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TELL ME A STORY: RELEVANCE, SCIENCE PEDAGOGY AND THE TEACHING PROFESSION

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ABSTRACT

No education system can rise above the level of its teachers, hence their crucial role in society. The article looks at the importance of pedagogical courses from the stories as told by pre-service science teachers doing a diploma programme in science education with Bindura University of Science Education. Convenience sampling was used to sample a total of 36 participants who completed a closed 4 –point likert scale questionnaire. The questionnaire sought views of pre-service teachers on how pedagogical courses assisted them to teach science and any other improvements on present course outlines to enhance their teaching skills. Data were also obtained from focus group discussions with respondents. The group discussions focused on issues to do with relevance of pedagogical courses to science teaching, the teaching profession in general and the importance of teachers in science teaching and learning. The major research findings were that pre-service teachers attach great value to pedagogical courses in shaping and moulding the science teacher and that the courses enhance pre-service teachers' art of teaching.

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INTRODUCTION

Pedagogical courses make an important component of any teacher training programme as they form the heart of the teacher training package. It must however be noted from the onset that the teacher is the most important component in the education system. Pre-service teachers must therefore be encouraged to implement what they have learnt in pedagogical courses as a cornerstone of the teaching profession. Teachers are critical determinants of student learning and educational progress according to Sunzuma; Zezekwa and Bhukuvhani (2012). Pre-service teachers should be given experiences with teaching approaches that are similar to those being used in classrooms. The teacher is the most important element of an education system. The teacher is indispensable according to Ustuner, Demirtas and Comert (2009). In order to be successful in teaching profession, one needs to love the profession and perform it willingly as observed by Guneyli and Aslan (2009). Teachers are lifelong learners who are supported, nurtured and resourced to build the understanding and competencies required of contemporary best practices. Pedagogical courses enhance pre-service teachers to reason logically. Scientific literacy is a high priority for all citizens and teaching and learning of science is based on inquiry.

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Science is perceived as contributing significantly to the development of persons and to the economic and social well-being of the nation according to Goodrum, Hackling and Rennie (2001). Future teachers of science need sound intellectual grounding and extensive practical experience. Those who aspire to become teachers of others by necessity need to be the most outstanding students but sadly teaching does not always attract the best students because of low esteem and status of teachers and the teaching profession in the society. Before getting into finer details on the relevance of pedagogical content knowledge let us look at the term teaching profession. The term profession is described as a set of activities which are performed to produce goods or services for the public interest and to earn money in turn based on some systematic knowledge and skills acquired through some certain training and whose rules are established by society according to Kuzgun (2000). Ustuner, Demirtas and Comert (2009) see teaching as a profession which comprises activities towards starting, directing, facilitating and realising the learning process in individuals in line with a certain objective. Teaching can be taken as a task, an action or a paradigm that dominates our thinking about the best practices for teaching. Dabat (2010) realise a positive relation between student teachers' attitude towards teaching profession and the level of teaching competency. It must also be noted that the personal inclination of the teacher is one of the most important variable

of student's inclination. In other words teachers are role models of their students.

Attitudes and the teaching profession

Attitudes affect both our social perception and behaviour. Attitudes express our feeling about something. Pre-service teachers need to develop positive attitudes if they are to have any meaningful benefits from pedagogical courses for their professional development according to Zezekwa (2011). Pre-service teachers' perceptions can either facilitate or inhibit learning as noted by Mudavanhu and Zezekwa (2009). One of the important factors that affect a teacher's success and efficiency in the teaching profession is his/her attitude towards the profession. Pre-service teachers' ways of perceiving the profession is required at least as much as knowledge as observed Guneyli and Aslan (2009). The different learning environment, instruction methods and strategies which are encountered by the pre-service teachers maybe one reason for the difference in attitude towards the teaching profession from Akbulut and Karakus (2011)'s findings. The teachers' attitudes towards their profession are usually related with their enjoying of the profession, dedication and believing that they need to improve their profession and so, themselves continuously. Low status of teachers and financial rewarding of teaching may also result in negative attitudes as noted by Osunde and Hevbogie (2006).

Pedagogical Knowledge

According to Entz (2011), the word pedagogy originated from a Greek word "paidagogas" meaning:

Paidos----- a boy,
A gogos-----leader
Agein----- to lead.

In ancient Greece, a paidagogos was a trusted slave who accompanied a child to his classes, ensured his good behaviour in public, cared for his needs and tutored him with his homework. (abid). According to Hill (1997), pedagogy is the art and science of teaching. Lee Shulman (1987) developed the construct Pedagogical Content Knowledge (PCK) in response to some problems of teaching and teacher education. Shulman (1987) argues that the key to distinguishing the knowledge base of teaching lies at the intersection of content and pedagogy. Borko and Putman (1996) realise the need for a rich match between learner needs and teaching methodology. Science teachers approach scientific problems differently than scientists do, due to their understanding of pedagogical implications of learning of science. Science teachers need to have developed knowledge and skills in three areas of science, which are content knowledge, education theory and practice and broad general education. Ware (1992) notes that, there is no agreement on the balance between each area and how each should be executed to produce effective science teachers. There is a belief that certain kinds of competencies like teaching skills can best be acquired through experience rather than formal instruction. (abid). A well educated science teacher is one who has developed an understanding of how different students learn science. Teachers are not modelled during teaching practice as they have been exposed to teaching-learning situation for a greater part of their life before. Eggleston (1985) argues that a 12 week practicum is

unlikely to alter the student teachers' pre-conceptions about how a subject should be taught. Pedagogical courses prepare the pre-service teacher to take new knowledge of science and teaching into the secondary classroom as it is acquired in the pre-service programme. Pedagogical courses cover a wide range of topics which are related to delivery of content to the learner, fundamentals of teaching science, classroom management, assessment and evaluation according to Eggleston (1985). The extent to which any pre-service teacher programme emphasise any one of these categories varies a great deal from institution to institution even within the same country. (abid). According to Mestre (1991), the task of a science teacher is to identify which ideas and misconceptions are likely to be associated with particular science concepts for students of a particular level of development and culture. The constructivist approach becomes handy in helping students to understand science better. This article is trying to provide answers to the following questions from the stories as told by pre-service science teachers:

- Of what relevance are pedagogical courses to the science teacher?
- Can science teachers teach effectively without having done pedagogical courses during their training?

RESEARCH METHODOLOGY

In this case study design, a total of thirty- six final year pre-service science teachers doing a diploma in science education programme at Bindura University of science education participated in the study in which they told their stories on how they value pedagogical courses. A closed 4 point Likert scale questionnaire (1-strongly agree, 2-agree, 3-disagree, 4-strongly disagree) was used to collect data from the respondents. The questionnaire sought views of pre-service teachers on how pedagogical courses assisted them to teach science and any other improvements on present course outline to enhance their teaching skills. Focus group discussions (FGD) were done where participants were informed about the purpose of the study, the importance of their contributions and given assurance in terms of information provided. The group discussion focused on issues to do with relevance of pedagogical courses to science teaching, the teaching profession in general and the importance of teachers in science teaching and learning.

Convenience sampling technique was employed where the first 18 male and 18 female pre-service teachers to enter the lecture room for an applied science education course were used as subjects. These teachers had done a course in pedagogics during the previous semester and had undergone a one month home based teaching practice. Concerns for validity and reliability arise from the need to ensure that the conclusions drawn from the results are credible. To this end, building some redundancy into the instruments checked internal consistency where items on the same issue were repeated using different words in the questionnaire. The questionnaire was also pilot-tested to in-service science teachers doing a three year Bachelor of Science education honours degree programme at Bindura University of Science Education. Pilot testing of the instruments helped to reveal whether the questions were clear and any ambiguities on the questionnaire were attended to. Some questions were also rephrased. The pilot study helped much in refining the

questions. Data was analysed using SPSS version 16. Frequency counts expressed as percentages were computed to determine opinions of the majority. The use of simple descriptive statistics was a deliberate move by the researchers to make the information more accessible and clearer to those who will be interested in the research findings. To give an in-depth analysis, some extracts on what the participants said on their value of pedagogical courses were also recorded and noted.

RESULTS AND DISCUSSION

The findings obtained within the scope of the study are presented in Table 1.1. Frequencies of responses, percentages and the were used to determine the popularity of pre-service teachers' responses on each item.

Table1.1 Pre-service teachers' value of Pedagogical Courses

Variable	1=SA (f. %)	2=A (f. %)	3=D (f. %)	4=SD (f. %)
1. Pedagogical courses (PC) train pre-service teachers (PT) to reason logically.	23:64	12:33	1:3	0:0
2. PC enhances pre-service teachers' art of teaching.	23:64	13:36	0:0	0:0
3. PC make the VODL program real.	21:58	11:31	4:11	0:0
4. PC help pre-service teachers to understand teaching profession	23:64	13:36	0:0	0:0
5. PT are encouraged to implement what they have learnt in PC.	23:64	12:33	1:3	0:0
6. PT enjoy all PC.	11:31	11:31	13:36	1:3
7. PC are required in implementing the science curriculum.	16:44	20:56	0:0	0:0
8. PC are relevant to the teaching profession.	26:72	10:28	0:0	0:0
9. PC make the program difficult for PT.	1:3	1:3	15:42	19:52
10. PC are boring to learn.	1:3	0:0	16:44	19:52
11. PC are not useful in the teaching profession.	1:3	4:11	0:0	31:86
12. PT do not like PC.	1:3	0:0	14:39	21:58
13. The VODL program should avoid PC.	0:0	0:0	7:19	29:81
14. PT should concentrate on subject area courses only.	1:3	2:6	12:33	21:58
15. PC mould PT into real professionals.	22:61	12:33	0:0	21:58
16. PC should be more practical.	16:44	15:42	3:8	2:6
17. PC provide the basics required in the teaching profession.	23:64	10:28	2:6	1:3
18. PC are not related to other courses in the VODL program.	1:3	3:8	12:33	20:56
19. Pedagogical courses are relevant in future career.	20:56	14:39	1:3	1:3
20. PC motivate pre-service teachers to put theory into practice.	24:67	10:28	1:3	1:3

(N=36); SA-Strongly Agree; A-Agree; D-Disagree; SD-Strongly Disagree; f-Frequency

The general outlook of the respondents as shown in Table 1 is showing that pre-service teachers attach great value to pedagogical courses in shaping and moulding the science teacher. All the respondents (100%) are agreeing that Pedagogical Courses (PC) enhances pre-service teachers' (PT) art of teaching and in understanding the teaching profession. Pre-service teachers however have mixed views on whether or not they enjoy Pedagogical Courses with about 36 % confessing that they do not enjoy the courses. Pre-service teachers also note that Pedagogical courses are required in implementing the science curriculum with 94% of the respondents alluding to this fact. This is also supported by Naungchalem (2012) where he argues that the teacher must be given the skill and knowledge to develop to develop Pedagogical Content Knowledge to critique practice and challenge traditional pedagogy. Shulman (1987) argues that, having knowledge subject matter and general pedagogical strategies are not sufficient for capturing the knowledge of a good teacher. Pre-service teachers acknowledged that Pedagogical Courses motivate them to put theory into practice(94%).About 94% of the sampled Pre-service teachers agree that Pedagogical courses mould them into real professionals. PCK is an important attribute that that shape PT's attribute in terms of best teaching practices according to Naungchalem (2012), Garrisson (2005). It is also interesting to note that the PT appreciate the relevance of PC for future

career with 94% of the respondents agreeing to this fact. The overall picture as evidenced by responses from PT(in Table 1.1) is that PC provide the basic foundation of the teaching profession. Focus group discussions (FGD) with four groups averaging nine participants per group also reveal interesting stories as told by PT. The FCD themes touched mainly on issues to do with relevance of PC for effective teaching in particular and their place in the teaching profession in general. Group one pointed out that PC were relevant in appreciating different methods of teaching including traditional and the constructivist approach. On the issue of whether a teacher can teach effectively without PC, group 1 has this to say:

"No, since the teacher will face problems on applying relevant teaching methods, managing the class and general professional ethics."

Group two echoed the same sentiments, adding that PC assist PT on improvisation and increase the confidence of the teacher during lesson delivery. According to group three, the significance of PC was accorded to the relevance in it forming a strong theory base useful to practice as well as assisting in time management, scheming and planning. This is also supported by Shulman (1987) when he argues that, the teacher must be given the skills and knowledge to develop PCK to critique practice and challenge traditional pedagogy.PCK is an important attribute that shape PTs' attributes in terms of best learning practices. Group four stressed the importance of doing PC as the courses address issues on code of conduct in the teaching profession as well as improving teacher-pupil and community interaction. The second issue discussed was on whether a teacher can teach effectively without PC. Generally PT are of the idea that it is difficult to teach effectively without PC, since they assist PT on issues to do with general teaching and learning approaches, attitudes towards teaching profession and the current trends in science teacher education. Group one has this to say:

"It will be difficult to teach effectively without PC because the teacher will face difficulties in classroom management, use of different teaching methods and professional interaction with students."

Group three argued that without PC, the teacher will be lacking knowledge of handling different classroom situation as well as use of different teaching methods. The third question advanced was on why teachers are an important component of the education system. Group two noted that, teachers are important because they impart knowledge to students as well as disciplining them. Teachers were also considered to be role models of the students in particular and the society in general. Teachers were recognised as people who shape the community. This idea is supported by Beijaard, Verloop and Vermunt (2000) who observe that teachers derive their professional identity from the ways they see themselves as subject matter experts, pedagogical experts and didactical experts. Garrison (2005) argues that at the end of the day teachers need to consider whether or not they have been able to enrich the lives of the learners in their care and increase learners' life chances. Group four noted that teachers mould pupils and build the nation as they shape the country's education system.

Conclusion

According to Garrison (2005) countries around the world have become intensely interested in better preparing teachers to deliver world class education in science to their students. Pedagogy is the source of teachers' professional identity. Becoming an effective science teacher is a continuous process that stretches from pre-service experiences in undergraduate years to the end of professional career as a mile's journey begins with the first step.

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