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The challenges of teaching and learning technology subject at schools in South Africa: A case of INSET teachers in Mpumalanga Province

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Abstract

Technology is one of the eight subjects taken by learners in senior phase (grade 7-9) as part of their school curriculum. Since the subject was introduced in 1998 and revised in 2002 most teachers are still battling with its implementation, particularly at the rural schools. The participants in this study were 93 teachers from rural Mpumalanga schools, North-Eastern part of South Africa, who attended continuous professional development programme in technology. Teachers came from about six school districts and thirty (30) different schools. Data were collected by means of questionnaire and structured interviews. This paper report on experience and challenges of teachers in the teaching and learning of technology. The results showed that teachers don’t have adequate resources to teach technology, but knows how to engage learners in group work and discussions. They mentioned that poor English communication makes group discussions difficult. Teacher education and training at higher education institutions should be intensified to produce teachers with proper pedagogy in teaching and learning technology.

1. Introduction

The introduction of technology as a school subject triggered an urgent need for in-service technology teacher training as part of teachers’ professional development. What exacerbated this need is the fact that technology subject was introduced as a relatively newcomer since the inception of Curriculum 2005 (Khumalo, 2004). Changes in the South African school system created an “urgent need for the re-training of teachers. A comprehensive study involving technology teachers and subject advisors throughout South Africa was conducted to “identify the specific needs” for short course in-service training. According to Khumalo (2004), 67.45% of technology teachers received in-service training prior to the introduction of technology. Thirty three (33%) indicated that they did not receive any form of in-service training before technology was introduced as a subject. This implies that many teachers were not trained to implement the technology subject.

Since the implementation of C2005 and later the National Curriculum Statement, much needed in-service training had to be provided to teachers in South African schools (Stevens, 2004). This was to prepare them for the implementation of the technology subject which presented problems for some teachers (Stevens, 2004). The training...
was not sufficient for the teaching and learning of technology and the implementation of the subject further came with challenges (Stevens, 2004).

Buchner and Hay (1999) maintain that the national in-service training programmes are often forced and not planned. They are not presented according to the needs of teachers, resulting in the teachers experiencing the training as demand, instead of needs driven. According to Mashile and Vakalisa (1999), the different school contexts were not taken into consideration and training was provided as if all schools are similar and all would benefit from the same ‘blanket –Fit All’ type of in-service training.

In-service training was also regarded as “irrelevant” to the teaching environment due to the lack of support during attendance and after implementation (Kuiper and Wilkinson, 1998). Studies have shown that teachers have a real problem in teaching the technology content knowledge and skills learnt during workshops (Dennis, 1997). Short workshops were not the best way to promote long term impact on teaching practices and due to limited time, teachers did not get the opportunity to study and reflect on this new technology information (Pithouse, 2001).

The University of KZN introduced NPDE Programmes in 2001 and technology was first implemented in 2003 (Govender, 2002). Three (3) cohorts of teachers have since graduated from the programme. There are now several INSET programmes nationally, that have since been implemented. The Advanced Certificate of Education (ACE) programmes and upgrading qualifications offered on a part-time basis have been introduced at many universities to improve the teachers’ lack of knowledge in technology (Rollnick, 2009).

Pithouse (2001) found that facilitators of OBE-training courses were not sufficiently trained in the teaching and learning of technology subject. They also did not possess adequate technology content knowledge and skills to present these workshops, hence the teachers received insufficient and poor quality training in the technology subject. This in turn had a negative impact on their ability to teach the subject.

According to Khumalo (2004) readiness for teaching technology meant more than just advocacy campaigns and information. It required mental as well as professional readiness and preparedness because of the paradigm shift that was essentially the purpose of implementing technology. Khumalo (2004) in his research found that 60.19% of his respondents were not ready for the implementation of technology when it was first introduced in various grades of the GET (grades 1-9) band. About forty (40%) of the respondents indicated that they were ready for technology at the time of implementation.

According to Reddy, Ankiewicz and de Swardt in Gumbo and Makgato (2008) teachers were being blamed for their apparent inability to prepare their learners with the knowledge and skills needed to keep up with the changing technological world. Teachers are the key to good education and they are also the key to poor education. Reddy et al, in Gumbo and Makgato (2008), argue that technology could be better taught and learnt if teachers have an understanding of what should be taught and learnt. Teachers should also have a thorough understanding of how teaching and learning occurs in technology. The purpose of the study was to investigate some challenges experienced by teachers in the teaching and learning of technology subject in the senior phase (grade 7-9).

2. Methodology

The participants in this study were 93 in-service teachers who attended continuous professional development programme in technology. Teachers came from about six school districts and thirty different schools. Data were collected by means of questionnaire and structured interviews.

Questionnaire data was analysed using SPSS statistical frequency distribution. Interview data was transcribed and coded in order to categorise the data into patterns and themes.

3. Results and discussions

The results of the study were categorised data collection instruments for clarity.
3.1.1 Results based on questionnaire

<table>
<thead>
<tr>
<th>Statements of challenge</th>
<th>Agree</th>
<th>Disagree</th>
<th>Missing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is materials and resources to conduct practical activities in technology subject</td>
<td>1 (1.1%)</td>
<td>57 (61.3%)</td>
<td>35 (37.6%)</td>
<td>93 (100%)</td>
</tr>
<tr>
<td>Learners are engaged in group work, and discussion during technology lesson</td>
<td>66 (71.0%)</td>
<td>13 (14.0%)</td>
<td>14 (15.1%)</td>
<td>93 (100%)</td>
</tr>
<tr>
<td>I have confidence in teaching technology after attending the Technology CPD programme</td>
<td>92 (98.9%)</td>
<td>1 (1.1%)</td>
<td>0 (0.0%)</td>
<td>93 (100%)</td>
</tr>
</tbody>
</table>

Table 1 shows that most (61.3%) teachers disagreed that there is materials and resources to conduct practical activities in technology subjects, as compared to only 1.1% who agreed. This finding is the same with other studies which indicated that there is lack of practical materials and relevant resources in the teaching and learning of technology (Makgato and Mji, 2006). Department of Education’s (2000) found that the difficulties in imparting the practical skills in the subject is not only caused by lack of resources, but by the teachers not possessing adequate skills and knowledge in the subject as well as poor teaching strategies. Majority of teachers (71%) also agreed that learners are engaged in group work, and discussions during the technology lessons. Teachers should organize the lesson to promote student discussion and use lesson time for small-group work, and listen for the exploratory talks going on in the class (Barnes and Todd, 1995; Mercer, 1995; Enghag, Gustafsson and Jonsson, 2007; 2009). Furthermore, majority of teachers (98.9%) agreed that they have confidence in teaching technology after attending the technology continuous professional development. This is in consistence with the study conducted by Gumbo, Makgato and Muller (2012) which found that the ACE training in technology enhanced teachers’ knowledge and understanding of technology. This is an important finding considering that technology subject is a relatively new learning area/subject and that there is dire need for training teachers to offer the same to learners.

3.1.2 Results based on the interview

Teachers were asked about challenges they experience when teaching technology subject, i.e. to make learners understand the concepts knowledge. Several teachers mentioned more or less the same thing related to lack of materials as follows:

T1: Is the learning materials because we are most doing the theory of it, they said it needs more budget to do the practical part of it.
T2: Not understanding English, lack of materials, lack of relevant textbooks. I explain the concept first integrated with previous knowledge, explain the first week properly what technology is.
T3: I did not follow the steps. I did not make lessons interesting as there are no labs equipment’s for them to do practical work.
T4: It takes me a long time to get the all learners to understand the concept knowledge.
T5: The medium of instruction that I use during technology (English) is low. Learners do not understand instructions. Mostly, only those learners coming from model C school do understand English well.
T6: The challenges which I experience is the text books which they don’t have enough information where a teacher can refer from. Even when you try to collect information the text books are in a telegram form. Being a person without background it becomes a mountain.
T7: The language is a very big problem when it comes to group work, discussion etc. it is difficult for them to read and understand a simple sentence in English.

These reflect the voices of teachers in what they perceived as challenges they experience when teaching and learning technology subject. Teachers raised the use of English as a medium of instruction as a challenge to make learners understand the subject. The same problem was found in the of Ampofu (2009), where learners didn’t
understand technology because of English language. All subjects (about eight) in the senior phase (grade 7-9) are taught in English, which is a second language (L2) to learners. Competence in the use of English language as medium of instruction on the part of both teachers and learners is crucial for effective teaching and learning. According to the DoE (2008), the majority of South African teachers do not possess the necessary knowledge and skills to support English language learning and to teach literacy skills across the entire curriculum. As part of solution to make learners understand the subject most teachers code-switch from learners mother tongue language (L1) to English. Alidou, Boly Brock-Utne, Diallo, Heugh & Wolf. (2006) argue that teachers switch codes because they are unable to express themselves fluently in English. Although code-switching is common in many of the black South African classrooms, it is not officially permitted. In a study carried out by Mwinsheikhe (2003) in Tanzania, in an interview, the teacher said: “I personally was compelled to switch to Kiswahili by a sense of helplessness born of the inability to make students understand the subject matter by using English.” Teachers code-switch in order to facilitate learning as well as to create a more relaxed atmosphere in class (Mwinsheikhe, 2003).

4. Conclusion

In this study, teachers said that they don’t have resources such as practical materials to teach technology effectively. Studies showed that effective teaching and learning does not completely depend on availability of resources. There could be lot of new materials in laboratory, if teachers don’t know how to use them, the resources become useless. Appropriate knowledge, skills and attitude from teachers result in effective teaching and learning. Institutions of higher education and training for teachers should intensify practical skills and knowledge of using materials and resources in order to produce creative and critical thinking teachers. Education departments should supply adequate materials and resources to ensure effective teaching and learning in the technology classroom. Although teachers said that they don’t experience problem in engaging learners in group work and discussions, it is not clear how this is done with limited or no resources and poor language communication. Further investigation is required to ascertain the ability to conduct effective group work and discussions and the communications in the technology classroom in order to have a good conclusive remarks.

References


