PHASE III: IMPLEMENTATION AND EVALUATION OF THE DENTAL EDUCATIONAL RESEARCH INTERVENTION THROUGH ACTION LEARNING AND -RESEARCH

CHAPTER 6 PLANNING

6.1 Introduction

This chapter describes the planning cycle of Phase III of the study - implementation and evaluation of the dental educational research intervention. The planning cycle comprises the design and a description of the pilot study conducted before commencement of the implementation cycle of Phase III of the study.

Table 27 Research strategy followed during the study

Phase of the study	Action learning and -research paradigm/cycle	Corresponding research structure
Phase III: Implementation and evaluation of the intervention through action learning and -research	Planning	Design, pilot study
	Implementation	Methodology • Subjects • Instruments • Procedures • Statistical analysis
	Observation	Results
	Reflection	Discussion
	Re-planning	Recommendations

6.2 Design

The implementation cycle of Phase III of the study was designed in a pre- and a post-training cycle comprising five steps (Figure 9, below). The rationale for this design is the following:

- A pre- and post-training cycle enables the researcher to evaluate the effect of the proposed dental educational research intervention on students' observable relational communication skills;

- In order to enhance student-centered, problem-oriented learning, the design ensures the exposure of students to an experiential learning strategy complemented by a didactic teaching strategy (Steps 1 & 3 - Figure 9). The purpose of first exposing students to an experiential learning strategy (Step 1 - Figure 9), is to stimulate students affectively - to "experience the experience" - about the nature and process of conducting an interview. As a result, students' identification with, and realisation of the importance of the theoretical evidence supporting communication skills teaching are enhanced. The evidence behind communication skills teaching, the cognitive aspects as well as the required communication skills are presented during the didactic teaching strategy (Step 3 - Figure 9). The experiential teaching strategy is repeated after the didactic teaching strategy to enable students to functionalise the acquired skills through repetitive practice (Step 4 - Figure 9);
- The purpose of the gradual approach-design by means of interviews with peers (Step 1 - Figure 9) followed by interviews with the SP (Step 4 - Figure 9), is threefold:
  - To ensure that students gain confidence and expertise in a safe and supportive environment;
  - To provide students with the opportunity to reflect on the process of relational communication skills development by experiencing the role of "dentist" and "patient", and
  - To ensure a smooth transition from interviewing a SP to interviewing real patients during students' clinical years.

- Self-evaluation and peer evaluation (Step 1 - Figure 9) followed by evaluation by the SP (Step 5 - Figure 9), will enhance students' experiential learning. Evaluation of students' communication skills by the SP (Step 5 - Figure 9) by means of the assessment rubric ensures objective, reliable and credible assessment.

Step 1	Pre-training cycle (Training cycle 1)	Experiential learning opportunity ("experience the experience")	Didactic teaching	Peers	Video recordings of 3rd year dental students' base line communication skills	Self-evaluation
Step 2					Evaluation of 3rd year dental students' base line communication skills	
Step 3		Cognitive evidence	Didactic teaching	Lecturers Videos Experiential learning/role play	Developing 3rd year dental students' communication skills by teaching	
Step 4	Post-training cycle (Training cycle 2)	Experiment/practice		Experiential learning/role play SP	Video recordings of 3rd year dental students' newly developed communication skills	
Step 5		Evaluate			Evaluation of 3rd year dental students' newly developed communication skills	Evaluation by SP

Figure 9 Design of the implementation cycle of Phase III of the study: pre- and post- training cycles

6.3 Pilot study

A pilot study was conducted with 10 fourth-year and 10 second-year students before commencement of the implementation cycle of Phase III of the study. The purpose of this pilot study was twofold:

- To evaluate the research process, the SP's use of the assessment rubric and the appropriateness of two of the instruments, namely the "Patient's" feedback and the "Dentist's" feedback. (The rationale behind the design of these questionnaires will be discussed in Chapter 7, sub-sections 7.3.3 and 7.3.4 respectively), and
- To ensure the eventual "richness" and trustworthiness of the data collected.

The pilot study confirmed the following:

- The SP experienced the rubric (Appendix A) as an appropriate and user-friendly assessment instrument;
- The questionnaire: "Patient's" feedback (Appendix E), employed as assessment instrument by the SP, complemented the rubric as assessment instruments employed by the SP, and
- The six categories of the original questionnaire: "Dentist's" feedback (Appendix F) that required open-ended, qualitative feedback was experienced as inadequate. In order to ensure "richness" and trustworthiness of data, students' open-ended, qualitative feedback needed to be enhanced by a quantitative rating scale. A qualitative data analysis process (described below) was employed to develop a quantitative rating scale to form part of the questionnaire: "Dentist's" feedback.

Through a process of qualitative data analysis, called triangulation (122) (Figure 10, below), the *originally* developed "Dentist's" feedback questionnaire (Appendix F) was converted into the *final* "Dentist's" feedback questionnaire (Appendix G). A description of the process of triangulation follows.

Six categories that required open-ended, qualitative feedback were initially selected and included in the originally developed "Dentist's" feedback questionnaire (Appendix F). These six categories were as follows:

- Communication skills' contribution to the dentist-patient relationship;
- Communication as "dentist": strong points in terms of communication;
- Aspects of communication that need further development;
- Experience of role-playing as a "dentist";
- Communication as "dentist": most enjoyable experiences, and
- Communication as "dentist": least enjoyable experiences

The 10 fourth-year and 10 second-year students who participated in the pilot study, were requested to provide feedback by means of the abovementioned categories about their experiences as "dentist" during their interviews with the SP. This feedback from the students provided a rich variety of viewpoints/inputs about the "dentist"-SP interaction.

The process of observing something from different viewpoints is called triangulation (122). There are several types of triangulation (122). Two types were used in this study:

- *Triangulation of measures* ensures that confidence in obtaining an accurate measure of the students' experiences, feelings and needs, is greater if something is measured in more than one way, and
- *Triangulation of method* means the mixing of qualitative and quantitative styles of research. The two styles of research have different, but complementary strengths. A research approach including both styles is referred to as a multi-method approach which is more comprehensive and ensures a "richness" of data. The use of multi-methods enables the researcher to synthesise or generate a theory (122).

Students' qualitative feedback to the open-ended statement: "Communications skills' contribution to the dentist-patient relationship" will be used to illustrate the application of the above description to generate a theory.

Step 1: Search for general statements: identifying the story

The process of qualitative data analysis is not a fixed linear approach, but instead the researcher moves in analytical circles – a data analysis spiral. These circular movements represent a search for general statements about relationships among categories of data – to generate a theory from the available data, called a grounded theory (122). Step 1 entails the writing, in a few sentences, the general character of the story as contained in the feedback by the students. The following sentences represent the general character of the students' feedback: 'Communication skills will ensure a trusting relationship characterised by openness. This will enhance the dentist's understanding of the patients' expectations. A personalised relationship will ensure the retention of the patient, compliance with the treatment plan as well as promotion of the practice by the patient.

Step 2: Category formation: moving from description to conceptualisation

To move from the story to the storyline: the most important feature in the story has to be given a name. Category formation represents the most important or central part of qualitative data analysis. It involves identifying five or six general themes by separating an observation, sentence or paragraph into pieces, followed by grouping concepts that seem to represents the same situation, event, idea or perception. This is called categorising.

Step 3: Name the category: making a choice between two or more relevant features

The next step following categorising is to name the category. The name should be logically related to the data it represents. Another important source of names is the words and phrases used by students themselves that immediately draw one's attention to them. These terms are called "in vivo codes" (122). Sometimes two features in the data seem to be equally important or of interest.

It is essential, however, to make a choice between them in order to achieve the tight integration and the dense development of categories required for a grounded theory (122).

Step 4: Develop the categories in terms of their characteristics and dimensions

The core category must be developed in terms of its characteristics. This resulted in the *originally* developed questionnaire: "Dentist's" feedback (Appendix F) converted into the *final* questionnaire: "Dentist's" feedback (Appendix G).

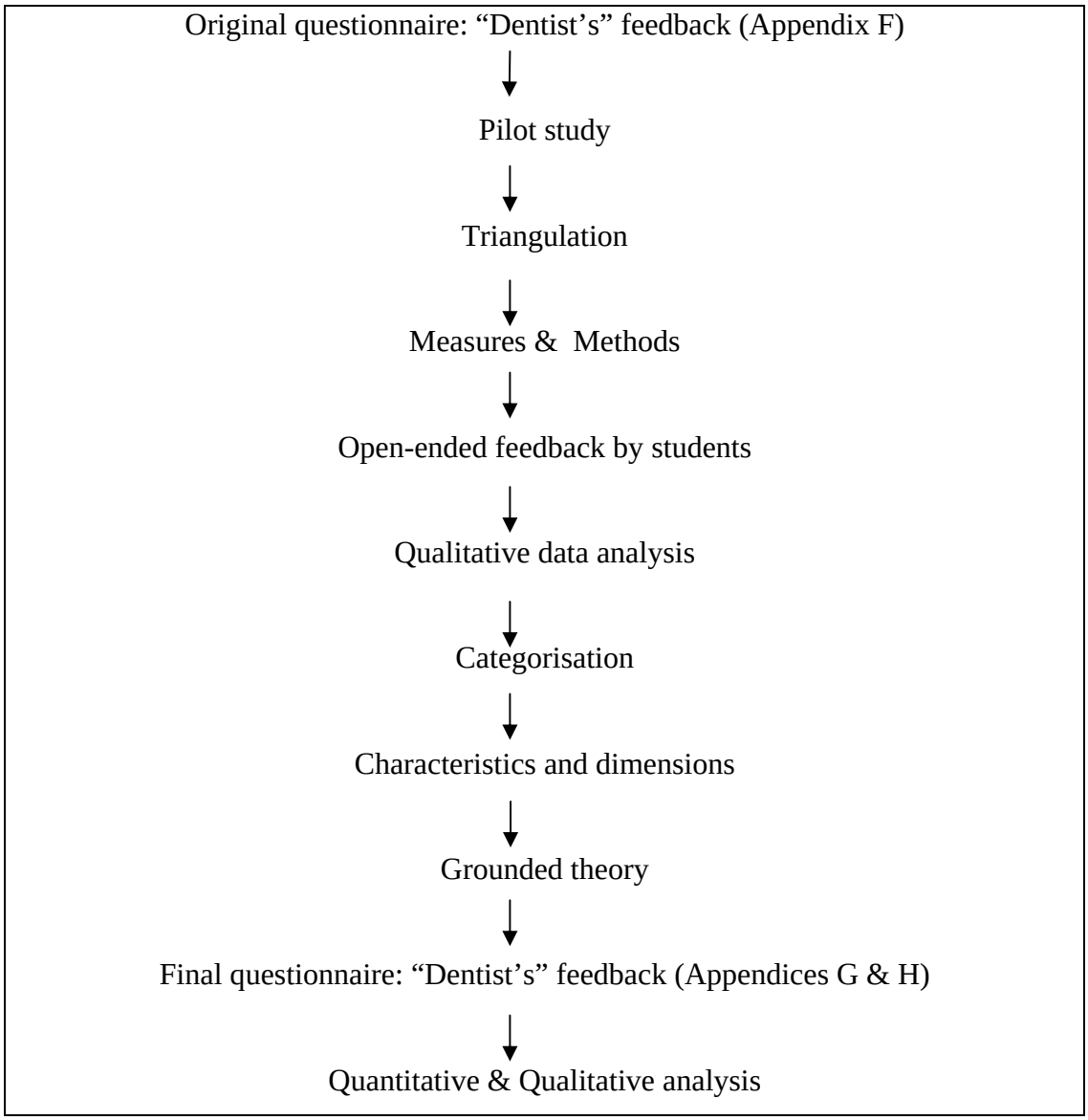

Figure 10 Process of qualitative data analysis

6.4 Conclusion

Chapter 6 described the design of, and pilot study conducted during, the planning cycle of Phase III of the study.

Chapter 7 will address the implementation cycle of Phase III of the study.

CHAPTER 7 IMPLEMENTATION

7.1 Introduction

The current chapter describes the implementation cycle of Phase III of the study for example implementation and evaluation of the dental educational research intervention. The implementation cycle can also be described as the methodology followed in implementing the dental educational research intervention (Figure 9 - Chapter 6, section 6.2). The methodology comprises the subjects, instruments, procedures and statistical analysis.

7.2 Subjects

A cohort of 67 third year dental students comprised the subjects of the study. The demographics of the subjects were as follows: the majority (n = 42; 63%) was female. 48 students (72%) were White, 12 students (18%) were African and seven students (10%) were Asian. The average age of the group was 21.8 years (male = 22.8 years; female = 21.2 years). The cohort of 67 students was divided in 16 smaller groups of four students each and one group of three students.

7.3 Instruments

7.3.1 Study guide (Appendix C)

A study guide was compiled and each student issued with a copy. The study guide was structured in the format required by the South African Qualifications Authority (SAQA) and contained the purpose (the rationale for communication skills teaching), embedded knowledge (the cognitive aspects and evidence supporting communication skills teaching), as well as assessment criteria (the communication skills required).

7.3.2 Case study (Appendix D)

A case study was developed which represented a clinical scenario comprising the full scope of bio-psychosocial skills required during the dentist-patient interview. The clinical scenario represented a patient with the following problem: a carious lesion on the right maxillary first premolar; a defective restoration on the left maxillary central incisor; a discoloured right maxillary central incisor; gingivitis and an impacted left mandibular wisdom tooth. Each student interviewed the SP using the case study.

7.3.3 "Patient's" feedback (Appendix E)

The questionnaire: "Patient's" feedback was designed to focus particularly upon the relationship between dentist and patient, patient understanding, -loyalty and -agreement (Table 2 - Chapter 1, section 1.1). The SP, as "patient", rated her experiences of the "dentist's" communication skills during her interview with each student on a five-point Likert scale (123). Likert scales are commonly used to measure attitude, providing 'a range of responses to a given question or statement' (124).

7.3.4 "Dentist's" feedback (Appendices F, G & H)

Six categories were initially selected and included in the originally developed "Dentist's" feedback questionnaire (Appendix F). The rationale for the selection of these six categories is presented in Table 28 (below). The six categories were the following:

- Communication skills' contribution to the dentist-patient relationship;
- Communication as "dentist": strong points of communication;
- Aspects of communication that need further development;
- Experience of role-playing as a "dentist";
- Communication as "dentist": most enjoyable experiences, and
- Communication as "dentist": least enjoyable experiences.

As was described in the pilot study (Chapter 6, section 6.3), the originally developed "Dentist's" feedback questionnaire (Appendix F) was converted into the final "Dentist's" feedback questionnaire (Appendix G). In order to obtain the "dentist's" feedback after video recording during step 4 of the implementation phase (Figure 9 - Chapter 6, section 6.2), the adjusted "Dentist's" feedback (Appendix G) was expanded to include quantitative- and qualitative feedback from the students about the lectures and teaching methods employed (Appendix H).

Each student provided quantitative and qualitative feedback about his/her experience as "dentist" during the interview with the SP on a five-point Likert scale and by answering open-ended questions, respectively.

Table 28 Questionnaire: "Dentist's" feedback: categories and rationale for selection

Category	Rationale for selection
Communication skills' contribution to the dentist-patient relationship	To determine students' perception of the important role of communication in the dentist-patient relationship
Communication as "dentist": strong points of communication	To allow students to reflect on their experiences of the dentist-patient interaction
Aspects of communication that need further development	To determine how students perceive their own communication skills
Experience of role-playing as a "dentist"	To allow students to reflect on their experiences of the dentist-patient interaction
Communication as "dentist": most enjoyable experiences	To determine how students perceive their own communication skills
Communication as "dentist": least enjoyable experiences	To determine how students perceive their own communication skills

7.3.5 Training of a standardised patient

A professional actress was trained as a standardised patient (SP) to portray the case study (clinical scenario) in a consistent, reproducible and measurable manner (125). To assist the SP in understanding the nature of the dental scenario and its presenting signs and symptoms, written case notes were prepared for the SP to review (Appendix D). During training of the SP, the assessment rubric (Appendix A) served to educate her about the nature of the dentist-patient interaction. The SP was provided with guided feedback as she rehearsed the desired physical and verbal responses during her interaction with the "dentist."

7.4 Procedures

The procedures employed during the implementation cycle of Phase III of the study can be divided into five steps (Figure 9 - Chapter 6, section 6.2) in order to compare students' communication skills between the pre- and post training cycles.

Step 1: Students' base line communication skills were obtained by means of video recordings of their interviews with the SP.

Step 2: Students' base line communication skills were evaluated by means of video recordings and -feedback as well as by the SP using the assessment rubric (Appendix A). As the rubric represented an example or template of the required communication skills, it was implemented and used as an assessment instrument by the SP from her observation of students' communication skills. During the feedback session immediately after the interview, the SP provided descriptive feedback to each student by means of the video recordings to demonstrate, reflect and develop his/her individual competency. The process of video reviews is a powerful and effective teaching tool providing guidance for experiential learning and reflective self-assessment (111).

Each student was rated as follows by the SP (Appendix A): “1” if the skill was not employed; “2” if the skill was partially employed; “3” if the skill was adequately employed and “4” if the skill was fully employed. This method of evaluation ensured transparency and credibility as students could see exactly what elements of communication were being assessed and how these related to their performance.

Step 3: Development of students’ communication skills through a didactic lecture, video demonstration and experiential learning strategy:

- A one-and-a-half-hour didactic lecture during which the rationale for communication skills teaching, the cognitive aspects and evidence supporting communication skills teaching, as well as the communication skills required were presented to the class as a whole;
- A video demonstration of the principles of the interview, and
- Experiential learning over a two-week period through role-playing and peer evaluation in small groups of eight students each. Each small group of eight students had access to a venue equipped with a video player and was allocated two three-hour sessions to develop their skills in terms of the dentist-patient interview.

Step 4: Students’ newly developed communication skills were obtained by means of video recordings of their interviews with the SP.

Step 5: Evaluation of students’ newly developed communication skills by means of video recordings and -feedback as well as assessment of their skills by the SP using the assessment rubric (Appendix A).

Table 29 (below) provides a summary of the instruments and procedures employed during Phase III of the study.

Table 29 Summary of the instruments and procedures employed during Phase III of the study

Date	*Procedure*	*Description of procedure*	*Instruments employed for each procedure*
January 2004	Preparatory phase		• Develop a study guide • Develop a clinical case study • Develop "Patient's" feedback questionnaire • Develop "Dentist's" feedback questionnaire • Training of a SP
February – March 2004	Obtaining students' base line communication skills	• Groups of 4 students each • Each student interviews SP • Video recording of "dentist"-SP interview	• Video recording • "Patient's" feedback (Appendix E) • "Dentist's" feedback (Appendix G)
February – March 2004	Evaluation of students' base line communication skills	• Evaluation of video recordings by: o SP o Peers o Self	• Combined rubric (Appendix A)
April 2004	Development of students' communication skills by teaching	• Class divided into groups of 8 students each • Role-playing by each group • Peer evaluation • Self-evaluation	• Combination of cognitive material, didactic methods, demonstrations, role-playing, feedback, reflection • Combined rubric (Appendix A)
May – July 2004	Obtaining students' newly developed communication skills	• Groups of 4 students each • Each student interviews SP • Video recording of "dentist"-SP interview	• Video recording • "Patient's" feedback (Appendix E) • "Dentist's" feedback (Appendix H)
May – July 2004	Evaluation of students' newly developed communication skills	• Evaluation of video recordings by: o SP o Peers o Self	• Combined rubric (Appendix A)
July – November 2004	Evaluation of the appropriateness of teaching strategy and instruments	• Statistical data analysis • Adjustment to methodology and instruments	• "Dentist's" feedback (Appendix H)

7.5 Statistical analysis

The instruments employed in the study were designed to ensure that a quantitative data analysis procedure would be supplemented by a qualitative data analysis procedure. This approach is described in the literature as a multi-method design approach (122). Employing the two methods in parallel ensures more comprehensive data and as a result, greater confidence in the results of the study (122).

The combined rubric (Table 26 - Chapter 5, section 5.2.2; Appendix A) was employed during steps 2 and 5 (Figure 9 - Chapter 6, section 6.2) of the implementation cycle of Phase III of the study to assess students' base line communication skills and newly developed communication skills, respectively. The data obtained was statistically analysed to investigate and confirm the construct validity and internal consistency of the combined rubric by means of a series of factor- and item analyses according to Eigen values and Cronbach's alpha coefficient, respectively. The series of factor- and item analyses determined which items contribute to which dimension of the rubric as well as each item's degree of contribution (loading) to a particular dimension. Each set of items' contribution to a particular dimension is a function of the inter-item correlation within a particular set of items.

Changes in students' interviewing skills were determined and measured by means of the Wilcoxon Rank Sum Test and the Signed Rank Test for training cycle 1 and 2 respectively. To determine the differences in students' performance between training cycles 1 and 2, it is necessary to mention the following: Paired data, for example Rubric for training cycle 1 versus Rubric for training cycle 2 (Table 36 - Chapter 8, section 8.2.1.4) was compared by applying the non-parametric Signed Rank Test (Wilcoxon Signed Rank Test). In effect this is comparing the mean of a pre-value (training cycle 1) to the mean of a post-value (training cycle 2) in the case of training cycles.

Scores on the original individual Likert score and composite Likert scores based on the individual scores, did contain many ties and were transformed as follows: to each of these scores a small random value was added in such a manner so as to preserve the ordering on the original Likert and composite Likert scales and to break the above-mentioned ties. These transformed scores were then used in the non-parametric statistical analysis (Wilcoxon Rank Sum Test) to compare independent groups for example gender (male versus female). This would in effect be comparing means (or medians) between groups. This was done to exclude the confounding effect of gender in the learning process since only one SP of one gender was used in the study.

A five per cent level of significance was chosen for all statistical tests.

7.6 Conclusion

Chapter 7 described the implementation cycle or methodology of Phase III of the study, comprising the subjects, instruments, procedures and statistical analysis.

Chapter 8 will address the observation cycle, or results of Phase III of the study.

CHAPTER 8 OBSERVATION

8.1 Introduction

The current chapter describes the results of the study as the observation cycle can also be described as the results obtained during Phase III of the study - the implementation and evaluation phase of the dental educational research intervention. Quantitative and qualitative data were obtained and analysed.

8.2 Quantitative data analysis

Results were obtained by means of four instruments:

- The "Rubric" that was employed by the SP as an assessment tool during training cycles* 1 & 2;
- "Patient's" feedback during training cycles 1 & 2;
- "Dentist's" feedback completed by each student after interviews with the SP during training cycle 1, and
- "Dentist's" feedback completed by each student after interviews with the SP during training cycle 2.

(* Training cycle 1 = Pre-training video recordings of students' base line communication skills; Training cycle 2 = Post-training video recordings of students' newly developed communication skills - See Figure 9 - Chapter 6, section 6.2).

The quantitative results will be presented as follows:

8.2.1 Rubric (Appendix A)

8.2.1.1 Investigation of the construct validity of the combined rubric by means of a series of factor- and item analyses according to factor loadings.

8.2.1.2 Male students compared with female students within training cycle 1.

8.2.1.3 Male students compared with female students within training cycle 2.

8.2.1.4 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.1.5 Female students during training cycle 1 compared with female students during training cycle 2.

8.2.1.6 Comparing male students with female students within training cycle 1.

8.2.1.7 Comparing male students with female students within training cycle 2.

8.2.2 "Patient's" feedback (Appendix E)

8.2.2.1 Male students compared with female students within training cycle 1.

8.2.2.2 Male students compared with female students within training cycle 2.

8.2.2.3 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.2.4 Female students during training cycle 1 compared with female students during training cycle 2.

8.2.3 "Patient's" feedback compared with Rubric

8.2.3.1 Male students during training cycle 1.

8.2.3.2 Female students during training cycle 1.

8.2.3.3 Male students during training cycle 2.

8.2.3.4 Female students during training cycle 2.

8.2.3.5 "Patient's" feedback compared with Rubric's dimensions: "Sharing information" and "Building the relationship"

8.2.4 "Patient's" feedback compared with "Dentist's" feedback

8.2.4.1 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.4.2 Female students during training cycle 1 compared with female students during training cycle 2.

8.2.5 "Dentist's" feedback (Appendices G & H)

8.2.5.1 Male students compared with female students within training cycle 1.

8.2.5.1.1 Male students compared with female students within training cycle 1 in terms of "experience as dentist."

8.2.5.1.2 Male students compared with female students within training cycle 1 in terms of "How communication skills contribute to the dentist-patient relationship in respect of …"

8.2.5.1.3 Male students compared with female students within training cycle 1 in terms of "Communication as "dentist" in respect of…"

8.2.5.1.4 Male students compared with female students within training cycle 1 in terms of "Aspects of communication that needs further development".

8.2.5.1.5 Male students compared with female students within training cycle 1 in terms of "Experience as role-playing as a "dentist".

8.2.5.1.6 Male students compared with female students within training cycle 1 in terms of "How "dentist" experienced session"

8.2.5.2 Male students compared with female students within training cycle 2.

8.2.5.2.1 Male students compared with female students within training cycle 2 in terms of "experience as dentist."

8.2.5.2.2 Male students compared with female students within training cycle 2 in terms of "How communication skills contribute to the dentist-patient relationship in respect of …"

8.2.5.2.3 Male students compared with female students within training cycle 2 in terms of "Communication as "dentist" in respect of…"

8.2.5.2.4 Male students compared with female students within training cycle 2 in terms of "Aspects of communication that needs further development"

8.2.5.2.5 Male students compared with female students within training cycle 2 in terms of "Experience as role-playing as a "dentist"

8.2.5.2.6 Male students compared with female students within training cycle 2 in terms of "How "dentist" experienced session"

8.2.5.3 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.5.4 Female students during training cycle 1 compared with female students during training cycle 2.

8.2.6 "Dentist's" feedback compared with Rubric

8.2.6.1 Statement: "I am comfortable interviewing patients" compared with the total Rubric score.

8.2.6.2 Statement: "I am comfortable interviewing patients" compared with each of the Rubric's six dimensions.

8.2.6.3 All five aspects of "experience as dentist" compared with each of the Rubric's six dimensions.

8.2.6.4 "Dentist's" feedback in terms of importance of topics addressed in lectures.

8.2.6.5 "Dentist's" feedback in terms of appropriateness of teaching methods employed.

8.2.1 Rubric (Appendix A)

8.2.1.1 Investigation of the construct validity of the combined rubric (Table 26 - Chapter 5, section 5.2.2) by means of a series of factor- and item analyses according to factor loadings.

Table 30 Factor- and item analysis of the combined rubric according to factor loadings

Variable number	Dimension	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
11	B(i)	0.70756						
43	G	0.70426						
8	A	0.66876						
34	E	0.65492						
37	F	0.64274						
28	D	0.62851						
33	E	0.62831						
26	D	0.53914						
31	E	0.53013						
12	B(ii)	0.49984						
24	C	0.49055						
27	D	0.46228						
41	G		0.80262					
46	G		0.78588					
44	G		0.75139					
40	G		0.68710					
39	G		0.64596					
45	G		0.53764					
42	G		0.47469					
17	B(ii)			0.71658				
18	B(ii)			0.70641				
15	B(ii)			0.63933				
22	C			0.63243				
16	B(ii)			0.59277				
13	B(ii)			0.53471				
14	B(ii)			0.48426				
19	C			0.43793				
35	E				0.78030			
7	A				0.65657			
32	E				0.63346			
30	E				0.60707			
29	D				0.57031			
23	C				0.49728			
21	C					0.65413		
20	C					0.61940		
36	F					0.60343		
9	B(i)					0.60204		
10	B(i)					0.59387		
25	D					0.53311		
6	A						0.87675	
4	A						0.87156	
5	A						0.76675	
38	F							0.93413

As a result of the factor- and item analysis presented in Table 30 (above), the following adjustments were made to the combined rubric:

Variable numbers 8, 11, 12, 24, 26, 27, 28, 31, 33, 34, 37, and 43 all loaded towards Factor 1 and were left unchanged.

Variable numbers 39, 40, 41, 42, 44, 45 and 46 were kept as a group as they all loaded towards Factor 2 and comprised Dimension G of the combined rubric.

The same applied to Variable numbers 7, 23, 29, 30, 32 and 35, which loaded towards factor 4, and Variable numbers 9, 10, 20, 21, 25 and 36, which loaded towards Factor 5.

Variable numbers 9, 10 and 11 comprising the original sub-dimension B (ii): "Exploration of problems", did not load towards the same factors: 9 and 10 loaded towards Factor 5, while 11 loaded towards Factor 1. They were left unchanged. As a result, sub-dimension B (i): "Structuring the consultation" was dismissed as at least three items should load towards a factor to justify a dimension's independence (126). As a result of sub-dimension B (i)'s dismissal, sub-dimension B (ii)'s viability was jeopardized and was dismissed. Sub-dimension B (i) became Dimension B and was renamed from "Gathering information" to "Structuring the interview." Sub-dimension B (ii) was incorporated in Dimension C - "Understanding the patient's perspective."

Variable numbers 13, 14, 15, 16, 17, 18 and 22 were kept as a group as they all loaded convincingly towards Factor 3 and they all comprised the original Dimension B (ii) except for variable number 22. Variable number 22 was kept as part of this group, as it loaded rather strongly - 63.24% - towards Factor 3. For the same argument, Variable number 19 was not included in this group as it's loading towards Factor 3 was rather weak - 43.79%.

Variable numbers 4, 5 & 6 were kept as a group as they all loaded towards factor 6. Variable numbers 7and 8 were separated form the original group.

Variable number 38 was dismissed, as it was the only item that loaded towards Factor 7. This resulted in the dismissal of the original Dimension: "Providing closure", as at least three items should load towards a particular factor to justify a dimension's independence (126).

During the next step, six dimensions - as opposed to the seven dimensions as proposed in the combined rubric - were selected according to Eigen values as these six dimensions explained 73.30% of the variation in the data (Table 31, below).

Table 31 Eigen values of the factors and percentage loading of each dimension

Dimension	Eigen value	Proportion (% loading)	Cumulative
1	22.67	0.5397	0.5397
2	2.82	0.0671	0.6068
3	1.85	0.0441	0.6509
4	1.29	0.0308	0.6817
5	1.19	0.0266	0.7083
6	1.04	0.0247	0.7330

Table 31 illustrates that Dimension 1 of the rubric explained 53.97% of the variation in the data; Dimension 2 explained 6.71%; Dimension 3 explained 4.41%; Dimension 4 explained 3.08%; Dimension 5 explained 2.66% and Dimension 6 explained 2.47% of the variation in the data.

A further round of item analysis was performed to confirm the adjusted structure of the rubric. The adjusted rubric comprised six dimensions as a result of the factor analysis referred to in Table 30.

A final round of factor- and item analysis was repeated to obtain an acceptable Cronbach's alpha coefficient value for each dimension of the rubric (Table 32, below). This item analysis was judged by using the values as calculated for Chronbach's alpha coefficient. The effect of final round of factor- and item analysis was that certain items were completely removed to obtain an acceptable Cronbach's alpha coefficient value for each dimension of the rubric. According to the factor analysis presented in Table 32 (below), some of the items could be grouped under more than one dimension as a result of their loadings towards more than one dimension of the rubric. Practical considerations also played a role in the final grouping of the items.

(The dimensions do not follow a chronological order as during a dentist-patient interview, but is reported as it was produced through the statistical analysis).

Table 32 Final Cronbach's alpha analysis

Dimension	Variable number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Chronbach's value (%) after adjustment
1. Reaching an agreement	11	1					
	43	1	7				
	8	1	2				
	37	1					
	28	1					
	34	1	4	2			
	33	1	4	2			
	12*	1	2	5			
	31	1	4	6			
	24	1	4	3	2		
	Chronbach's value (%) before adjustment	94.1					93.7
2. Understanding the patient's perspective	17	2					
	18	2	4				
	22	2	3				
	16	2	1	3			
	15	2	7				
	13	2	5	1			
	23	2	4				
	19	2	4	1	5	3	
	14	2	5	1			
	Chronbach's value (%) before adjustment	94.8					95.0
3. Building a relationship	41	3					
	46	3					
	44	3	1				
	40	3	5				
	39	3	5	7	2		
	45	3	1	2			
	Chronbach's value (%) before adjustment	92.9					92.8
4. Sharing information	35	4					
	7*	4	2				
	32	4					
	30	4	1	5			
	29	4	2=1	1=2			
	27	4	1	2			
	Chronbach's value (%) before adjustment	89.9					89.6

5. Structuring the interview	21	5	2				
	20	5	3				
	9	5	1				
	10	5	1				
	36*	5	1				
	25*	5	1	4			
	Chronbach's value (%) before adjustment	90.7					88.2

6. Opening the interview	6	6					
	4	6					
	5	6					
	Chronbach's value (%) before adjustment	80.7					80.7

	26*	7	1	4			
	42*	7	3	1			
	Chronbach's value (%) before adjustment	-0.84					

As a result of the final factor- and item analysis, the following adjustments were made:

- Variable number 12 - "encourages patient to give history of chief complaint" - was moved from Dimension 1 ("Reaching an agreement") to Dimension 5 ("Structuring the interview"). It is more sensible and logical to encourage the patient to give the history of the chief complaint early during the interview ("Structuring the interview") instead of towards the end the interview ("Reaching an agreement").
- Variable number 7 - "attends to patient's physical comfort" - was moved from Dimension 4 ("Sharing information") to Dimension 2 ("Understanding the patient's perspective"). The patient's comfort should be attended to as early as possible after the start of the interview.
- Variable number 36 - "Summarise session briefly" - was moved from Dimension 5 ("Structuring the interview") to Dimension 1 ("Reaching an agreement"). The session should be summarised towards the end.
- Variable number 25 - "Discusses options" - was moved from Dimension 5 ("Structuring the interview") to Dimension 4 ("Sharing information"). It is more appropriate and logical to "Discuss options" while presenting the treatment plan ("Sharing information").

- Variable number 26 - “Discusses consequences of no action” - and Variable number 42 - “Demonstrates appropriate non-verbal behaviour” - were the only two items which loaded towards dimension 7, although negative and very low (Cronbach’s alpha coefficient = - 0.84). Also, as at least three items are required to make up a dimension (126), it was decided to move Variable number 26 to Dimensions 4 (“Sharing information”) Variable number 42 to Dimension 3 (“Building the relationship”).

This resulted in the following final, *adjusted* rubric (Table 33, below; Appendix B) consisting of six dimensions (A - F) and 42 items (1 - 42) as opposed to the initial, *combined* rubric’s seven dimensions (A - G) and 43 items (1 - 43). The six dimensions of the adjusted rubric are as follows:

- Opening the interview;
- Structuring the interview (Replaced Dimension: “Gathering information” comprising “Structuring the interview” and “Exploration of problems”);
- Understanding the patient’s perspective;
- Sharing information;
- Reaching an agreement (Original Dimension: “Providing closure” incorporated here);
- Building a relationship.

Table 33 Adjusted rubric comprising six dimensions (A-F) and 42 items (1-42)

A.	**Opening the interview**
1.	Greets the patient
2.	Introduces self
3.	Obtains the patient's name
B.	**Structuring the interview**
4.	Negotiates an agenda for consultation
5.	Encourages patient to give history of chief complaint
6.	Picks up verbal cues (patient's need to contribute information/ask questions; information overload; distress)
7.	Picks up non-verbal cues (patient's need to contribute information/ask questions; information overload; distress)
8.	Progresses from one section to another using transitional statements (includes rationale for next section)
C.	**Understanding the patient's perspective**
9.	Attends to physical comfort (here and throughout interview)
10.	Determines patient's expectations regarding each problem
11.	Encourages expressions of feelings
12.	Uses open questioning technique
13.	Uses closed questioning techniques
14.	Facilitates patient's responses (use of encouragement, silence, repetition, paraphrasing, interpretation)
15.	Listens attentively (no interruptions; time for patient to think before answering)
16.	Clarifies patient's statements which are vague and need amplification
17.	Summarises at end of a specific line of inquiry to verify own interpretation of what patient has said to ensure no important data was omitted
18.	Encourages patient to contribute ideas/suggestions/preferences/beliefs
D.	**Sharing information**
19.	Provides information (procedures; processes; benefits & advantages; value & purpose)
20.	Discusses options
21.	Discusses consequences of no action
22.	Shares own thoughts; ideas/dilemmas/thought processes
23.	Elicits patient's understanding about plans and treatments
24.	Takes patient's lifestyle, beliefs, cultural background and abilities into consideration
25.	Asks about patient's support network for decision-making
E.	**Reaching an agreement on problems and plans**
26.	Attends to timing
27.	Reading, writing, use of computer do not interfere with dialogue/rapport
28.	Confirms patient's problem
29.	Obtains patients' view of need for action (perceived benefits)
30.	Accepts legitimacy of patient's views/beliefs (non-judgmental)
31.	Negotiates mutually acceptable plan (encourages patient to make choices; addresses concerns)
32.	Encourages patient to be involved in implementing plans (to take responsibility and be self-reliant)
33.	Uses easily understood language (avoids or adequately explains jargon)
34.	Contracts with patient regarding next step(s) for patient and dentist
35.	Summarises session briefly
F.	**Building a relationship**
36.	Demonstrates appropriate non-verbal behaviour (for example eye contact, posture & position, movement, facial expression, use of voice)
37.	Demonstrates interest
38.	Demonstrates respect
39.	Communicates warmth
40.	Bonds with the patient
41.	Shows empathy with patient
42.	Deals sensitively with embarrassing and disturbing topics

The six dimensions can also be referred to as communication tasks, while the 42 items can be referred to as communication skills.

Table 34 (below) compares the tasks and skills of the combined- and adjusted rubrics, respectively. The main differences between the combined and adjusted rubrics are the following:

- "Gathering information" as a task in the combined rubric was dismissed and replaced by the task "Structuring the interview" in the adjusted rubric.
- The sub-task "Exploration of problems" in the combined rubric was incorporated with the task "Understanding the patient's perspective" in the adjusted rubric.
- The task "Providing closure" in the combined rubric was dismissed and incorporated with the task "Reaching an agreement on problems and plans" in the adjusted rubric.

Table 34 Initial, combined rubric (left column) compared with final, adjusted rubric (right column)

A. Opening the interview **1.** Greets the patient **2.** Obtains the patient's name **3.** Introduces self **4.** Attends to physical comfort (here and throughout interview) **5.** Identifies and confirms patient's problem	**A. Opening the interview** **1.** Greets the patient **2.** Introduces self **3.** Obtains the patient's name
B. Gathering information *(i) Structuring the interview* **6.** Negotiates an agenda for consultation **7.** Progresses from one section to another using transitional statements (includes rationale for next section) **8.** Attends to timing *(ii) Exploration of problems* **9.** Encourages patient to give history of chief complaint **10.** Uses open questioning technique(s) **11.** Uses closed questioning technique(s) **12.** Listens attentively (no interruptions; time for patient to **13.** Facilitates patient's responses (use of encouragement, **14.** Clarifies patient's statements which are vague and need amplification **15.** Summarises at end of a specific line of inquiry to verify own interpretation of what patient has said to ensure no important data was omitted	**B. Structuring the interview** **4.** Negotiates an agenda for consultation **5.** Encourages patient to give history of chief complaint **6.** Picks up verbal cues (patient's need to contribute information/ask questions; information overload; distress) **7.** Picks up non-verbal cues (patient's need to contribute information/ask questions; information overload; distress) **8.** Progress form one section to another using transitional statements (includes rationale for next section)
C. Understanding the patient's perspective **16.** Determines patient's expectations regarding each problem **17.** Picks up verbal cues (patient's need to contribute information/ask questions; information overload; distress) **18.** Picks up non-verbal cues (patient's need to contribute information/ask questions; information overload; distress) **19.** Encourages expressions of feelings **20.** Encourages patient to contribute ideas/suggestions/ preferences/beliefs **21.** Accepts legitimacy of patient's views/beliefs (non-judgmental)	**C. Understanding the patient's perspective** **9.** Attends to physical comfort (here and throughout interview) **10.** Determines patient's expectations regarding each problem **11.** Encourages expressions of feelings **12.** Uses open questioning technique **13.** Uses closed questioning techniques **14.** Facilitates patient's responses (use of encouragement, silence, repetition, paraphrasing, interpretation) **15.** Listens attentively (no interruptions; time for patient to think before answering) **16.** Clarifies patient's statements which are vague and need amplification **17.** Summarises at end of a specific line of inquiry to verify own interpretation of what patient has said to ensure no important data was omitted **18.** Encourages patient to contribute ideas/suggestions/references/ beliefs

D. Sharing information **22.** Discusses options **23.** Discusses consequences of no action **24.** Provides information (procedures; processes; benefits & advantages; value & purpose) **25** Uses easily understood language (avoids or adequately explains jargon) **26.** Shares own thoughts; ideas/dilemmas/thought processes	**D. Sharing information** **19.** Provides information (procedures; processes; benefits & advantages; value & purpose) **20.** Discusses options **21.** Discusses consequences of no action **22.** Shares own thoughts; ideas/dilemmas/thought processes **23.** Elicits patient's understanding about plans and treatments **24.** Takes patient's lifestyle, beliefs, cultural background and abilities into consideration **25.** Asks about patient's support network for decision-making
E. Reaching an agreement on problems and plans **27.** Elicits patient's understanding about plans and treatments **28.** Obtains patients' view of need for action (perceived benefits) **29.** Takes patient's lifestyle, beliefs, cultural background **30.** Negotiates mutually acceptable plan (encourages patient to make choices; addresses concerns) **31.** Encourages patient to be involved in implementing treatment plan (to take responsibility and be self-reliant) **32.** Asks about patient's support network for decision-making	**E. Reaching an agreement on problems and plans** **26.** Attends to timing **27.** Reading, writing, use of computer do not interfere with dialogue/rapport **28.** Confirms patient's problem **29.** Obtains patients' view of need for action (perceived benefits) **30.** Accepts legitimacy of patient's views/beliefs (non-judgmental) **31.** Negotiates mutually acceptable plan (encourages patient to make choices; addresses concerns) **32.** Encourages patient to be involved in implementing plans (to take responsibility and be self-reliant) **33.** Uses easily understood language (avoids or adequately explains jargon) **34.** Contracts with patient regarding next step(s) for patient and dentist **35.** Summarises session briefly
F. Providing closure **33.** Summarises session briefly **34.** Contracts with patient regarding next step(s) for patient and dentist **35.** Explains possible unexpected outcomes and safety-nets appropriately	**F. Building a relationship** **36.** Demonstrates appropriate non-verbal behaviour (for example eye contact, posture & position, movement, facial expression, use of voice) **37.** Demonstrates interest **38.** Demonstrates respect **39.** Communicates warmth **40.** Bonds with the patient **41.** Shows empathy with patient **42.** Deals sensitively with embarrassing and disturbing topics
G. Building a relationship **36.** Demonstrates interest **37.** Demonstrates respect **38.** Communicates warmth **39.** Demonstrates appropriate non-verbal behaviour (for example eye contact, posture & position, movement, facial expression, use of voice) **40.** Reading, writing, use of computer do not interfere with dialogue/rapport **41.** Shows empathy with patient **42.** Deals sensitively with embarrassing and disturbing topics **43.** Bonds with the patient	

8.2.1.2 Male students compared with female students within training cycle 1.

8.2.1.3 Male students compared with female students within training cycle 2.

Table 35 Comparing gender within training cycles by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
		Mean n = 25	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	Dimension: Opening the interview	3.52	0.50	3.39	0.54	0.2911
	Dimension: Structuring the interview	1.95	0.41	1.93	0.41	0.7992
	Dimension: Understanding patient's perspective	1.55	0.47	1.44	0.27	0.5500
	Dimension: Sharing information	1.46	0.50	1.37	0.18	0.7699
	Dimension: Reaching an agreement	1.94	0.42	1.88	0.30	0.6840
	Dimension: Building the relationship	2.36	0.68	2.30	0.48	0.6840
	Rubric Total	2.13	0.38	2.05	0.23	0.6020
2	Dimension: Opening the interview	3.29	0.59	3.60	0.45	0.0495*
	Dimension: Structuring the interview	3.17	0.53	3.19	0.52	0.8611
	Dimension: Understanding patient's perspective	2.68	0.66	2.68	0.71	0.9432
	Dimension: Sharing information	2.20	0.63	2.28	0.63	0.6925
	Dimension: Reaching an agreement	3.13	0.47	3.15	0.54	0.6925
	Dimension: Building the relationship	3.14	0.62	3.28	0.55	0.4718
	Rubric Total	2.94	0.48	3.03	0.48	0.4178
*** = significant on 5% level**						

Table 35 indicates that male students scored higher than female students during training cycle 1 in all six dimensions of the rubric. The total mean score for male students for training cycle 1 was 2.13 as compared with female students' mean score of 2.05. For training cycle 2, however, female students obtained higher mean scores than male students for all the dimensions of the rubric except for Dimension: "Understanding the patient's perspective" in which male and female students obtained equal mean scores of 2.68. The total mean score for male students for training cycle 2 was 2.94 as compared with female students' mean score of 3.03. Both male and female students obtained higher scores during training cycle 2 as compared with training cycle 1, except that male students scored lower in Dimension: "Opening the interview" during the second cycle than during the first cycle (3.29 compared to 3.52). However, no significant differences existed between male and female students with regard to the different dimensions of the Rubric in either the first or second cycle - except that during cycle 2, female students performed significantly better than male students in terms of Dimension: "Opening the interview."

8.2.1.4 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.1.5 Female students during training cycle 1 compared with female students during training cycle 2.

Table 36 Rubric: comparing training cycle within gender by Signed Rank Test

Parameter	Male			Female			Total class		
Difference: Round 1 – Round 2	**Mean n = 25**	**SD**	**p-value (< 0.05)**	**Mean n = 42**	**SD**	**p-value (< 0.05)**	**Mean n = 67**	**SD**	**p-value (< 0.05)**
Dimension: Opening the interview	0.23	0.64	0.0491*	-0.23	0.58	0.0165*	-0.06	0.64	0.4933
Dimension: Structuring the interview	-1.22	0.58	< 0.0001*	-1.25	0.69	< 0.0001*	-1.24	0.64	< 0.0001*
Dimension: Understanding the patient's perspective	-1.13	0.64	< 0.0001*	-1.23	0.70	< 0.0001*	-1.19	0.67	< 0.0001*
Dimension: Sharing information	-0.74	0.63	< 0.0001*	-0.91	0.66	< 0.0001*	-0.85	0.65	< 0.0001*
Dimension: Reaching an agreement	-1.18	0.49	< 0.0001*	-1.28	0.58	< 0.0001*	-1.24	0.55	< 0.0001*
Dimension: Building the relationship	-0.78	0.87	< 0.0001*	-0.98	0.65	< 0.0001*	-0.91	0.74	< 0.0001*
Rubric Total	-0.80	0.49	< 0.0001*	-0.98	0.50	< 0.0001*	-0.91	0.50	< 0.0001*
*** = significant on 5% level**									

Table 36 indicates that both male and female students (including the class as a whole) scored significantly higher during training cycle 2 than training cycle 1 ($p < 0.0001$) for all dimensions except Dimension: "Opening the interview." Male students scored higher during cycle 1 than cycle 2 for Dimension: "Opening the interview" (3.52 versus 3.29 - Table 35). Although female students and the class as a whole scored higher during the second training cycle compared to the first training cycle for the Dimension: "Opening the interview", the differences were not significant.

Table 36 also indicates significant higher scores during training cycle 2 compared to training cycle 1 for the total rubric ($p < 0.0001$). From Table 36 it is clear that students' ratings improved significantly from training cycle 1 to training cycle 2.

8.2.1.6 Comparing male students with female students within training cycle 1.

8.2.1.7 Comparing male students with female students within training cycle 2.

Table 37 Rubric: comparing between gender and between training cycles by Wilcoxon's Rank Sum Test

Parameter	Male n = 25		Female n = 42		p-value (< 0.05)
	Mean	SD	Mean	SD	
Difference Total Rubric	-0.80	0.49	-0.98	0.50	0.2566
* = significant on 5% level					

Table 37 indicates that no significant differences exist between male and female students in terms of each gender's development in communication skills between training cycle 1 and 2. Communication skills training did not benefit a specific gender significantly more than for the other gender (p = 0.2566).

8.2.2 "Patient's" feedback (Appendix E)

8.2.2.1 Male students compared with female students within training cycle1.

8.2.2.2 Male students compared with female students within training cycle 2.

Table 38 "Patient's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male N=25		Female N=42		
		Mean	SD	Mean	SD	p-value (< 0.05)
1	V4: I have a better understanding of dentistry	1.20	0.65	1.14	1.00	0.8387
	V5: I have an improved understanding of my dental health	1.32	0.69	1.21	0.41	0.4012
	V6: I have a mental picture of my oral condition	1.16	0.55	1.21	0.56	0.7409
	V7: A bonded relationship has been established between me and the "dentist"	2.04	1.21	1.84	0.88	0.5671
	V8: I will return for treatment	2.12	1.13	1.91	0.87	0.8189
	V9: I have confidence in the "dentist's" skills	2.16	1.14	1.77	0.81	0.4763
	V10: I am prepared to accept the proposed treatment plan	2.32	0.90	2.02	0.83	0.1618
	V11: I am satisfied with the experience	1.88	1.01	1.67	0.81	0.4842
	V12: I am motivated to keep my appointments	1.84	1.07	1.63	0.87	0.2034
	V13: I will pay my account promptly	2.16	1.11	1.70	0.86	0.1035
	Average score for items 4 to 13	1.82	0.79	1.61	0.56	0.2230

2	V4: I have a better understanding of dentistry	2.40	1.12	2.38	0.96	0.6361
	V5: I have an improved understanding of my dental health	2.72	1.02	2.86	1.03	0.7215
	V6: I have a mental picture of my oral condition	3.16	0.90	3.14	0.95	0.9845
	V7: A bonded relationship has been established between me and the "dentist"	2.96	0.98	3.24	1.10	0.7118
	V8: I will return for treatment	3.32	1.07	3.31	1.05	0.6641
	V9: I have confidence in the "dentist's" skills	3.36	1.19	3.12	1.11	0.2967
	V10: I am prepared to accept the proposed treatment plan	3.36	1.19	3.52	1.04	0.7312
	V11: I am satisfied with the experience	3.16	1.11	3.21	1.12	0.8815
	V12: I am motivated to keep my appointments	3.12	1.13	3.07	1.24	0.9638
	V13: I will pay my account promptly	3.16	1.11	3.21	1.22	0.6086
	Average score for items 4 to 13	3.07	0.97	3.11	0.94	1.0000
*** = significant on 5% level**						

Table 38 indicates that, in terms of the "patient's" feedback, there were no significant differences between male and female students in either training cycle one or two. The average score for male students was higher than female students during training cycle 1 (1.82 compared to 1.61). However, female students obtained a higher average score during training cycle 2 than male students (3.11 compared to 3.07). This finding corresponds with the SP's feedback in terms of the Rubric (Table 35). Furthermore, while for five of the variables male students scored higher during the first training cycle, female students obtained higher scores for these variables during training cycle 2. These variables were the following: "I have an improved understanding of my dental health"; "I have a mental picture of my oral condition"; "A bonded relationship has been established between the "dentist" and me"; "I am satisfied with the experience" and "I will pay my account promptly."

8.2.2.3 Male students during training cycle 1 compared with male students during training cycle 2.

Table 39 "Patient's" feedback: comparing male students by training cycles by Wilcoxon's Rank Sum Test

Parameter	Cycle 1		Cycle 2		
	Mean n = 25	SD	Mean n = 25	SD	p-value (< 0.05)
V4: I have a better understanding of dentistry	1.20	0.65	2.40	1.19	< 0.0001*
V5: I have an improved understanding of my dental health	1.32	0.69	2.72	1.02	< 0.0001*
V6: I have a mental picture of my oral condition	1.16	0.55	3.16	0.90	< 0.0001*
V7: A bonded relationship has been established between me and the "dentist"	2.04	1.21	2.96	0.98	0.0043*
V8: I will return for treatment	2.12	1.13	3.32	1.07	0.0006*
V9: I have confidence in the "dentist's" skills	2.16	1.14	3.36	1.19	0.0010*
V10: I am prepared to accept the proposed treatment plan	2.32	0.90	3.36	1.19	0.0007*
V11: I am satisfied with the experience	1.88	1.01	3.16	1.11	0.0004*
V12: I am motivated to keep my appointments	1.84	1.07	3.12	1.13	0.0001*
V13: I will pay my account promptly	2.16	1.11	3.16	1.11	0.0020*

Table 39 indicates that the "Patient's" feedback was significantly higher for training cycle 2 than for training cycle 1 with regard to male students ($p < 0.05$). This is a confirmation of the results represented in Table 36 in terms of the Rubric.

8.2.2.4 Female students during training cycle 1 compared with female students during training cycle 2.

Table 40 "Patient's" feedback: comparing female students by training cycles by Wilcoxon's Rank Sum Test

Parameter	Cycle 1		Cycle 2		
	Mean n = 42	SD	Mean n = 42	SD	p-value (< 0.05)
V4: I have a better understanding of dentistry	1.14	0.35	2.38	0.96	< 0.0001*
V5: I have an improved understanding of my dental health	1.21	0.41	2.86	1.03	< 0.0001*
V6: I have a mental picture of my oral condition	1.21	0.56	3.14	0.95	< 0.0001*
V7: A bonded relationship has been established between me and the "dentist"	1.84	0.87	3.24	1.10	< 0.0001*
V8: I will return for treatment	1.91	0.87	3.31	1.05	< 0.0001*
V9: I have confidence in the "dentist's" skills	1.77	0.81	3.12	1.11	< 0.0001*
V10: I am prepared to accept the proposed treatment plan	2.02	0.83	3.52	1.04	< 0.0001*
V11: I am satisfied with the experience	1.67	0.81	3.21	1.17	<0.0001*
V12: I am motivated to keep my appointments	1.63	0.87	3.07	1.24	<0.0001*
V13: I will pay my account promptly	1.70	0.86	3.21	1.22	<0.0001*

Table 40 indicates that the "Patient's" feedback was significantly higher for training cycle 2 than for training cycle 1 with regard to female students ($p < 0.0001$). This is a confirmation of the results represented in Table 36 in terms of the Rubric.

8.2.3 "Patient's" feedback compared with Rubric

8.2.3.1 Male students during training cycle 1.

8.2.3.2 Female students during training cycle 1.

8.2.3.3 Male students during training cycle 2.

8.2.3.4 Female students during training cycle 2.

Table 41 "Patient's" feedback: comparing with Rubric

Training cycle	Male			Female			Total		
	Mean n = 25	SD	p-value (< 0.05)	Mean n = 42	SD	p-value (< 0.05)	Mean n = 67	SD	p-value (< 0.05)
1	-0.31	0.49	< 0.0001*	-0.44	0.46	0.0028*	-0.39	0.47	< 0.0001*
2	0.14	0.58	0.3677	0.08	0.61	0.2280	0.10	0.60	0.1399

Table 41 indicates that during training cycle 1, both male and female students scored significantly higher (- 0.31 and - 0.44, respectively) in terms of the Rubric than in terms of the "Patient's" feedback ($p < 0.0001$ and $p = 0.0028$, respectively). During training cycle 2, however, both male and female students scored higher in terms of the "Patient's" feedback than the Rubric (0.14 and 0.08, respectively). Also, students did not score significantly differently in terms of the "Patient's feedback compared to the Rubric during cycle 2.

8.2.3.5 "Patient's" feedback compared with Rubric's Dimensions: "Sharing information" and "Building the relationship"

Table 42 "Patient's" feedback: comparing with Rubric by Signed Rank Test for Training Cycle 1

Training cycle	Parameter		Mean N = 67	SD	p-value (<0.05)
	Patient's" feedback	Rubric			
1	A bonded relationship has been established between me and the "dentist"	Bonds with the patient	-0.33	0.84	< 0.0011*
	I have a better understanding of dentistry/I have an improved understanding of my dental health/I have a mental picture of my oral condition	Sharing information	-0.20	0.29	< 0.0001*
	I will return for treatment/I have confidence in the dentist's" skills/I am prepared to accept the proposed treatment plan/ I am satisfied with the experience/I am motivated to keep my appointments/I will pay my account promptly	Building the relationship	-0.43	0.63	< 0.0001*
	A bonded relationship has been established between me and the "dentist"	Opening the interview	-1.89	1.20	< 0.0001*

Table 42 (continued) "Patient's" feedback: comparing with Rubric by Signed Rank Test for Training Cycle 2

Training cycle	Parameter		Mean N = 67	SD	p-value (<0.05)
	Patient's" feedback	Rubric			
2	A bonded relationship has been established between me and the "dentist"	Bonds with the patient	0.09	0.60	0.2281
	I have a better understanding of dentistry/I have an improved understanding of my dental health/I have a mental picture of my oral condition	Sharing information	0.53	0.53	< 0.0001*
	I will return for treatment/I have confidence in the dentist's" skills/I am prepared to accept the proposed treatment plan/ I am satisfied with the experience/I am motivated to keep my appointments/I will pay my account promptly	Building the relationship	0.02	0.74	0.6044
	A bonded relationship has been established between me and the "dentist"	Opening the interview	-0.61	1.19	< 0.0001*
*** = significant on 5% level**					

Table 42 (continued) indicates that the SP rated the students' significantly higher ($p < 0.05$) in terms of the Rubric (negative values) than in terms of the "Patient's" feedback during training cycle 1. During cycle 2, the SP rated the students significantly higher ($p < 0.0001$) in terms of the Rubric only in terms of "Opening the interview" compared to "A bonded relationship has been established between me and the "dentist".

8.2.4 "Patient's" feedback compared with "Dentist's" feedback

8.2.4.1 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.4.2 Female students during training cycle 1 compared with female students during training cycle 2.

Table 43 "Patient's" feedback: comparing with "Dentist's" feedback

Training cycle	Parameter	Mean n = 67	SD	p-value (< 0.05)
1	P4-13/D4-8**	-1.90	0.87	< 0.0001*
2	P4-13/D4-8	-0.62	0.94	< 0.0001*
* = significant on 5% level				

** P4 - 13: Variable numbers 4 - 13 of "Patient's" feedback (Appendix E).

D4 - 8: Variable numbers 4 - 8 of "Dentist's" feedback (Appendix G).

Table 43 indicates that "dentists" (students) rated themselves significantly higher ($p < 0.0001$) in both cycles 1 and 2 compared to their ratings by the SP.

8.2.5 "Dentist's" feedback (Appendices G & H)

8.2.5.1 Male students compared with female students within training cycle 1

8.2.5.1.1 Male students compared with female students within training cycle 1 in terms of "experience as dentist."

8.2.5.2 Male students compared with female students within training cycle 2

8.2.5.2.1 Male students compared with female students within training cycle 2 in terms of "experience as dentist."

Table 44 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	Experience as "dentist"	**Mean n= 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V4: I am comfortable interviewing patients	3.92	0.86	3.28	0.88	0.0051*
	V5: I am sensitive to psychosocial aspects of the patient's illness	3.68	0.85	3.49	0.80	0.4607
	V6: I am able to relate to patient	3.92	0.57	3.74	0.69	0.8787
	V7: I am able to elicit information from the patient	3.76	0.83	3.42	0.76	0.0709
	V8: I am able to communicate empathy	3.68	0.90	3.44	0.77	0.2796
	Average score for items 4 to 8	3.79	0.58	3.47	0.59	0.0518
2	V4: I am comfortable interviewing patients	3.96	0.61	3.71	0.64	0.0685
	V5: I am sensitive to psychosocial aspects of the patient's illness	3.80	0.58	3.62	0.79	0.9638
	V6: I am able to relate to the patient	3.80	0.50	3.71	0.74	0.4104
	V7: I am able to elicit information from the patient	3.96	0.61	3.48	0.55	0.0036*
	V8: I am able to communicate empathy	3.68	0.56	3.67	0.69	0.5466
	Average score for items 4 to 8	3.84	0.42	3.64	0.49	0.2176

*** = significant on 5% level**

Table 44 illustrates the fact that male students were significantly more “comfortable interviewing patients” compared to female students during training cycle 1 ($p = 0.0051$). However, no significant differences existed between male and female students with regard to the other aspects of their “experience as dentist” during training cycle 1. With regard to training cycle 2, male students felt significantly more “able to elicit information” than female students ($p = 0.0036$). Male students rated their experience as “dentist” higher than female students in terms of all the variables during both training cycles 1 and 2.

8.2.5.1.2 Male students compared with female students within training cycle 1

in terms of “How communication skills contribute to the dentist-patient relationship in respect of …”

8.2.5.2.2 Male students compared with female students within training cycle 2

in terms of “How communication skills contribute to the dentist-patient relationship in respect of …”

Table 45 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	How communication skills contribute to the dentist-patient relationship in respect of …	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V9: enhancing the patient's trust in you as dentist	4.20	0.96	4.32	0.92	0.2126
	V10: ensuring a relaxed relationship between the patient and you as dentist	4.20	0.87	4.30	0.77	0.8988
	V11: ensuring a willingness by the patient to share information with you as dentist	4.20	0.71	4.05	0.79	0.7313
	V12: improving, as dentist, my understanding of the patient's expectations of the dentist-patient relationship	3.92	0.86	4.26	0.76	0.0860
	V13: ensuring that the patient will return for treatment	4.32	0.75	4.16	0.81	0.2853
	V14: ensuring that the patient promotes the dental practice	4.08	0.81	4.19	0.79	0.3871
	V15: ensuring the patient's compliance with the proposed treatment plan	4.04	0.73	4.21	0.86	0.0771
	V16: personalising the treatment	3.96	0.84	4.12	1.10	0.1945
	Average score for items 9 to 16	4.12	0.64	4.20	0.70	0.4827
2	V9: enhancing the patient's trust in you as dentist	4.12	0.67	4.02	0.87	0.7410
	V10: ensuring a relaxed relationship between the patient and you as dentist	4.04	0.68	4.02	0.84	0.8306
	V11: ensuring a willingness by the patient to share information with you as dentist	4.08	0.76	4.10	0.79	0.9638
	V12: improving, as dentist, my understanding of the patient's expectations of the dentist-patient relationship	4.08	0.70	4.10	0.69	0.8815
	V13: ensuring that the patient will return for treatment	4.32	0.56	4.12	0.77	0.4178
	V14: ensuring that the patient promotes the dental practice	4.12	0.60	4.14	0.81	0.7904
	V15: ensuring the patient's compliance with the proposed treatment plan	4.04	0.68	4.29	0.60	0.0363*
	V16: personalising the treatment	4.24	0.83	4.02	0.92	0.3277
	Average score for items 9 to 16	4.13	0.46	4.10	0.61	0.7947
*** = significant on 5% level**						

Table 45 indicates that no significant differences existed between male and female students' rating of "How communication skills contribute to the dentist-patient relationship in respect of …" except for "…ensuring the patient's compliance with the proposed treatment plan" which was rated significantly higher by female students ($p = 0.0363$) during training cycle 2. While male students' average rating of "How communication skills contribute to the dentist-patient relationship in respect of …" was lower than female students' rating during training cycle 1 (4.12 compared to 4.20), male students' average rating exceeded that of female students during training cycle 2 (4.13 compared to 4.10).

8.2.5.1.3 Male students compared with female students within training cycle 1 in terms of "Communication as "dentist" in respect of…"

8.2.5.2.3 Male students compared with female students within training cycle 2 in terms of "Communication as "dentist" in respect of…"

Table 46 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	Communication in respect of your …	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V19: ability to empathise with the patient	3.64	0.76	3.21	0.83	0.0729
	V20: ability to explain clearly the diagnosis to the patient	3.64	0.91	3.21	0.94	0.1543
	V21: ability to elicit information from the patient	3.60	0.96	3.12	0.79	0.0932
	V22: relaxed way of communicating with the patient	3.72	1.02	3.09	0.92	0.0073*
	V23: ability to make the patient feel at ease	3.72	0.93	3.19	0.79	0.0236
	V24: ability to communicate in a respectful way with the patient	4.12	0.93	3.74	0.88	0.0501
	Average score for items 19 to 24	3.74	0.74	3.26	0.65	0.0089*
2	V19: ability to empathise with the patient	3.84	0.62	3.76	0.61	0.6830
	V20: ability to explain clearly the diagnosis to the patient	4.28	0.61	3.98	0.68	0.2016
	V21: ability to elicit information from the patient	4.00	0.76	3.60	0.63	0.0340*
	V22: relaxed way of communicating with the patient	3.84	0.85	3.62	0.76	0.2459
	V23: ability to make the patient feel at ease	3.76	0.72	3.52	0.80	0.2016
	V24: ability to communicate in a respectful way with the patient	4.28	0.54	3.98	0.64	0.0207*
	Average score for items 19 to 24	4.00	0.46	3.74	0.46	0.0512

*** = significant on 5% level**

Table 46 indicates that male students rated their communication significantly more relaxed than that of female students during training cycle 1 ($p = 0.0073$). The average score for all the items were significantly higher for male students than for female students during training cycle 1 ($p = 0.0089$). As far as training during cycle 2 was concerned, male students rated their communication in respect of their "ability to elicit information from the patient" and "ability to communicate in a respectful way with the patient" significantly higher than female students ($p = 0.0340$ and $p = 0.0207$, respectively). Male students' average rating in terms of their communication was also higher than the average rating for female students during training cycle 2.

8.2.5.1.4 Male students compared with female students within training cycle 1 in terms of "Aspects of communication that needs further development."

8.2.5.2.4 Male students compared with female students within training cycle 2 in terms of "Aspects of communication that needs further development."

Table 47 (below) indicates that no significant differences exist between male and female students' rating of "aspects of communication that needs further development" except that during training cycle 1, female students rated "My posture and position as ideal non-verbal behaviour" as an aspect that needed further development.

The average scores for both training cycles 1 and 2 were slightly higher for female students than for male students (3.28/3.26 and 3.10/3.02) according to Table 47. The average scores for both male and female students declined from training cycle 1 to 2: for male students from 3.26 to 3.02 and for female students from 3.28 to 3.10.

Table 47 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	Aspects of communication that need further development	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V27: My ability to share information with the patient	3.56	0.96	3.37	0.87	0.3531
	V28: My ability to communicate empathy with the patient	3.36	0.91	3.07	0.91	0.1945
	V29: My ability to elicit information from the patient	3.32	1.03	3.44	0.80	0.1989
	V30: My ability to allow the patient to ask questions	3.48	1.05	3.37	1.07	0.6199
	V31: My ability to conduct the interview in a structured way	3.24	1.01	3.49	0.86	0.2523
	V32: My ability to listen attentively	3.36	0.86	3.07	0.91	0.4842
	V33: My ability to make eye contact	3.28	1.31	3.05	1.13	0.3089
	V34: My posture and position as ideal non-verbal behaviour	3.04	0.89	3.37	0.85	0.0306*
	V35: My use of facial expressions as ideal non-verbal behaviour	3.04	0.98	3.26	0.76	0.2630
	V36: My use of voice in communication with the patient	2.79	1.02	3.33	0.84	0.0336*
	Average score of items 27 to 36	3.26	0.77	3.28	0.52	0.8934
2	V27: My ability to share information with the patient	3.08	1.12	3.29	0.99	0.6735
	V28: My ability to communicate empathy with the patient	3.00	0.87	3.21	1.05	0.4405
	V29: My ability to elicit information from the patient	3.04	1.10	3.10	0.85	0.6641
	V30: My ability to allow the patient to ask questions	3.04	1.14	2.95	1.06	0.5295
	V31: My ability to conduct the interview in a structured way	3.20	0.82	3.26	0.96	0.8815
	V32: My ability to listen attentively	2.96	1.27	3.02	1.14	0.7215
	V33: My ability to make eye contact	3.00	1.22	3.02	1.30	0.6830
	V34: My posture and position as ideal non-verbal behaviour	3.00	0.87	2.98	0.92	0.8004
	V35: My use of facial expressions as ideal non-verbal behaviour	2.96	0.93	3.10	0.91	0.4104
	V36: My use of voice in communication with the patient	2.96	1.17	3.12	0.99	0.8509
	Average score of items 27 to 36	3.02	0.83	3.10	0.76	0.7162
*** = significant on 5% level**						

8.2.5.1.5 Male students compared with female students within training cycle 1 in terms of "Experience as role-playing as a "dentist"

8.2.5.2.5 Male students compared with female students within training cycle 2 in terms of "Experience as role-playing as a "dentist"

Table 48 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	Experience of role-playing as a "dentist"	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V39: Experience of comfort	3.60	1.00	3.00	0.90	0.0296*
	V40: Learning about the patient	3.64	0.70	3.40	0.90	0.3211
	V41: The importance of attentive listening	3.92	0.86	3.86	0.94	0.6289
	V42: Structured way of communicating	3.76	0.78	3.49	0.94	0.3401
	V43: Novel way of learning to communicate with the patient	3.72	0.84	3.49	0.86	0.4156
	Average score of items 39 to 43	3.73	0.63	3.45	0.65	0.1786
2	V39: Experience of comfort	3.68	0.63	3.48	0.71	0.1557
	V40: Learning about the patient	3.96	0.73	3.67	0.65	0.1797
	V41: The importance of attentive listening	4.32	0.56	4.10	0.66	0.0666
	V42: Structured way of communicating	4.12	0.67	3.79	0.90	0.2512
	V43: Novel way of learning to communicate with the patient	3.64	0.95	3.74	0.89	0.9020
	Average score of items 39 to 43	3.94	0.47	3.75	0.53	0.2128

*** = significant on 5% level**

Table 48 indicates that male students felt significantly more "comfortable" than female students during training cycle 1 (p = 0.0296). Male students had, in general, a more positive experience than female students during both training cycles. Both male and female students' ratings increased from training cycle 1 to training cycle 2: for male students from 3.73 to 3.94 and for female students from 3.45 to 3.75.

8.2.5.1.6 Male students compared with female students within training cycle 1 in terms of "How "dentist" experienced session"

8.2.5.2.6 Male students compared with female students within training cycle 2 in terms of "How "dentist" experienced session"

Table 49 "Dentist's" feedback: comparing gender by Wilcoxon's Rank Sum Test

Training cycle	Parameter	Male		Female		
	How "dentist" experienced session …	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**p-value (< 0.05)**
1	V46: in respect of your interaction with the patient	4.20	0.87	3.67	0.75	0.0039*
	V47: as a novel learning experience	4.12	0.78	4.23	0.65	0.5248
	V48: as a relevant learning experience	4.48	0.65	4.37	0.69	0.6109
	V49: in respect of your control of the situation	3.84	0.85	3.33	0.71	0.0213*
	V50: in terms of being recorded on video	3.44	1.16	2.58	1.10	0.0009*
	V51: in respect of **your** perception of the patient's impression of you	3.68	0.80	2.98	0.89	0.0009*
	V52: in respect of being **unable** to proceed with treatment	2.68	1.14	2.60	0.73	0.5165
	Average score of items 46 to 52	3.78	0.51	3.40	0.49	0.0037*

2	V46: in respect of your interaction with the patient	4.04	0.68	3.69	0.64	0.0666
	V47: as a novel learning experience	4.04	0.93	3.86	0.81	0.0425*
	V48: as a relevant learning experience	4.36	0.57	4.17	0.66	0.2459
	V49: in respect of your control of the situation	3.96	0.84	3.57	0.59	0.0271*
	V50: in terms of being recorded on video	3.52	0.96	3.05	1.34	0.2157
	V51: in respect of **your** perception of the patient's impression of you	3.72	0.68	3.38	0.79	0.0705
	V52: in respect of being **unable** to proceed with treatment	2.44	1.04	2.76	0.85	0.2621
	Average score of items 46 to 52	3.73	0.49	3.50	0.53	0.1344
*** = significant on 5% level**						

Table 49 indicates that male students experienced the sessions significantly more enjoyable than did female students during training cycle 1, with regard to the following aspects:

- Interaction with the "patient" ($p = 0.0039$), who happened to be a woman.
- Control of the situation ($p = 0.0213$)
- Being video recorded ($p = 0.0009$)
- Perception of the patient's impression of you ($p = 0.0009$).

During training cycle 2, however, only two aspects were rated significantly higher by male students than female students:

- A novel learning experience (p = 0.0425)
- Control of the situation (p = 0.0271).

8.2.5.3 Male students during training cycle 1 compared with male students during training cycle 2.

8.2.5.4 Female students during training cycle 1 compared with female students during training cycle 2.

Table 50 "Dentist's" feedback: comparing by training cycle by Signed Rank Test

Parameter	Male			Female			Total class		
Difference: Round 1 – Round 2	**Mean n = 25**	**SD**	**p-value (<0.05)**	**Mean n = 42**	**SD**	**p-value (<0.05)**	**Mean n = 67**	**SD**	**p-value (<0.05)**
Experience as "dentist"	-0.05	0.62	0.6708	-0.16	0.65	0.1070	-0.12	0.63	0.1414
How communication skills contribute to the dentist-patient relationship in respect of…	-0.02	0.55	0.7626	0.12	0.80	0.4400	0.07	0.71	0.6454
Communication in respect of your…	-0.26	0.79	0.1791	-0.50	0.56	< 0.0001*	-0.41	0.66	< 0.0001*
Aspects of communication that need further development	0.23	0.86	0.1809	0.18	0.77	0.2402	0.20	0.80	0.0848
Experience as role-playing as "dentist"	-0.22	0.47	0.0219*	-0.31	0.63	0.0010*	-0.27	0.57	< 0.0001*
How "dentist" experienced session…	0.05	0.56	0.7338	-0.12	0.55	0.1850	-0.05	0.56	0.4126
*** = significant on 5% level**									

Table 50 indicates that both male and female students rated their "experience as dentist" significantly higher during the second training cycle than during the first training cycle ($p = 0.0219$ and $p = 0.0010$ respectively). However, female students also rated their "communication as dentist" significantly higher during the second training cycle as compared with the first training cycle ($p < 0.0001$). Both male and female students rated "Aspects of communication that need further development" higher during training cycle 1 than training cycle 2 as indicted by the positive values of 0.23 and 0.18 respectively (Table 50). Female students also rated "communication skills' contribution to the dentist-patient relationship" higher during the first training cycle than during the second training cycle as reflected in the positive value of 0.12.

8.2.6 "Dentist's" feedback (Appendix H) compared with Rubric

8.2.6.1 Statement: "I am comfortable interviewing patients" compared with the total Rubric score

8.2.6.2 Statement: "I am comfortable interviewing patients" compared with each of the Rubric' six dimensions

8.2.6.3 All five aspects of "experience as dentist" compared with each of the Rubric's six dimensions

Table 51 "Dentist's" feedback: comparing with Rubric by Signed Rank Test

Training cycle	Parameter**		Mean n= 67	SD	p-value (< 0.05)
	"Dentist's" feedback	Rubric			
1	D4	Total Rubric score	1.43	0.97	< 0.0001*
	D4	Dim1	1.61	0.98	< 0.0001*
	D4	Dim2	2.03	1.00	< 0.0001*
	D4	Dim3	1.19	1.10	< 0.0001*
	D4	Dim4	2.11	0.98	< 0.0001*.
	D4	Dim5	1.58	0.98	< 0.0001*
	D4	Dim6	0.08	1.07	0.4578
	D4-8	Dim1	1.69	0.72	< 0.0001*
	D4-8	Dim2	2.11	0.70	< 0.0001*
	D4-8	Dim3	1.27	0.86	< 0.0001*
	D4-8	Dim4	2.19	0.72	< 0.0001*
	D4-8	Dim5	1.66	0.74	< 0.0001*
	D4-8	Dim6	0.15	0.78	0.0990
2	D4	Total score Rubric	0.81	0.76	< 0.0001*
	D4	Dim1	0.67	0.78	< 0.0001*
	D4	Dim2	1.13	0.91	< 0.0001*
	D4	Dim3	0.58	0.82	< 0.0001*
	D4	Dim4	1.56	0.87	< 0.0001*.
	D4	Dim5	0.63	0.83	< 0.0001*
	D4	Dim6	0.32	0.75	< 0.0007*
	D4-8	Dim1	0.57	0.68	< 0.0001*
	D4-8	Dim2	1.04	0.77	< 0.0001*
	D4-8	Dim3	0.49	0.68	< 0.0001*
	D4-8	Dim4	1.47	0.72	< 0.0001*
	D4-8	Dim5	0.53	0.65	< 0.0001*
	D4-8	Dim6	0.23	0.63	0.0051*
*** = significant on 5% level**					

** D4 = Variable number 4 in questionnaire: "Dentist's" feedback = "I am comfortable interviewing patients."

D4 - 8 = Variable number 4 - 8 in questionnaire: "Dentist's" feedback = "I am comfortable interviewing patients/I am sensitive to psychosocial aspects of the patient's illness/I am able to relate to the patient/I am able to elicit information from the patient/I am able to communicate empathy."

Dim 1 = Dimension 1 according to factor analysis (Table 32, section 8.2.1) = Reaching an agreement

Dim 2 = Dimension 2 according to factor analysis (Table 32) = Understanding the patient's perspective.

Dim 3 = Dimension 3 according to factor analysis (Table 32) = Building a relationship

Dim 4 = Dimension 4 according to factor analysis (Table 32) = Sharing information

Dim 5 = Dimension 5 according to factor analysis (Table 32) = Structuring the interview

Dim 6 = Dimension 6 according to factor analysis (Table 32) = Opening the interview

Table 51 indicates that students, by means of the questionnaire: "Dentist's" feedback, scored the statement "I am comfortable interviewing patients" (D4) significantly higher ($p < 0.0001$) during both the first and second training cycles as compared with the SP's score in terms of the students' overall communication skills by means of the rubric, except for Dimension 6: "Opening the interview" during training cycle 1.

The five aspects of "experience as dentist" were all scored significantly higher by the students ($p < 0.0001$) during both the first and second training cycles as compared to the score by the SP in terms of the students' overall communication skills by means of the rubric, except for Dimension 6: "Opening the interview" of the rubric during training cycle 1 ($p = 0.0990$).

Overall, Table 51 indicates that students rated themselves higher as compared with the SP's rating of their communication skills.

8.2.6.4 "Dentist's" feedback in terms of importance of topics addressed in lectures

Table 52 "Dentist's" feedback: importance of topics addressed in lectures

Training cycle	Parameter	Male		Female		Total group	
	The importance of the following topics in terms of the lectures …	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**Mean n = 67**	**SD**
2	Importance of dentist-patient relationship	4.60	0.12	4.64	0.58	4.63	0.57
	The **theoretical** basis defining the therapeutic relationship	3.88	0.83	3.88	0.86	3.88	0.84
	The **philosophical** basis defining the therapeutic relationship	3.64	0.99	3.69	0.81	3.67	0.88
	Characteristics of relationship-centered care	4.16	0.75	4.12	0.67	4.13	0.69
	Communication elements as indicators of relationship-centered care	4.16	0.75	4.17	0.85	4.16	0.81
	Trust in the dentist-patient relationship	4.52	0.59	4.64	0.58	4.60	0.58
	What trust is	4.24	0.78	4.24	0.82	4.24	0.80
	Predictors of trust	4.52	0.59	4.36	0.69	4.42	0.65
	Trust and satisfaction	4.44	0.58	4.45	0.74	4.45	0.68
	Dimensions of trust	4.36	0.70	4.14	0.84	4.22	0.79
	The essential elements (tasks) of dentist-patient communication	4.40	0.65	4.40	0.83	4.40	0.76
	Average score	4.27	0.67	4.25	0.75	4.25	0.73

Table 52 indicates that both male and female students rated the importance of the respective topics addressed during the lecture, as rather important - average scores for male and female students were 4.27 and 4.25, respectively.

8.2.6.5 "Dentist's" feedback in terms of appropriateness of teaching methods employed

Table 53 "Dentist's" feedback: appropriateness of teaching methods employed

Training cycle	Parameter	Male		Female		Total group	
	Methods employed in terms of the whole teaching experience	**Mean n = 25**	**SD**	**Mean n = 42**	**SD**	**Mean n = 67**	**SD**
2	**Lectures**	3.88	0.67	3.67	1.03	3.75	0.91
	Making **video** recordings	4.20	0.76	4.33	0.85	4.28	0.81
	Use of a **standardised patient**	4.36	0.76	4.50	0.63	4.45	0.68
	Evaluation of skills by means of **"Rubric"**	4.04	0.68	4.14	0.72	4.10	0.70
	The **"dentist's"** feedback	4.16	0.85	4.36	0.76	4.28	0.79
	The **"patient's"** feedback	4.44	0.71	4.57	0.59	4.52	0.64
	Average	4.18	0.74	4.26	0.76	4.23	0.76

Table 53 indicates that both male and female students rated the appropriateness of the teaching methods employed during the study, rather high. Female students rated the appropriateness of the teaching methods employed during the study slightly higher than male students - 4.26 compared to 4.18.

8.2.7 Qualitative data: Summary of main findings

- As a result of the factor- and item analyses employed in the study, the initial, combined rubric of relational communication skills consisting of seven dimensions (A - G) and 43 items (1 - 43), was converted into a final, adjusted rubric consisting of six dimensions (A - F) and 42 items (1 - 42).
- Male students scored higher than female students during training cycle 1 in all six dimensions of the rubric.
- For training cycle 2, female students obtained higher mean scores than male students for all the dimensions of the rubric except for Dimension: "Understanding the patient's perspective" in which male and female students obtained equal mean scores of 2.68.
- No significant differences existed between male and female students with regard to the different dimensions of the Rubric in either the first or second cycle - except that during cycle 2, female students performed significantly better than male students in terms of Dimension: "Opening the interview."
- Both male and female students (including the class as a whole) scored significantly higher during training cycle 2 than training cycle 1 ($p < 0.0001$) for all dimensions except Dimension: "Opening the interview."
- No significant differences existed between male and female students in terms of each gender's development in communication skills between training cycle 1 and 2. Communication skills training did not benefit a specific gender significantly more than for the other gender ($p = 0.2566$).
- In terms of the "patient's" feedback, there were no significant differences between male and female students in either training cycle one or two. This finding corresponds with the SP's feedback in terms of the Rubric.
- "Patient's" feedback was significantly higher for training cycle 2 than for training cycle 1 with regard to male - and female students ($p < 0.05$ and $p < 0.0001$, respectively).
- Male students were significantly more "comfortable interviewing patients" compared to female students during training cycle 1 ($p = 0.0051$). However, no

significant differences existed between male and female students with regard to the other aspects of their "experience as dentist" during training cycle 1.

- Male students rated their communication significantly more relaxed than that of female students during training cycle 1 ($p = 0.0073$).
- No significant differences exist between male and female students' rating of "aspects of communication that needs further development" except that during training cycle 1, female students rated "My posture and position as ideal non-verbal behaviour" as an aspect that needed further development.
- Male students felt significantly more "comfortable" than female students during training cycle 1 ($p = 0.0296$).
- Male students experienced the sessions significantly more enjoyable than did female students during training cycle 1.
- Both male and female students rated their "experience as dentist" significantly higher during the second training cycle than during the first training cycle ($p = 0.0219$ and $p = 0.0010$ respectively).
- Female students also rated their "communication as dentist" significantly higher during the second training cycle as compared with the first training cycle ($p < 0.0001$).
- Students rated themselves higher as compared with the SP's rating of their communication skills.
- Both male and female students rated the importance of the respective topics addressed during the lecture, as rather important - average scores for male and female students were 4.27 and 4.25, respectively.

8.3 Qualitative data analysis

Results were obtained by means of the following two instruments:

8.3.1 "Dentist's" feedback (Appendix G) completed by each student after interview with the SP during training cycle 1 (Step 1, Figure 9 - Chapter 6, section 6.2)

8.3.2 "Dentist's" feedback (Appendix H) completed by each student after interview with the SP during training cycle 2 (Step 4, Figure 9 - Chapter 6, section 6.2)

Students completed the questionnaires: "Dentist's" feedback (Appendices G & H) immediately after the video recordings of their interviews with the SP during training cycles 1 & 2, respectively (Figure 9 - Chapter 6, section 6.2). The students were asked to give feedback in terms of the following aspects of their interviews with the SP:

- Experience as "dentist"
- Communication skills' contribution to the dentist-patient relationship
- Communication as "dentist"
  - Weak and strong points
  - Aspects of communication that need further development
  - Experience of role-playing as "dentist"
  - Least and most enjoyable experiences
- Most important things learned from the lectures
- Suggestions to improve the development of communication skills of 3rd year dental students

Students' verbatim feedback has been summarised in Appendix J and is reflected in Figures 11 & 12 as well as Tables 54 - 57, below.

- Communication skills' contribution to the dentist-patient relationship

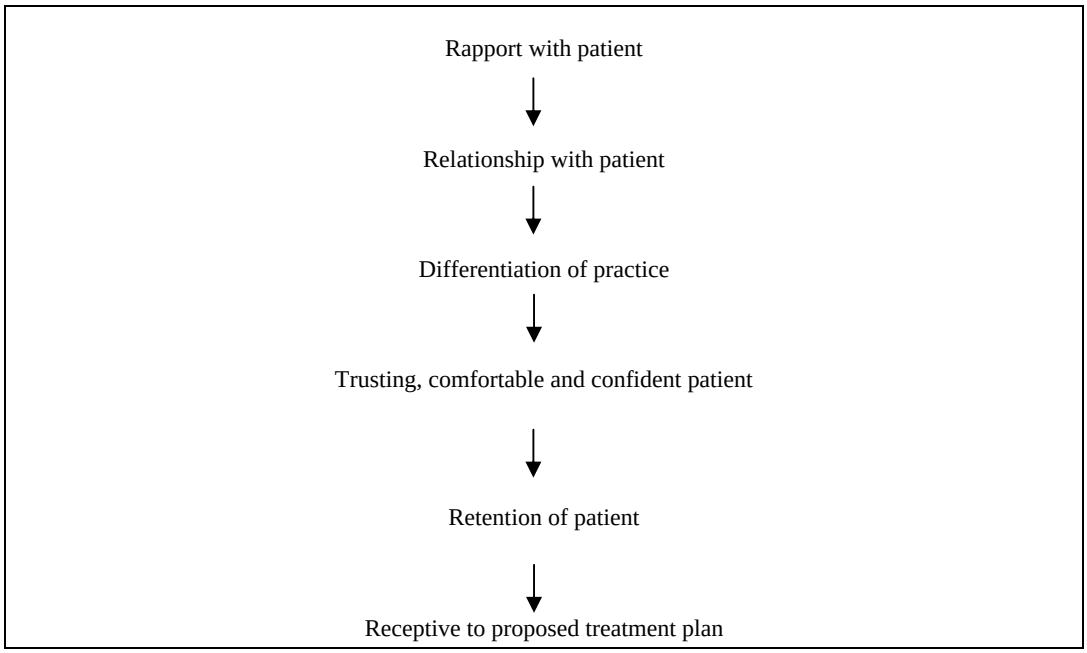

Figure 11 Communication skills' contribution to the dentist-patient relationship

Figure 11 clarifies students' perceptions that relational communication skills will eventually assist them in winning patients who are receptive to a particular proposed treatment plan. This will be effected through a sound relationship with the patient, resulting in the latter perceiving the practice as different and unique, for example a trusting, comfortable and confident patient who is prepared to stay with the practice. This is an encouraging observation by the students in view of the "Problem statement" as presented in Chapter 3 (section 3.1).

- Weak and strong points and those aspects of communication that need further development

Students' weak and strong points, as well as aspects of their communication skills that need further development, can be divided into three main categories, namely non-verbal communication, dentist-patient relationships and structuring of the interview (Table 54, below).

This can probably be attributed to the video-feedback during which students were able to observe themselves and to self-reflect on their respective performances. The video-feedback enables each student to observe him-/herself "from a distance" - to become more objective rather than subjective - and as result each student's attention would be focused on his/her relationship with the patient as well as his/her "interview lacking structure."

Table 54 Weak and strong points and those aspects of communication that need further development

Non-verbal communication	Dentist-patient relationship	Structure of the interview
Too much hand movement	Too little empathy	Not enough structure
Mumbles (Tone of voice)	Too little warmth	
Not relaxed	Do not listen enough	
Too little confidence	Too rushed	
Poor body language	Too little interaction on emotional level	
Posture and position	Not professional enough	

- Experience of role-play as "dentist"

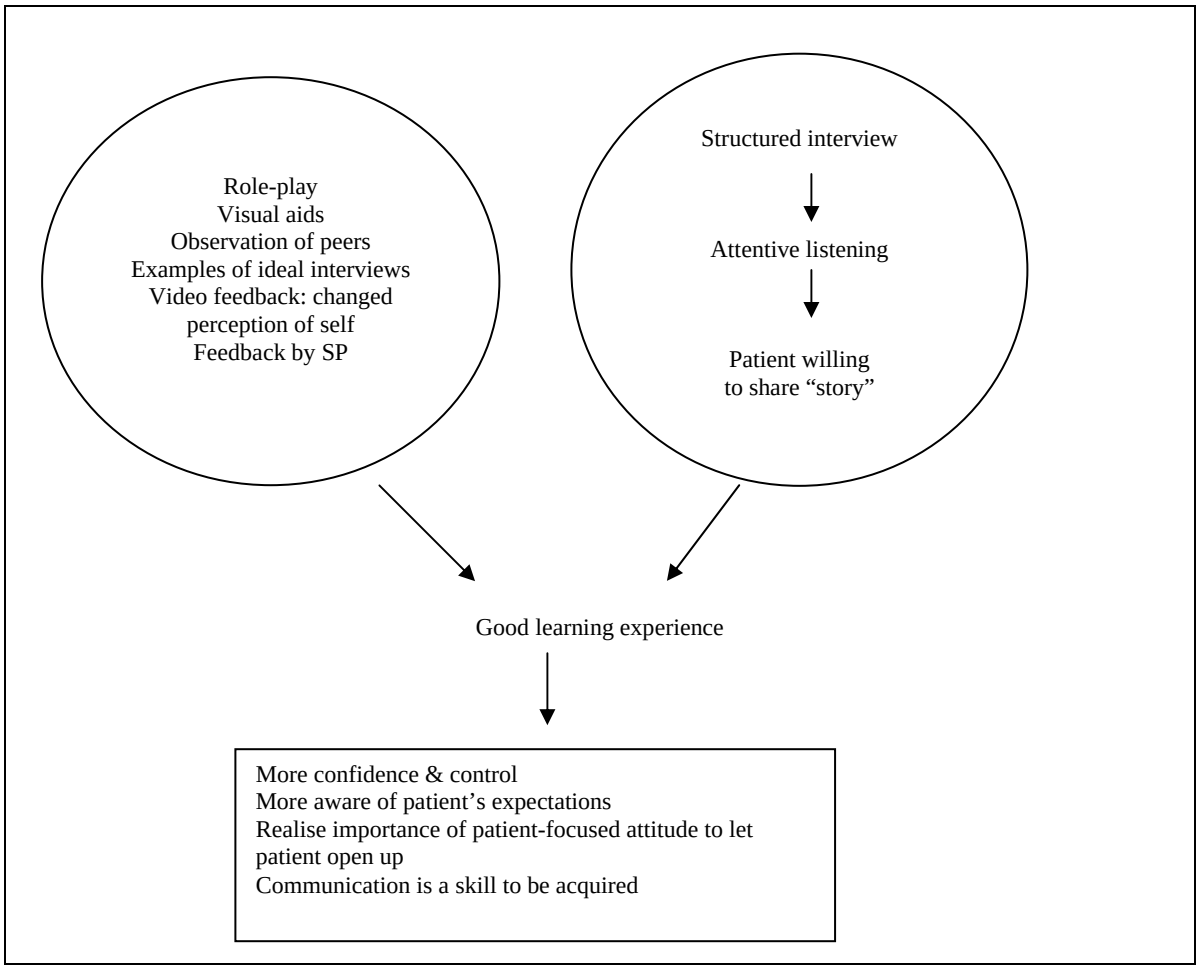

Figure 12 Experience of role-play as "dentist"

Figure 12 (above) summarises students' experiences of role-play as "dentist". It is clear that students experienced the different teaching strategies (Table 53 - Chapter 8, section 8.2.6.5) such as role-play, observation of peers, examples of ideal interviews, video feedback and feedback by SP as a "good learning experience". Students' feedback also showed that by conducting a structured interview, they were able to listen attentively to the "patient", who as a result of the student's attentive listening, was prepared to share her "story". Also, students perceived their performance during the second training cycle as an improvement compared to their performance during the first training cycle.

This is clear from the following remarks by the students during their second training cycle: “More confidence & control”; “More aware of patient’s expectations”; “Realise importance of patient-focused attitude to let patient open up” and “Communication is a skill to be acquired.”

- Least and most enjoyable experiences

Students’ feedback in terms of their least and most enjoyable experiences during role-play as “dentist” can be divided into three categories (Table 55, below): positive-, mixed- and negative experiences. It was clear from students’ feedback, that the positive experiences by far outweighed the negative experiences (Appendix J).

Table 55 Students' least and most enjoyable experiences during role-play as "dentist"

Positive experiences	Mixed experiences	Negative experiences
Pleasant & meaningful	Stressful, but extremely enlightening	Too nervous in front of camera
Very informative	As much as I disliked being video-taped at first, but after seeing the video it really helps	Not fair to watch video with other students
Useful way of learning		Uneasy being video recorded
Learned a lot		Communication could be more effective with a broader background of dentistry
Enjoyed thoroughly		Felt worse than the first round. Felt that the interview went on too long. Felt that the patient was bored.
Wonderful experience		
Good learning experience		
Fun learning experience		
Excellent experience		
Entirely appropriate way of learning		
Video feedback is extremely helpful		
Structure is an excellent aid		

- Most important things learned from the lectures

Table 56 (below) provides a summary of students' feedback to the question: "What are the most important things you have learned from the lectures?" It confirms that students accept the rationale and evidence supporting communication skills teaching and are prepared to deal with it in a practical way.

Table 56 Most important things learned from the lectures

- A patient-centered approach is important to establish trust between dentist and patient
- Patient-centeredness is about:
  - Listening to, and bonding with, the patient
  - Appropriate communication
  - Eliciting patient's emotions
  - To get in touch with patient's emotions
  - Learning about patients' expectations
  - An openness towards the patient
  - Respect for the patient as person
  - Building trust
- Initial relationship impacts on the long-term relationship with the patient
- A break-down in communication results in patients not returning for treatment
- See the person behind the teeth (bio-psychosocial dimensions)
- The dentist-patient interview must be structured

- What suggestions do you have to improve development of communication skills of 3rd year dental students? Students' inputs with regard to communications skills teaching are essential - especially as the project will be repeated within an action learning and -research paradigm. From these inputs it was clear that students required more practice as well as interactions with different patients (not only the SP). Some students also experienced their lack of dental knowledge to impact negatively on their learning experience (Table 57, below).

Table 57 Suggestions to improve development of communication skills

- More practice
- More practice with different patients
- More direct interaction with real patients
- To do the training when students have more dental knowledge
- One week block (instead of two weeks)
- There should be a role-play presented to the entire class to highlight the different approaches and mishaps that may occur

8.4 Summary and conclusion

This chapter documented the quantitative and qualitative results of the study. Tables 58, 59 and 60 (below) provide an appropriate way to conclude the chapter as they provide a compendium of students' learning experiences (127). This kind of feedback is exactly what any researcher could have hoped for and provides the encouragement and energy for future attempts in communication skills teaching of undergraduate dental students at the School of Dentistry, University of Pretoria.

Students' feedback showed that by role-playing a structured interview, their confidence to interact in a relaxed way with the "patient" was enhanced (Table 58, below).

Table 58 Effect of role-playing an interview on students' confidence

- "The visual aids helped to give more information to the patient. The structure given in the lecture helped me to be more confident. I am more relaxed now compared to the first time."
- "Good learning exercise! Such practice situations will improve my communication skills. One becomes more relaxed and enjoys it."
- "This practice helped us and enabled us to approach the patient and also helped us to improve our confidence and this be able to express ourselves."

The important roles of trust, empathy and active listening in establishing a relationship with a patient, were emphasised by most of the students (Table 59, below).

Table 59 Roles of trust, empathy and active listening on relationship with patient

- "The more I relaxed the more I became to relaise my true self and the patient's inner feelings for example putting myself into my patient's shoes. Some really touched me."
- "I realised that listening ATTENTIVELY makes it easier for me to find out more about my patient."
- "I think it is important that we are given things that establish trust. Trust is very important. As a dentist, the patient must trust you."
- "You have to have a patient-centered approach. LISTEN. See the PERSON behind the teeth!"
- "The most important things I have learned from the lectures are how to establish trust, to make use of visual aids to explain the problem to the patient; to listen to the patient and to conduct the interview in a structured way."

Third year dental students positively perceived the learning of relational communication skills (Table 60, below).

Table 60 Students' perceptions about their learning of communication skills

- "It was an excellent learning experience!"
- "Extremely enlightening!"
- "The video was extremely helpful. I was able to realise and see my mistakes. It's much better seeing your mistakes than being told by an examiner."
- "I believe that this form of training is very versatile for students, because we acquire skills that will empower us to sell dentistry and be able to retain patients. The most exciting part is video recording and feedback from fellow students and the lecturer as well as the patient."
- "The step-by-step procedure really helped me. Doing the actual interview practicing with friends and being in the patient's position made me understand what it feels like to be in a patient's position and how I would like to be treated if I was the patient."
- "This method is definitely the best way to teach communication skills. Good to do video analysis afterwards."

Chapter 9 will reflect on the results presented in this chapter.

CHAPTER 9 REFLECTION

9.1 Introduction

The current chapter will discuss the main trends and patterns in the data as it was presented in chapter 8.

This study describes the development, implementation and evaluation of a curriculum in relational communication skills. The teaching strategy employed during the study was designed to develop students' communication skills by means of an experiential and didactic teaching approach. As the focus was on the development of 3rd year dental students' communication skills through the employment of specific procedures and instruments, students conducted interviews with a SP on the basis of a realistic clinical scenario during pre- and post-training cycles. All the interviews were videotaped and evaluated in order to compare students' communication skills during the pre-training cycle with students' newly developed skills during the post-training cycle.

The discussion will follow the same sequence as the results presented in the previous chapter.

9.2 Rubric: investigation of the construct validity of the combined rubric (Tables 30 - 34; Chapter 8, section 8.2.1)

It is recommended in the literature that existing communication teaching assessment instruments should rather be refined in terms of their reliability and validity instead of continuing to develop an assessment instrument for each new research project (96). For this study, the combined rubric (Table 26 - Chapter 5, section 5.2.2; Appendix A) was chosen as the basis for the proposed curriculum for the purpose of teaching relational communication skills.

Since the combined rubric was a combination of six existing communication models (Table 22 - Chapter 4, section 4.22 and Table 24 - Chapter 5, section 5.2.1) with the researcher's experience of the South African dental market, it was attempted to refine the chosen instrument (combined rubric) in terms of its reliability and validity through a series of factor- and item analyses (Tables 30 - 32; Chapter 8, section 8.2.1.1). This resulted in an adjusted instrument (rubric) (Table 33 - Chapter 8, section 8.2.1.1; Appendix B) that is ideally suited as an assessment instrument for the teaching of relational communication skills to undergraduate students in dentistry.

9.3 Rubric (Tables 35 - 37)

As was explained in Chapter 7, section7.5, non-parametric statistical analyses (Wilcoxon Rank Sum Test) were employed on transformed data.

Both male and female students obtained higher scores for *all* dimensions of the rubric during training cycle 2 as compared with training cycle 1, except for the Dimension: "Opening the interview" where male students scored lower during the second cycle as compared with the first cycle (3.29 compared to 3.52). In a recent study in a Japanese *medical* school, students obtained a higher score only for the Dimension: "Understanding the patient's perspective" (128).

Male students were rated higher than female students during training cycle 1, while female students were rated higher during training cycle 2. This finding could be attributed to the fact that the ability to communicate skilfully and with purpose rarely occurs as a gift - it is learned (6). Female students probably have a more positive attitude towards communication skills training than male students. This finding confirms other studies recorded in the literature that female students demonstrate greater change in communication skills than their male counterparts (111; 113). Another factor that could have attributed to this finding is that male students appeared to display a higher level of confidence during training cycle 1.

All students (including the class as a whole) scored higher during training cycle 2 - an indication that students benefited significantly from the teaching strategy that was followed during the study. However, communication skills teaching did not benefit a specific gender more than the other (Table 36 - Chapter 8, section 8.2.1.4).

Previous research indicated that, for many dental schools in the United States and the United Kingdom, communication skills training involved didactic teaching practices and few opportunities for in-vivo practices (93; 94). However, this study confirms that skills, attitudes and knowledge can be discussed, lectured and practised in the classroom, but communication skills develop with practice, feedback and repetitive performance (Table 57 - Chapter 8, section 8.3) (129).

9.4 "Patient's" feedback (Tables 38 - 40)

Male students were rated higher by the SP in terms of the questionnaire: "Patient's" feedback although not significantly so than female students. This is an indication of the SP's consistent feedback in terms of the rubric and "Patient's" feedback. Female students performed better during training cycle 2 - again confirmation of the literature that female students demonstrated greater change in communication skills teaching than males (111; 113). It also confirms that women, in clinical settings, are often considered to be more positively inclined towards communication than men (107). The SP's rating about important issues such as "I have an improved understanding of my dental health"; "I have a mental picture of my oral condition"; "A bonded relationship has been established between the "dentist" and me"; "I am satisfied with the experience" and "I will pay my account promptly", was higher for female students. Female students are probably more at ease to relate to the emotional side of the patient and are probably also more inclined to make use of visual aids when presenting the treatment plan to the patient, resulting in a more receptive and loyal patient.

Both male and female students scored significantly higher during training cycle 2 (Table 39 - Chapter 8, section 8.2.2.3 and Table 40 - Chapter 8, section 8.2.2.4). This is a confirmation that students benefited from the teaching strategy that was followed during the study.

9.5 "Patient's" feedback compared with Rubric

(Table 41 - Chapter 8, section 8.2.3 and Table 42 - Chapter 8, section 8.2.3.5)

The SP rated students significantly higher during training cycle 1 in terms of the rubric than in terms of the "Patient's" feedback. During training cycle 2, however, scores in terms of the "Patient's" feedback were higher than scores in terms of the rubric, although not significantly so. A possible explanation could be that during training cycle 1 the SP's feedback in terms of the rubric was more subjective than in terms of her feedback by means of the questionnaire: "Patient's" feedback. However, the SP's experience during training cycle 1 resulted in more objective feedback during training cycle 2 in terms of both the rubric and "Patient's" feedback.

9.6 "Patient's" feedback compared with "Dentist's" feedback

(Table 43 - Chapter 8, section 8.2.4)

Students rated themselves higher as compared with their ratings by the SP. This could be due to the fact that students, in general, are in a phase of their lives that is characterised by confidence and high self-esteem. It could probably also be due to the SP's reinforcing role as well as the supportive atmosphere that prevailed during the interviews, which gave students an over-confident self-perception about their performances.

9.7 "Dentist's" feedback

9.7.1 Experience as "dentist" (Table 44 - Chapter 8, section 8.2.5)

Male students felt significantly more "comfortable interviewing patients" than female students during training cycle 1. Male students regarded themselves significantly more "able to elicit information" during training cycle 2. Furthermore, male students had a more positive "experience as dentist" - probably due to female students' lack of confidence initially or female students being less impetuous.

9.7.2 Communication skills' contribution to dentist-patient relationship
(Table 45 - Chapter 8, sections 8.2.5.1.2 & 2 and Figure 11 - Chapter 8, section 8.3)

Female students were more convinced that communication skills would ensure the patient's compliance with the proposed treatment plan. Male students' average rating of 'communication skills' contribution to the dentist-patient relationship', increased as the study progressed. This could indicate that male students became more convinced about the role of communication skills in the dentist-patient relationship as the study progressed. The finding that a large percentage of students considered communication skills to be more important after having completed the course, was confirmed in the literature (6). The opposite, however could be said about female students.

Figure 11 appears to clarify students' perceptions that communication skills would eventually result in a patient who is receptive to the proposed treatment plan. This will be effected through a sound relationship with the patient, resulting in a patient perceiving the practice as different and unique. This in turn leads to a trusting, comfortable and confident patient prepared to stay with the practice. Such is an encouraging observation by the students in view of the "Problem statement" as presented in Chapter 3, section 3.1.

9.7.3 Communication as “dentist” in respect of …
(Table 46 - Chapter 8, sections 8.2.5.1.3 & 8.2.5.2.3)

Male students rated their ‘communication as “dentist” in respect of …’ significantly more relaxed as female students during training cycle 1. The same applied to training cycle 2 although not significantly so. This finding is probably also due to female students’ initial “lack of confidence” or female students being less impetuous.

9.7.4 Aspects of communication that need further development
(Table 47 - Chapter 8, sections 8.2.5.1.4 & 8.2.5.2.4 and Table 54 - Chapter 8, section 8.3)

Female students indicated that “My posture and position as ideal non-verbal behaviour”, was an aspect that needed further development. Average scores for female students were slightly higher than for male students. This could be an indication that female students tend to realise their “weaknesses” more readily than male students and are prepared to address them. Furthermore, that women in clinical settings are often considered to be more positively inclined towards communication than men (107).

The average scores for both male and female students in terms of ‘Aspects of communication that need further development’, declined from training cycle 1 to 2. This may be an indication that students felt more confident during training cycle 2 as compared with training cycle 1 about their communication skills and that students benefited from the video-feedback about their respective performances.

Students’ weak and strong points, as well as aspects of their communication skills that need further development, can be divided into three main categories, namely non-verbal communication, dentist-patient relationship and structuring the interview (Table 54 - Chapter 8, section 8.3).

This can probably be attributed to the video-feedback which enabled students to observe themselves and to self-reflect about their performance. The video-feedback enabled each student to observe him-/herself "from a distance" - to become more objective rather than subjective - and as result each student's attention was focused on his/her relationship with the patient as well as his/her "interview lacking structure."

9.7.5 Experience of role-play as "dentist"

(Table 48 - Chapter 8, sections 8.2.5.1.5 & 8.2.5.2.5; Table 55 - Chapter 8, section 8.3; Table 58 - Chapter 8, section 8.4; Figure 12 - Chapter 8, section 8.3)

Male students felt significantly more "comfortable" than female students during training cycle 1. However, both male and female students' ratings increased from training cycle 1 to training cycle 2 - an indication that students gained confidence as the study progressed. This finding corresponds with students' qualitative feedback (Tables 55, 58 and Figure 12).

Figure 12 summarises students' experiences of role-play as "dentist". It is clear that students experienced the different teaching strategies (Table 53 - Chapter 8, section 8.2.6.5) such as role-play, observation of peers, examples of ideal interviews, video feedback and feedback by SP as a "good learning experience". Students' feedback also showed that by conducting a structured interview, students were able to listen attentively to the "patient", who as a result of the student's attentive listening, was prepared to share her "story". Also, students perceived their performance during the second training cycle as an improvement as compared with their performance during the first training cycle. This is clear from the following remarks by the students during the second training cycle: "More confidence & control"; "More aware of patient's expectations"; "Realise importance of patient-focused attitude to let patient open up" and "Communication is a skill to be acquired."

9.7.6 How "dentist" experienced the session

(Table 49 - Chapter 8, section 8.2.5.1.6 & 8.2.5.2.6; Table 55 - Chapter 8, section 8.3)

Male students experienced the sessions significantly more enjoyable than female students during training cycle 1 with regard to the following aspects:

- Interaction with the patient
- Control of the situation
- Being video recorded
- Perception of the patient's impression of you.

This could be an indication that male students had more confidence in their interaction with the *female* SP. During training cycle 2, however, only two aspects were rated significantly higher by male students than female students:

- A novel learning experience
- Control of the situation.

This is an indication that female students felt more confident during training cycle 2, which is again confirmation of the literature that female students demonstrated greater change in communication skills than males (111; 113).

Students' experiences of role-play as "dentist" can be divided into three categories (Table 55): Positive-, mixed- and negative experiences. It was clear from students' feedback, that the positive experiences by far outweighed the negative experiences (Appendix J).

9.7.7 "Dentist's" feedback: comparing by training cycle (Table 50 - Chapter 8, sections 8.2.5.3 & 8.2.5.4)

Comparing training cycle 1 with training cycle 2, both male and female students rated their "experiences as dentist" significantly higher during the second training cycle. This could be due to students being more relaxed and aware of the situation as their confidence increased.

Female students rated "communication as dentist" significantly higher during the second training cycle - probably because female students' confidence, which was on a lower level than that of male students initially, improved more as a result. Both male and female students rated "Aspects of communication that need further development" higher during training cycle 1 than training cycle 2 - an indication that students perceived their skills to have improved from training cycle 1 to training cycle 2.

9.8 "Dentist's" feedback compared with Rubric

(Table 51- Chapter 8, section 8.2.6)

Table 51 confirmed what was reported in section 9.6 (above) in terms of Table 43: students rated themselves higher than the ratings they received by the SP. The same reasons are probably applicable for example students in general, are in a phase of their lives that is characterised by confidence and high self- esteem. It could probably also be due to the SP's reinforcing role during the interview as well as the supportive atmosphere that prevailed during the interviews, which gave students an over-confident self-perception about their performances.

9.9 "Dentist's" feedback in terms of topics addressed

(Table 52 - Chapter 8, section 8.2.6.4)

Both male and female students rated the importance of the receptive topics addressed during the lecture as rather important (4.27 and 4.25 on a scale of 5, respectively). As the curriculum is outcomes-based, it is an indication that students felt comfortable with the content of the curriculum and as a result were able to identify with the outcomes required to be competitive in an emerging South African dental market.

9.10 Appropriateness of teaching methods

(Table 53 - Chapter 8, section 8.2.6.5)

Both male and female students rated the appropriateness of the teaching strategies rather high - average scores of 4.18 and 4.26 on a scale of 5, respectively.

Students rated this course in communication skills teaching highly in terms of its perceived educational value, relevance and enjoyment. Such a favourable rating is consistent with previous studies of communication skills programs in dentistry (6; 92; 107; 130; 131; 132; 133). Students' positive evaluations may be as a result of the following:

- The methodology followed - especially the skills-based, experiential teaching approach - facilitates students' reflection on their learning experiences.
- By experiencing the role of "dentist" and "patient", students' experiential learning processes were enhanced.
- Self-evaluation, peer evaluation and evaluation by the SP, enhanced the experiential learning process and ensured positive reinforcement of the message as well as the retention of skills.
- Students gained confidence and expertise as the study progressed, which will hopefully make the transition to the clinical setting with real patients easier.
- A realistic, clinically based case study gave students exposure to psychosocial and lifestyle factors relevant to oral disease processes (6; 134).

Relational communication skills development during this course was achieved through role-playing interviews with a SP. Assessment and feedback by the SP by means of an assessment rubric and video feedback enabled each student to do self-reflection. Feedback regarding a student's interpersonal skills needs to be skilfully done (6).

It occurred directly after the interviews (Figure 9 - Steps 2 & 5 - Chapter 6, section 6.2) and took place in a constructive and sensitive way. Furthermore, the gathering of information from the "patient" requires a shift from dentist-centered communication to patient-centered communication (6). This was clearly demonstrated during this research project, when before training (training cycle 1), students tended to focus on the disease process to the exclusion of the patient's "story" (expectations, psychosocial issues and emotions) (Tables 35 - 37; Chapter 8, section 8.2.1.2 - 8.2.1.7). The feedback sessions by means of the video-feedback provided an ideal opportunity to address this tendency among students.

The teaching personnel during the research project involved a lecturer (a dentist) and the SP. It afforded the students a positive experience (Appendix J). This type of team approach exposed students to different areas of expertise during feedback.

Although the majority of students realise the importance of relational communication skills' contribution to the dentist-patient relationship (Figure 11 - Chapter 8, section 8.3), the reality is that the term "communication skills" is perceived as an intrinsic part of an individual's personality, his/her cognitive functioning and social experience (6). Also, it may suggest to students that they will be learning skills that they already possess, or that which is merely common sense or instinctively acquired. Furthermore, the fact that students are often asked to make changes to aspects of their appearance and behaviour that are of a highly personal nature, makes communication skills teaching and training very challenging. As a result, initial resistance and scepticism were addressed by stressing the fact that the term "communication skills" was referring to the dentist-patient interaction. This implies that in professional clinical consultations the expectation of reciprocity and equal sharing of conversation is not the same as in the case of ordinary conversation.

Furthermore, although closed and leading questions are characteristics of everyday conversation, they can be counterproductive in a dental consultation (6). Froelich and Bishop have noted that the ability to communicate skilfully and with purpose rarely occurs as a gift - it is learned (135).

9.11 Most important outcomes of the study

- Third year dental students positively perceived the learning of relational communication skills as a valuable and relevant experience.
- Students also perceived the teaching strategy employed for developing communications skills as appropriate and helpful. (Tables 55 & 60 - Chapter 8, section 8.3).
- The outcomes-based curriculum developed for this study provided a sound foundation for the learning experiences of the students.
- Another positive aspect of this study was the small group size: sixteen groups of four students each and one group of three students. This was in contrast to a study done in Dunedin, New Zealand by Hannah, Millichamp & Ayers (6). Their large group size (four groups of sixteen to seventeen students) may have led to lower ratings of tutor sensitivity to students' concerns, needs and progress than anticipated. They suggested that smaller groups would increase student participation and would enable more individual teaching. However, they suggested that groups should contain a maximum of ten to eleven students.
- Experience gained from this study, however, was that a group of four students seemed to be the ideal size for optimal participation and maximum benefit from lecturer and SP feedback.
- Another area that could be improved in their study according to Hannah, Millichamp & Ayers, related to the manner in which students conducted their videotaped interview sessions (6).
- Each student was asked to perform his/her interview in front of their class mates. Again, experience gained from this study was that students preferred to conduct the interview with the SP in the absence of peers or the lecturer.

9.12 Conclusion

Chapter 9 described the main trends and patterns in the data. The overall impression is that students benefited from the teaching of relational communication skills in that they gained skills to enhance their interaction with a patient. Furthermore, students developed an understanding of the importance of communication skills in the dentist-patient relationship. They became convinced that a sound dentist-patient relationship resulted in a patient being more receptive to proposed treatment.

Chapter 10 will present the re-planning cycle of the implementation and evaluation phase of the study.