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Using Explanation as a Teaching Method: How Prepared Are High School Technology Teachers in Free State Province, South Africa?

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ABSTRACT The objective of this study is twofold: to explore students' perceptions regarding the use of explanation as a teaching method in classroom teaching and to determine the impact of communication skills on teachers' explanation skills. A total of 120 participants from twelve High schools offering technology subjects completed the questionnaire, which assessed teachers' competences in the use of orientation, keys, summaries and communication skills. The first and second objective was addressed by calculating the frequencies and the percentages of questionnaire survey data. All data were analyzed using the Statistical Package for Social Science (SPSS v18 2010). The results revealed that while majority (85%) of technology teachers have adequate technology subject content knowledge, not all of them have the necessary competence in using various explanation approaches effectively. In particular, the study revealed that nearly half the number of technology teachers surveyed was found to have limited skills in the use of orientation, keys, summaries and communication. These findings suggest that ineffective use of various explanation strategies in teaching could be attributed to a number of factors, including lack of adequate preparation, lack of skills in designing explanations and inadequate training and practice in explanation during initial teacher training. The implications of these findings demand that teacher trainers should devote more time training student teachers in explanation skills during their initial teacher training.

INTRODUCTION

"Good teaching is good explanation" (Calfee 1986: 1-2). This quotation reflects the belief that the capacity to explain is critically important in teaching (Havita 2000). According to Behr (1988: 189), the art of explaining - the ability to provide understanding to others - is the central activity of teaching. Therefore, to achieve the goal of teaching, the teacher must adopt effective teaching methods that can lead to learners understanding the subject being taught. Being the most commonly used teaching method, explanation integrates well in all methods of instruction, such as discussions, seminars, practical lessons and tutorials (Havita 2000). Therefore, if used properly, this teaching method can develop logical operations: induction, deduction, comparison, analysis, synthesis and analogy.

The main objective of explanation in teaching is to enable the learners to take intelligent interest in the lesson, to grasp the purpose of what is being done, and to develop their own insight and understanding of how to do it (Rahaman 2004). In addition, and with specific reference to technology education, explanation is used in classroom teaching to provide students with an understanding of the complex and interrelated nature of technology, which is technical, procedural, conceptual and social (Hansen and Froelick 1994). This involves the ability by the teacher to use explanation effectively in order to communicate information to students. From the standpoint of technology education, explanation in teaching is an intentional activity, which represents the discovery of truth, which is based on concrete deductive arguments (Gwyneth 2007).

Explanation as it pertains to teaching can be considered as an attempt to provide understanding of a problem to others (Brown and Atkins 1986: 63). Most formal definitions characterize explanation as a statement that makes something

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comprehensible by describing the relevant structure or operation or circumstances. Predominantly, explanation is seen as a tool for describing relevant phenomena, developing students' logical thinking, and guiding students by inductive judgement to generalising. It leads to clarifying interrelations, demonstrating and justifying (Skalková 1999:172). Mayes (2006) argues that explanation goes beyond mere description. Accordingly, a key aspect of explanation is the emphasis on why things happen. In other words, one can think of explanation as an attempt to identify the cause of something. Fairhurst (1981) contextualized explanation in term of requiring something to be explained (the phenomenon that needs to be explained), an explainer (the provider of the explanation) and the explainee (the recipient of the explanation). In this context, Metcalf and Cruickshank (1991) argued that the role of an explanation is to make some concept, procedure or rule plain and comprehensible.

Brown and Armstrong (1984) operationally defined explanation as an attempt to provide understanding of a problem to others. This definition strengthens the view of Perrott (1982) who argued that a clear explanation depends on (a) identification of the elements to be related to, for example objects, events, processes and generalisation, and (b), identifying the relationship between them, for example casual, justifying and interpreting. Horwood (2006) on the other hand provides a distinction between explanation and description. According to Horwood (2006), description is purely informational, and the bits of information are isolated from any network of relatedness. In this context, an explanation is given when connections are drawn between and among pieces of information. Furthering this view, Hargie and Dickson (2003) argue that the act of explaining is essentially the same act of describing, instructing or giving of information.

According to Martin (1970: 59), the job of someone who explains something to someone "is to fill in the gap between his audience's knowledge or beliefs about some phenomena and what he takes to be the actual state of affairs". From Martin's point of view one can argue that what counts is causing the audience to know or believe something of which they were previously ignorant. At the extreme end, explanation has been thought of in a restricted sense as a special type of telling which goes beyond description. Pavitt (2000) is of the view that answering the question "why" is an explanation.

In another debate, Trevor (2002) argues that for an explanation to be good the explanation must be valid in the context in which it is used and must also be understood by the listener. This implies that for an explanation to be understood, it should be clearly presented by the explainer. In this regard, it is part of the responsibility of the explainer to ensure that his or her explanation appears sufficiently worthwhile and interesting to the listener for them to attend to the information being provided (Wragg 2003). From Wragg's point of view, good explanations can be described as clearly structured and interesting to the explainer. While good explanation can unlock understanding, poor or inadequate explanations may lead to confusion and boredom. From another standpoint, Gordon et al. (2006) are of the opinion that explanation is deemed successful if it fulfills the purpose of explanation. This implies that for an explanation to be understood, the explanation has to appear to be well structured by the explainee.

Further to Hargie and Dickson (2003) assertions, Brown and Atkins (1997: 195) identified three types of explanation used in daily communication: descriptive, interpretive, and reason giving. Interpretive explanations interpret or classify an issue or specify the central meaning of a term or statement; descriptive explanations describe the processes, structures and procedures; and reason giving involves giving reasons based on principles or generalizations, motives or value

Wragg (1993) built his understanding of the use of explanation in teaching on the work of Brown and Armstrong (1984), and in so doing, identified two types of explaining, which, he labeled as imaginative and instructional explanation. According to Brown and Armstrong (1984: 207) imaginative lessons draw out the responses of the learners through open questions and the encouragement of long responses, and in the instructional lessons where explanation is used, the teacher provides the meaning of principles through examples and summaries. Instructional lessons on the other hand elicit principles and examples and provide summaries. It follows from these concepts that the act of explaining involves (a) something to be explained; (b) an explainer or other communication source such as print material; and (c) an explainee who is the recipient of the explanation (Fairhurst 1981). The latter may be conceived as a problem and its

solution, the explanation, consists of presenting or drawing out (eliciting) a series of linked statements, each of which are understood by the explainees and which together lead to the solution of the problem. Gage (1972) considers these linked statements as "keys" since they unlock understanding. Each of these keys contains a key statement. This may be a generalisation or principle. It may also contain examples and illustrations, and in some cases, a qualification of the main principle. When the problem to be explained is complex, there might also be a summary of key statements during the explanation, as well as a final summary.

Theories of Explanation

Within the context of philosophy of science, there have been competing ideas about scientific explanation. According to Asbaugh (1988), explanation is an activity that is associated with causation, that is, to explain an event or phenomenon is to identify its cause. Teo (2009) has favoured a cognitive account of explanation over an ontological one. In this regard, the value of an explanation is to a large extent seen as a function of its contribution to a set of pragmatically determined cognitive goals, not just its correspondence to reality.

In contrast, Stathis (1999) has treated explanation in either a realist or an epistemic (that is, anti-realist) sense. A realist interpretation of explanation (Jarvie 1991; Sayer 1992; Achinstein 2010) holds that the entities or processes an explanation posits actually exist and that explanation is a literal description of external reality. Salmon (1984), who support the notion of epistemic interpretation of explanation, argues that such entities or processes do not necessarily exist in any literal sense but are simply useful for organizing human experience and the results of scientific experiments.

According to Hempel's epistemic theory (1965) of explanation deals only in logical form, making no mention of any actual physical connection between the phenomenon to be explained and the facts purported to explain it, whereas Salmon's realist account emphasizes that real processes and entities are conceptually necessary for understanding exactly why an explanation works. Salmon's theory (1990) is also similar to Hempel's in at least one sense, and that is that both champion ideal forms of explanation, rather than anything that scientists or ordinary people are likely to achieve in the workaday world. This type of theorizing clearly has its place, but it has also been criticized by those who see explanation primarily as a form of communication between individuals. Conceptualized within these parameters, simplicity and ease of communication are not merely pragmatic, but essential to the creation of human understanding.

In contrast to these theoretical and primarily scientific approaches, Pitt (1988) favoured a theory of explanation grounded in the way people actually perform explanation. On the other hand, Sally and Parker (2005) stress the communicative or linguistic aspect of an explanation, its utility in answering questions and furthering understanding between two individuals; while an approach based in cognitive science maintains that explaining is a purely cognitive activity and that an explanation is a certain kind of mental representation that results from or aids in this activity. It is a matter of contention within cognitive science whether explanation is properly conceived as the process and results of belief revision or as the activation of patterns within a neural network.

Explanation in Teaching and Learning

In the context of education, good explanation in teaching is essential for unlocking the students' understanding of the subject. It develops students' logical thinking, and provides guidance by inductive judgment to generalising. Leinhardt (1990: 3-4) distinguished between two types of teaching related to explanations: instructional and disciplinary. According to Leinhardt (1990), instructional explanations aim to explain concepts, procedures, events, ideas and classes of problems in order to help students understand, learn and use information in a flexible way. Disciplinary explanations are built around a core of conventions within each particular discipline and try to explain what constitutes evidence, what is assumed, and what the agenda for the discipline is. They provide the legitimacy of new knowledge, reinterpret old knowledge, and challenge and address existing knowledge (Leinhardt 1990).

From a learning perspective, explanation holds a special place as one of the core critical thinking skills (Facione 1990). Good critical think-

ers, according to Facione (1998: 5), are those who can explain what they think and how they arrived at that judgment. The Delphi Study expert panel, cited by Facione (1998: 6), defined explanation as being able "to state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments". Explanation that works (Lipton 2004) is one that is "sticky" (people remember it, think about it, and can repeat it, often even days or weeks later), is easily communicated (people can explain it to each other), and guides thinking in new and better directions (it leads to new kinds of reasoning, which are not only more constructive and accurate, but more engaging).

Teaching for effective learning has been a subject of many studies in classroom teaching (Havita 2000). These studies have demonstrated that the ten most valuable properties of explanation that yield greater student achievement in decreasing order are: clarity, interest, logical organisation, selection of appropriate content, eliciting responses from students, focusing attention upon important points, relevance to students, use of examples and illustrations, use of diagrams and enthusiasm (Daines 1981; Owen 2006). In support, the research literature by Cruikshank and Metcalfe (1994) and Brophy (2002) indicate that good explanation has clarity of structure and an interesting presentation. Fluency, including the notions of emphasis, clear transition and absence of vagueness and absence of false start are all associated with effective presentation. Studies of expressiveness (Wragg 1993; Brophy 2002) show that purposeful variations in voice, gesture, manner and use of teaching aid all contribute to the interest and effective of explanation.

A review of the literature (Brown and Armstrong 1982; Rahaman 2004) revealed that effectiveness of the skill of explanation is greatly influenced by factors like continuity, fluency and simplicity. Here, continuity can be seen in two perspectives: clarity and interest are complex notions which involves among other things, the use of structuring moves such as framing statements which delineate sections of explanation, focal statements which highlight its essential features; and the use of carefully chosen examples (Brown and Armstrong 1982).

In an earlier study, Standford and Gage (1972) reported that a good explanation starts with "orientation" or "lead" of the question to be explained. A "lead" captures and directs the attention of the explainees to what is being explained. Besides, it refreshes the memories of the explainees on the question being explained, in instances where the explainees had encountered this information before. Standford and Gage (1972) maintain that successful explanation contains a higher proportion of statements (keys) which link various elements of the explanation followed by good summaries, for example, key statement, examples, qualification and restatement. A later study by Wolfinger (1984) found that use of orientations and summaries in explaining questions play a very important role in enhancing effective learning and creating interest. In contrast, Rosenshine (1971) maintain that clear statement of principles and apt examples are also important keys to understanding.

In another study (Brown and Armstrong 1982 cited by Owen 2006) found that good explanatory lessons have more types of "keys" that vary the cognitive demand of students. These lessons contains more framing statements, which delineate the beginning and the end of each subtopics; more focusing statements which emphasize the key points, more relevant examples, more rhetorical questions and better use of visual aids.

The studies mentioned above indicate that explanation is an integral part of teaching strategies, for example, discussion, demonstration, group work, practical work that teachers use in their everyday teaching. The strategies for achieving good explanations are, in fact, the same as those achieving effective teaching. As stated by McDonald (1991 quoted by Hativa 2000) for an explanation to be effective, it should be appropriate to the situation, thorough and understandable, logically sound and psychologically appropriate. These requirements demand teacher's knowledge of subject content as well as the ability to communicate it more effectively to the learners.

Statement of the Problem

In the recent past, much research has focused on effective teaching methods (Mohidin et al. 2009; Renata 2008; Jingbi 2005). Numerous researchers (May et al. 2009; Cooper 2010; Hsieh et al. 2011) have explored links between class-

room teaching and emerging theories about how learners learn. However, explanation - which is the oldest method of teaching-have received less attention in educational research. Cohen (1996), for example, has noted that for many years the skills involved in explanation have received patchy attention from researchers, yet their importance for teachers in the classroom cannot be overestimated. Given the frequent use of explanation in classroom teaching, it is important to conduct studies that can shed light on teachers' levels of competence in the use of orientation, keys, summaries and communication skills which are keys to effective explanation. The purpose of this study is two-fold: to explore students, perceptions regarding the use of explanation as a teaching method in classroom teaching and to determine the impact of communication skills on teachers' explanation skills.

METHODOLOGY

Research Design

This study utilized the survey design method in which data were collected with questionnaire from a randomly selected sample. Utilizing survey design was considered to be an efficient way of collecting data from a large number of respondents, accurately representing a whole population. In addition, surveys have the benefit of providing data that is relatively free from errors (Rubin and Babbie 2008). It is for this reason that survey research was used to explore students' perceptions regarding Technology teachers' level of competency in using explanation as a teaching method. The study also utilized relevant literature in order to understand the competing ideas on the act of explaining and explanation as used in teaching and learning process.

Participants

Consistent with Mujis (2011), simple random sampling technique was used to select the participants for the study. The method of sampling was chosen because it gave everyone in the population exactly the same chance of being included in the sample. Three processes were followed before arriving at the number of the participants chosen. The target population was defined as High school students. This was followed by identifying the sample size and randomly selecting the target number of sample. Altogether 120 High school students were selected from the larger population of Grade 11 students studying Technology from twelve schools offering technology subjects. These schools are found in the Free State province of South Africa.

Instrumentation

A quantitative research methodology was used to conduct the study. The specific method chosen to investigate the research questions was a self-completed questionnaire with closed questions. The questionnaire consisted of three main sections. Section one covered variables relating to orientation, while section two assessed the use of "keys" during the explanation process. The third part of the questionnaire dealt with the use of summary after the explanation. All the items in the three sections of the questionnaire were based on a Likert scale of 1 to 5, where 1= not observed, 2=weak, 3=average, 4=good, and 5=outstanding.

Data Analysis

Data analysis is a very important stage of every survey research. It provides the basis for interpreting the quantitative data. The first objective of the study was to determine students' perceptions regarding teachers' ability to use orientation, keys and summaries effectively in their explanation. The first research objective was addressed by calculating the frequencies and the percentages of teachers' use of orientation, keys and summaries data. Second, the study sought to establish teachers' levels of communication skills. The second research objective was addressed by calculating the frequencies and percentages of the data collected using the questionnaire. All data were analyzed using the Statistical Package for Social Science (SPSS v18 2010).

Ethical Considerations

Prior to the administration of the questionnaire, letters were sent to the participating schools to seek permission to use their students in the study. Having granted permission, the student participants were asked to complete a con-

sent form to confirm that they are willing to participate in the study willingly. In the form the participants were assured that any information they provide will be treated with almost confidentiality and will only be used for the sole purpose of the study.

RESULTS

The focus of this section is to analyse and interpret the quantitative data that was collected through the questionnaire. Review of the research literature revealed four main variables that are consistently linked to a teacher's ability to explain terminology, concepts and processes more effectively. These are: orientation, use of keys, summaries, and communication skills.

1. Teachers' Use of Orientation

Section one of the questionnaire required the respondents to assess teachers' use of orientation (clear expression, use of relevant and interesting examples) when explaining technology concepts. The number and percentage of respondents who responded to each items are represented in Table 1.

The study revealed that on average, 44.9% of technology teachers used orientation effectively in their explanation. On further interrogation of the data, it was found that a large percentage (55.1%) of participants feel their teachers could neither express themselves clearly nor give relevant and interesting examples in their explanation. Also, they could not use qualifications and summarize their keys effectively. These findings suggest that the majority of technology teachers lack the skills of handling various orientation approaches effectively.

2. Respondents' Perceptions Regarding Teachers' Use of Keys

Section two of the questionnaire required the respondents to assess the use of keys by their teachers when explaining technology concepts, opening remarks, examples, qualifications and summary. The number and percentage of respondents who responded to each items are represented in Table 2.

The overall assessment of teachers' use of keys in their explanation was determined by considering responses to the three statements. Although the use of keys was generally considered as the most beneficial component of explanation in teaching technology subjects, over half (54.0%) of respondents indicated that the teachers' good use of opening remarks established a rapport between them and their teachers. Similarly, a large number (61.0%) of the respondents also indicated good use of opening remarks indicating what the teacher intended to explain. On further interrogation of the data it was found that the majority of teachers (75%) exhibited good use of keys in their explanation. This perception is supported by the fact that, to a large extent, respondents were satisfied with the teachers' use of keys in their explanation.

Table 1: Teachers' use of orientation (n = 120)

Item	*Outstanding*	*Good*	*Average*	*Weak*	*No evidence*
The key points were clearly expressed	15(12.5)	47(39.2)	42(35.0)	14(11.7)	2(1.7)
The examples were relevant	17(14.2)	40(33.3)	35(29.2)	25(20.8)	3(2.5)
The examples were interesting	17(14.2)	38(31.7)	41(34.2)	23(19.2)	1(0.8)
The qualifications were clearly stated	14(11.7)	35(29.2)	40(33.3)	24(20.0	7(5.8)
The summary of each key were clear	15(12.5)	38(31.7)	40(33.3)	19(15.8)	8(6.7)
The beginning and the end of the keys were clearly indicated	14(11.7)	34(28.3)	33(27.5)	21(17.5)	18(15.0)

Table 2: Teachers' use of keys (n =120)

Item	*Outstanding*	*Good*	*Average*	*Weak*	*No evidence*
The opening remarks gained and held attention	21(16.9)	46(37.1)	48(38.7)	9(7.3)	0
Opening remarks established rapport	19(15.3)	50(40.3)	47(37.9)	8(6.9)	0
The opening remarks indicated what the explainer intended to explain	22(17.9)	53(43.1)	38(30.9)	9(7.3)	1(0.8)

3. Respondents' Perceptions Regarding the Use of Summaries

Section three of the questionnaire required the respondents to assess teachers in the use of summary in their explanation. The number and percentage of respondents who responded to each item under the use of summaries is represented in Table 3.

The findings indicate that a small number (28.3%) of the respondents felt their teachers used summaries to bring together the main points was effectively used. Similarly, less than half (37.0%) of the respondents felt that conclusions were clearly stated. However, the overall assessment by the participants indicates that the teachers are marginally competent in the use of summary in their explanation. As indicated in the literature, orientations and summaries are considered as the most important teaching skills. This means explanation without summaries is no explanation.

4. Respondents' Perceptions Regarding the Teachers' Communication Skills

This section of the questionnaire sought to establish the perceptions of students regarding their teachers' use of communication skills during explanation. Table 4 presents the summary statistics of frequencies and the percentage of the respondents who responded to each item under teachers' communication skills.

Data in Table 4 show a large number (72.6%) of respondents who felt that their teachers' use of teaching aids was satisfactory. Regarding students' perceptions towards teachers' communication skills, the research findings support the view that appropriate use of teaching aids can improve explanation, which in turn may lead to better understanding of what is being explained. Interestingly over half (50.9%) the number of the respondents indicated that their teachers' verbal fluency was satisfactory. However, the findings show that teachers' use of pause and silence, organization, and clarity of explanation was minimal. In summary, the findings point to a number of explanation skills that most teachers possess and those that need improvement. The findings appear to suggest that although most teachers exhibited the necessary communication skills, different teachers showed different levels of communication skills.

DISCUSSION

The primary purpose of this study was to explore students, perceptions regarding the use of explanation as a teaching method in classroom environment and to determine the impact of communication skills on teachers' explanation skills. The respondents' perception regarding teachers' use of explanation was based on clarity and fluency in explaining concepts and processes and use of orientation, keys and summaries. Brown and Atkin (1997) argues that explanations which yield greater students' achievement are based on clarity, fluency, emphasis, interest, the use of examples, summaries and recall or application questions This implies that when teachers provide clear explanations, students learn more effectively and generalize more readi-

Table 3: Teachers' use of summaries (n = 120)

Item	*Outstanding*	*Good*	*Average*	*Weak*	*Not observed*
The summary brought together the main points	10 (8.3)	24 (20.0)	42 (35.0)	34 (28.3)	10 (8.3)
The conclusions were clearly stated	8 (8.7)	34 (28.3)	40 (33.3)	31 (25.8)	7 (5.8)

Table 4: Teachers' level of communication skills (n = 120)

Item	*Outstanding*	*Good*	*Average*	*Weak*	*Not observed*
Use of gestures to emphasis and illustrate points	25(20.8)	46(38.3)	41(34.2)	8(6.7)	00
Use of teaching aid	25(20.9)	62(51.7)	25(20.8)	8(6.7)	00
Verbal fluency	20(16.7)	41(34.2)	46(38.3)	12(10.0)	1(0.8)
Use of pause and silences	12(10.0)	35(29.2)	52(43.3)	18(15.0)	3(2.5)
Absence of vagueness	14(11.7)	35(29.2)	47(39.2)	18(15.0)	6(5.0)
Organisation and clarity of the explanation	13(10.8)	32(26.7)	52(43.3)	20(16.7)	3(2.5)

ly, even in unusual situations. As Mopondi (1995) puts it, a clear explanation requires more than knowing the subject matter. It is also necessary to present the material in a way that allows students to develop an understanding of the topic. Good explainers start by finding out what students already know about the topic so that they can vary the level of explanation as needed, entwining in student contributions and seeking feedback on what students understood from their explanation. These observations support the first objective of this study which sought to explore students' perceptions regarding teachers' competences in the use of explanation as a teaching method.

Explanation is central to almost every aspect of teaching. Collecting feedback on students' perceptions of whether explanations are clear identifies whether students feel a particular teaching assisted them in understanding the subject matter. Without student understanding no explanation can be said to be clear. Studies by Daines (1981) and Owen (2006) found that explanation which yield greater student achievement are those that are clearly and logically presented and use of examples, illustrations, diagrams and teaching aids. The following similarities for some survey items were observed in the current study as compared to the previous study. Data analysis revealed that half the percentage (55.1%) of respondents was satisfied with teachers' use of orientation in the current study. However, there was also a high percentage (44.9%) of respondents who felt less satisfied with teachers' ability to neither express themselves clearly nor give relevant and interesting examples in their explanation. The study also revealed that where students perceived lack of clear explanations, they may have not been aware of what was being explained. Also, there may have been too few opportunities for students to demonstrate that they understood what was being explained or they may not have known what to do if they did not understand what was being explained.

As indicated by Gage (1972) a good explanation starts with "orientation" or "lead" of the question to be explained. A "lead" captures and directs the attention of the explainees to what is being explained. Besides, it refreshes the memory of the explainees on the question being explained. Regarding teachers' use of orientation, this study revealed a significantly high and positive views of students about the use of examples. However, the results also revealed that while most respondents are generally satisfied with the use of orientation, there is evidence to suggest that many Technology teachers have difficulty providing adequate summary and keys for each step of their explanation. Standford and Gage (1972) argues that successful explanation contains a higher proportion of statements (keys) which link various elements of the explanation followed by clear summaries. The findings of this study revealed that a high percentage (75%) of respondents is satisfied with Technology teacher's use of "keys" when explaining technology concepts. Keys that were frequently observed during explanation process include use of opening remarks, examples, qualifications, and summary. In particular, the participants felt that the opening remarks indicated what the explainer intended to explain. These findings are consistent with earlier findings (for example, Gage 1972; Brown and Armstrong 1982), which show that teachers who were the most effective explainers were clear about what keys to use and generally used more types of keys than other teachers. These lessons contained more framing statements, which delineate the beginning and the end of each sub-topic, more focusing statements which emphasize the key points, more relevant examples, more rhetorical questions, and better use of visual aids. They also found that good explanation made students engage more with higher levels of thinking. Studies of expression (Wragg 1993; Brophy 2002) show that purposeful variations in voice, gesture, manner and use of teaching aids all contribute to interest and effectiveness of an explanation. This study shows that the use of keys in explanation is an integral part of teaching strategies that teachers need to develop and use in their everyday teaching.

In terms of teachers' use of summary, this study found that a high number of the respondents are positive about their teachers' use of summary. They are of the opinion that the summary used during explanation brought together the main points and made the conclusions clear. The findings of this study support the notion presented by Kennedy (1996) that a good explanation starts with orientation (introduction) and ends with a summary of the main points. Therefore, summary, as a vital part of an effective explanation, can serve to remind the audience of

the key points and reinforce the message being conveyed. In a teaching context, the use of summary in oral explanations has the potential to maximize student engagement time through the use of a variety of reflective activities.

Dickson et al. (1997) maintain that deficiencies in explanation as a means of information-giving lie at the heart of poor levels of verbal communication. The second objective was to determine the impact of communication skills on teachers' explanation skills. This study found that Technology teachers' level of communication skills, especially verbal fluency, was perceived by students to be satisfactory. However, these findings tend to contradict early responses on teachers' ability to neither express them clearly nor give relevant and interesting examples in their explanation.

CONCLUSION

Overall, the study explored the perceptions of students regarding technology teachers' competences in using explanation as a teaching method. The study identified four key explanation criteria that are associated with a good explanation: orientation, keys, summary and good communication. The study revealed the diversity in approaches to explanation in teaching/learning of Technology education subjects. Assessment of the four elements of explanation showed that the majority of students surveyed are positive about the level of Technology teachers' competence in explaining various concepts, meanings and processes related to technology education. Contrary to the findings regarding satisfactory use of orientation and keys, the majority of the respondents perceived the use of summary as relatively weak. These findings pose a challenge to Technology teachers who need to put extra effort into improving this part of explanation.

RECOMMENDATIONS

On the basis of the research findings, the following recommendations are made: Both pre-service and in-service training serve as vital means for the development of teachers in this regard. During teacher training, student teachers should be afforded the opportunity to develop their explanation skills through a continuous programme of microteaching, which involves preparation and planning explanation. Those practicing teachers can also improve their explanation skills through continuous in-service training. As stated early in the study, good explanation requires good knowledge of subject content. Through constant research and personal experience, teachers can improve their knowledge of the subject they teach.

One of the limitations of this study is that it mainly focused on a restricted sample (Technology teachers) and a restricted location (Free State Province). A follow-up study to cover other categories is necessary to further confirm the findings of this the study. It is also recommended that a similar study be conducted to establish the impact of students' self-explanation on their long-term learning.

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