding for specificity’ was evident, especially with Group A wherein the facilitator prompted students by giving them retrieval cues that went some way in assisting students to reactivate information that they may have had by informing them on the specificity of the case under discussion

This is an interesting case, which was treated by Dr Patel. Do you all remember her – she was a registrar in the department?

(see Appendix 3.1A)

This information may have prompted the students to think along the lines of the speciality that Dr. Patel was pursuing (prosthodontics) and therefore helped inform the discussion that ensued. Furthermore, students were given the opportunity to elaborate on their knowledge. Most of the time spent during the first lesson was on this specific aspect of the learning process. This was done by students discussing the subject matter to be learnt with other students in the group (Anderson and Biddle, 1975 cited in Schmidt, 1983). Elaboration of information was also conducted via several ways, such as answering questions posed by the facilitators during the lessons and taking notes during the discussions, to name a couple of examples. It is reported that

...when students try to explain problems (under discussion) by hypothesising possible processes responsible for the phenomenon observed, they are not merely reproducing knowledge acquired at some point in the past. They are using this knowledge as “stuff for thinking”. In doing so, previously unrelated concepts become connected in memory, newly produced insights change the structure of their cognition, and information supplied by peers is added...

(see Schmidt, 1983)

All the above concepts attempt to optimise the learning by assisting students to activate relevant prior knowledge, providing context(s) that resemble the real life situation as closely as possible and stimulate students to elaborate on their knowledge (Murphy, Gray, Straja and Bogert, 2004). The DLP case attempted to address all these aspects by using a real case that was managed by faculty and the problems that

students had to address were related to real life situations wherein they had to formulate treatment plans that addressed situations that they found themselves working under where patients from different socio-economic situations sought dental intervention as well as, following completion of the course, they would find themselves working under.

ii) Wait time

Especially evident with Group B, wait time between the asking of a question and the provision of an answer was an issue. In most instances, the student chairing the lesson did not allow for sufficient time for this process. Questions were left unanswered following being asked by other students. Concepts were not probed deeply enough. As noted at the end of observing the first lesson of Group B:

... Not a particularly enjoyable session to observe – issues were not thoroughly debated; instead just came out with issues and moved to next heading...

(see Appendix 3.4B)

However, the students did bring out the main headings for discussion even though there was no extensive elaboration of the issues as the researcher may have liked.

As reported by Behar-Horenstein, Mitchell and Dolan (2005), facilitators tend to deliver content – based information without pause. A brief description of this is evidenced during discussion with Group A below:

Dr Boitumelo explains and alerts the group to the issue of orthodontic treatment (and specifically mentions that it is stated in this scenario). She leads them to start thinking about involving orthodontic specialists and the value of teamwork (including other specialists) especially regarding the timing of treatment and different procedures. She explains the reasons for the need for teamwork.

She asks the group why they thought that implant supported prostheses were the best option (as stated by Stavros earlier) and passed a joke about 'titanium deficiency'. ...she queries the biological price inherent with the desired option. She has to explain

and give answers to her questions.

(see Appendix 3.2A)

There was minimal observed evidence of an attempt to consider ways of promoting students' ability to come up with this information by themselves at this stage. Behar-Horenstein, Mitchell and Dolan (2005) suggest that 'the one minute paper' strategy could be utilised to assist this process. This involves the teacher asking students to provide a written summary of the main points that have been discussed to that point; respond to a question and wait for it to be answered (by the students); or apply a concept that they have learnt during the lesson. During the observed lessons, even though questions were asked, especially during the report back sessions, they were not answered effectively, hence leading the facilitator to give the answers themselves or delve into a 'lecture' mode in order to deliver the 'content'.

iii) Use of media

PowerPoint presentation was the preferred mode of media used during the class presentations by the students. Key points were outlined on the slides and students also used prepared notes to augment their reports. Media was used in a non - dynamic manner making the presentations somewhat dull. However, most of the content was covered on the slides and during the verbal presentations.

Extrapolating from literature espousing characteristics of effective classroom teachers, presenters who are seen to be energetic and interact directly with the audience are perceived to create a better environment for the retention of knowledge than those presenters who are not (Jahangiri and Mucciolo, 2007). A few students during the plenary sessions did attempt to draw the other students into the presentation by asking questions and using examples that they had encountered during their clinical training

Maria then starts giving real examples using her own clinical experience

to explain points and explains how she handled such patients in terms of calming the patients to enable her to carry out the proposed dental treatment:

‘I talked using a soft, reassuring and calming voice’.

(see Appendix 3.6B)

Xavier, standing by the podium, then introduces the topic he will present on: SOCIOECONOMIC.... Xavier asks the class:

‘what would you guys say with regards to who sees dentists more?’

(see Appendix 3.6B)

Curricular innovation that is reported to be extensively incorporated into oral health teaching is the increased use of computer technology (Kassebaum, Hendricson, Taft and Haden, 2004). This is in line with keeping abreast of technological innovation and its application in the classroom. The facilitators did stipulate that electronic / digital media was to be employed during the plenary session where the small groups were to present the learning issues researched and answer the questions raised by the DLPs.

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Beverley’s group then presents and Prof Andressen informs the class that the presentation will be a power point one.

(see Appendix 3.3A)

This was one aspect of curricular innovation which had been keenly taken up by the prosthodontic department. The department, during the year of the study, introduced electronic books (i-books) to augment the teaching methods. This emerged as an issue during the student interviews, where students reported that, in as much as this was meant to facilitate their learning, it did not live up to expectation as most of the students did not have the necessary software on their private computers to enable easy accessing of the learning material. It therefore meant that they could only access the learning material when on site, using the institution’s computerware.

And the i-book, the provision of the i-book, did that help?

That had lots of pictures and stuff

But in terms of doing it on your own weren't those helpful or did you ever refer to them when you were doing it alone, for the pictures?

We don't have the computers programme, like you can't get the pictures out in your room

But those pictures really helped us in the lessons though

If you probably know that OK tomorrow I'm going to do this, you might go through it to see exactly how the procedure is being done and in that way it helps you the following day if you have any hiccups or whatever

Ok and in terms of the lack of computers or the provision of computers to view the modules, did it ever occur to any of you to maybe talk with the course coordinator to provide a departmental or school computer?

Well, like we thought they will put it on the disk for people who asked, but I think it was forgotten

If the class had more like, more visual access to the computers programme

If you have a computer next to you like this, it is fantastic

(see Appendix 4.5 – Student Interviews)

Even though the use of media within the prosthodontic curriculum was not explicitly stated in the prosthodontic plan, during department workshops, meetings and discussions, this was one of the key innovations that the Department of Prosthodontics introduced in its curriculum in the use of e-learning through i-books. These were used during the preclinical techniques courses, especially with the Fixed Prosthodontics part of the curriculum. There was extensive encouragement from the Head of the Department for staff within the department to actively use media when developing teaching aids and with the delivery of lessons.

Emphasis on integration of the information or content knowledge

Synthesis and integration

It was reported in the earlier part of this chapter that observational data reflected a 'patchy' mode of information integration demonstrated by the students, leading the

facilitators in both groups to adopt a directive teacher - centred approach during certain aspects of the discussions. Students demonstrated an ability to find the facts on the learning issues that had been identified during the first lesson, however, they lacked the ability to effectively integrate the facts to the specific case under discussion and therefore could not contextualise the content detail.

Discussion of issues not integrated and following a question and answer mode with the staff present dominating most of the talking and taking over certain points and making them into mini lectures. Not allowing students to develop their reasoning / justification of issues they raise.

Prof Tamblin only facilitator seeming to facilitate discussion from the class and pointing them to issues that they seem to miss out and trying to provide an integrating thread to the student discussion – otherwise Profs Lizzard and Andressen ‘giving’ students the information and not letting students bring out the issues themselves.

(see Appendix 3.3A)

Critical reasoning and problem solving ability is mandatory to all health care clinicians and students. Critical thinking, as defined by the American Philosophical Association Delphi Report (1990) cited by Facione and Facione (2008: 128) is

...the process of purposeful, self – regulatory judgment. The process giving reasoned consideration to evidence, contexts, conceptualisations, methods and criteria

Critical thinking, is an educational outcome that has become pervasive in educational mandates both from the training institutions and professional councils regulating health care professionals or their associated credentialing bodies (HPCSA, 2006).

These institutions require all healthcare professionals to have critical clinical reasoning skills to enable excellence in professional judgment ability. This was one of the critical issues informing the curriculum innovation implemented at the institution that this study was undertaken. The lesson observations looked for the students’ ability to link discussions to concepts and the case under discussion, as well as how they developed the rationale underpinning the discussions. This would therefore demonstrate the students’ ability to critically reason the clinical cases drawing on the available evidence, literature, contexts and objectives set for each case. As Facione and Facione (2008: 130) aptly put it

...critical thinking is (a) process we use to make a judgment about what to believe and what to do about the symptoms (evidence) our patients present for diagnosis and treatment.

They argue that in order to arrive at a judgement of what to believe and what to do we need to consider the unique character of the evidence (symptoms) in view of the context (patient's current health and life circumstances) using the

...knowledge and skills acquired over the course of our health sciences training and practice (methods, conceptualisations)...

and anticipate the likely effects of the outcome (consideration of evidence and criteria) and finally monitor the progress of care delivered (evidence and criteria).

This process thus needs adequate time to think and some degree of expert knowledge in the field under discussion or observation. It was previously thought that students would somehow naturally advance in their clinical reasoning as they were introduced to clinical case scenarios. However, there is a body of literature to suggest that this is not so (Facione and Facione, 2008; Patel, Arocha, Chanhari, Karlin and Briedis, 2005) and that there need be well structured formal programmes and teaching and learning activities that foster clinical reasoning and critical thinking. Modern pedagogical approaches such as problem based learning have to a degree demonstrated that these skills can be taught and learnt. It is also imperative that clinical teachers, facilitators and mentors can facilitate reflective problem solving by prompting meta analysis and evaluation of clinical reasoning through how they teach and assess the learning and teaching practices. Pedagogical approaches that look at effectively inculcating and improving critical reasoning skills in students and clinicians alike have evidence supporting them (Facione and Facione, 2008).

From the lessons observations, it is clear that the students possess limited ability to critically reason and evaluate information that they are given. Most of the discussions raised by the students were 'global' (Moust, van Berkel and Schmidt, 2005).

Questions raised were not answered, the process of brainstorming and elaboration were undertaken in less the stipulated and allocated time, resulting in what came across as ‘patchy’ discussions lacking substance and relevance to the cases that were under discussion.

Students reported that they appreciated the relevance of the PBL cases in the final year of study as they ‘encoded for specificity’ and therefore could make sense of the knowledge gained from the discipline. They also reported that most of what they were learning made sense as applied via the PBL cases

...coming from first year, PBL now for me is a more constructive exercise than it was earlier. I know that the full point of PBL is to stimulate your learning and to make you find out about things that you’ve never heard about before but personally I feel I can enjoy PBL more now that I have more knowledge
(see Appendix 4.3 – Student Interviews)

Emergent Issues

In the discussion to follow, focus will be placed on issues that emerged during the interview phase of the data collection. In as much as some of the issues were external to the programme being evaluated, they were deemed to have an impact on the prosthodontic course. These issues were brought to the department’s notice during reflection of the study findings at various platforms including, but not limited to departmental meetings, workshops, informal discussions with staff members, report – back to the head of department with regard to the progress of the study.

During student interviews several issues emerged which had not been apparent during the lesson observations. Chief amongst these were:

- Increased stress levels due to the perceived intensity of the prosthodontic programme

- Lack of resources to support students during both the clinical and didactic aspect of the course
- Assessment fatigue and its impact on other aspects of the course – students choosing to prioritise what subjects to study in order to not fail the major courses
- Facilitator expertise with regard to supporting student learning
- The fact that certain departments did not have detailed assessment schedules and therefore decided without consulting students when to give tests. These were reported to have been given without much notice and usually during the latter part of the year, hence stressing students who would have been preparing for their final examinations.
- Another issue that students reported was departments missing their own stipulated assessment dates as outlined in the year book
- Remedial assessments had to be offered to students in the prosthodontic course, which were not stipulated and scheduled in the year book. This was a glaring mismatch between the instructional system and what was realised.
- Students reported that they felt that their issues were not listened to in formalised structures such as EDUCOM and therefore ended up not attending the meetings. A critical point that was raised was with regard to clinical issues. They reported that EDUCOM advised them the structure only dealt with curriculum issues and could not assist them with any clinical problems. This left students feeling confused. It was also contrary to data obtained from staff who reported that the structure was effective in addressing student concerns. The feeling, from staff interviewed, was that EDUCOM was the only structure which allowed students space to air their issues in a safe space without letting students feel disempowered.
- One critical issue that came out was the feeling of victimisation reported by some students. They felt that they were not empowered enough to create their own spaces within the programme in order to have a voice, as underpinned by the tenets of problem based learning. It therefore becomes imperative for teachers to be highly cognisant of such feelings and attempt to dispel such

notions by reassuring students and building learning communities which could assist in this regard.

It was reported from interviews with students that the Prosthodontic programme was well structured and organised. At the start of the programme students were each given a copy of the programme for the year outlining in detail all they needed to know with regard to the course – how they were going to be assessed; what the tutorial and didactic programme was going to discuss; what the clinical requirements for the year were etc. The various detail regarding when assessments were to be held and what type of assessment they would undertake were clearly defined in the document that was handed out to students and they reported a degree of lessened stress because of this information. However, other factors outside of the prosthodontic programme imposed stresses on the whole – for instance the total number of assessments that students had to sit for during the year and the intensity of the whole dental programme was deemed to negatively affect the students in terms of their enjoyment of the course and how they therefore approached their learning overall.

...I've got to say that uh the Prosthodontic Course is most definitely the most challenging course that I've ever done. I think it's almost a credit to the way that it is run uh in that it is so thorough. They make sure that every student gets a uh everything thoroughly, completed and all the requirements are clearly outlined in the Year Book...
(see Appendix 4.6 – Student Interviews)

RECOMMENDATIONS

The above issues were brought to the attention of the department and the programme was refined, resources permitting, to address the issues. Some of the ways in which the department refined the prosthodontic plan are outlined below:

- The pedagogy adopted and reinforced for the teaching practices were to be more aligned to contemporary methodology – PBL – with emphasis on

explicitly reinforcing problem solving skills and encouraging critical reasoning.

- The number of assessments that the department scheduled were reduced without necessarily negatively impacting on the desired assessment outcome. The department's assessment policy was modified to address the reported 'assessment fatigue'. A critical analysis of how the department was assessing students was undertaken and more creative assessment tools were implemented of prosthodontics, a written sit-down test was set where students were informed beforehand on what they were to be assessed on. This was also informed by the observation that the report method resulted in a high degree of 'cut and paste' reports without a demonstrable understanding of the concepts been assessed
- The practical assessments were modified and made clinically relevant. Previously, students had to undertake these under clinical simulated scenarios. Students had to undertake these assessments on real patients, during their scheduled clinical lessons. Both students and staff reported a decreased sense of stress with the newer method and found this method more relevant and contextualised to the real world.
- The department decided to formalise the remedial assessments and include them in the instructional system. This decision was taken following feedback from students during the interviews with regard to the degree of confusion that tests that were not scheduled brought to bear. Even though this practice (remedial testing) was deemed to be to the benefit of students it transpired that its non - explicit inclusion in the prosthodontic assessment guidelines caused distress to students.
- Staff in the department were encouraged to support students in order to facilitate the learning. One method was to allow students to use departmental resources such as photocopying in order to reduce the financial cost to students, bearing in mind that students paid for notes in their tuition fees.

Shades of ‘utilisation focused evaluation’ (Patton, 2002) were evident within this study as most of the findings were brought to the attention of the department and issues that were deemed critical enough were taken up in order to refine and modify the programme accordingly. Students’ voices, through the interviews, were brought to the fray as part of the adjudication process and the evaluator’s voice was not the lone voice during this study. At the time of submission of this report therefore, any recommendations would be belated and hence do not form part of the report, suffice to note the comment above clarifying how findings from the study were fed into the programme under evaluation.

In summary, the prosthodontic plan was realised to a certain degree and what was intended within the plan was realised in terms of the teaching process and meeting the outcomes of the plan as outlined in the curriculum. Additionally, the feedback obtained during interviews with the students was taken heed of and part of it was used to refine the programme. The lesson observations demonstrated that facilitators used various teaching styles during a lesson and did not stick to one style only in order to reinforce learning and ensure knowledge integration. Students, as well, on the other hand demonstrated activation of prior knowledge and the ability to seek out relevant information to enable derivation of the required learning objectives in order to meet the learning objectives set for each lesson.