

Trends and Issues of Research on In-Service Needs Assessment of Science Teachers: Global Vs the Malaysian Context

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Introduction

In this ever changing globalized world, the discipline of science (Biology, Physics and Chemistry) is continuously evolving. Similarly, instructional techniques used to teach the knowledge are also developed at the same pace, both as a result of new developments in Information and Communication Technology (ICT) and research in science teaching and learning. Consequently, practicing science teachers need to update their knowledge in both content and pedagogy. It is a well-known phenomenon that, in most countries, teachers of various subject knowledge expertise are often made to teach science subjects that they are not trained for. The need to continuously develop professionally is critical for science teachers. Even though these teachers might have used various kinds of coping strategies and safety net in their teaching, they still need in-service training courses to teach science meaningfully and effectively.

Objectives of the study

The main objective of the study is to identify the most prevalent needs as perceived by the Malaysian secondary science teachers in keeping abreast with the current demand in science teaching and learning and in meeting the challenges of globalization. More specifically, the objective is to identify the most prevalent needs for in service training as perceived by secondary science teachers in terms of a) science content mastery, b) pedagogical skills, c) knowledge skills in classroom and laboratory management, d) the application and integration of computers in science teaching and e) the usage of English in Mathematics and Science teaching.

This needs assessment study is essential for two purposes. First, in the Malaysian context, the last comprehensive study on the needs of in service training of science teachers was conducted in 1983. Therefore, as mentioned above, there is a need to revisit the needs of secondary Malaysian science teachers. Second, for an effective in-service training program, the program development should be directed towards meeting the stated needs of the teachers' concerns (Amir, 1993). Thus, assessing the learner needs in the planning process is an important step.

Pertinent literature review of in service needs of science teachers.

The needs assessment defined in this study is specific to science teachers' needs, in that we adopted Moore's (1977:145) definition, which is "... a conscious drive, or desire on the part of the science teacher which is necessary for the improvement of science teaching." For the purpose and context of this needs assessment study, *System Model* put forward by Kaufman (1972), which is widely used by needs assessors, is adopted. The model identifies primary needs, summarizes the nature of primary needs, and prioritizes needs for action planning.

In terms of empirical studies on in-service needs of science teachers, there appears to be a significant difference between the needs of science teachers from developed countries (such as the United States) compared to the needs of those from developing countries such as Malaysia and Jordan. It has been shown that the needs of science teachers from the developed countries (Baird and Rowsey, 1989; Mann 1993; State of Delaware; 2002) focused more on the development of students such as 'to motivate students', 'to develop strategies on developing conceptual understanding' and 'to develop strategies to promote analytical thinking and problem-solving skills'. On the other hand, the prominent needs perceived by Malaysian and Jordanian science teachers (Bakar, Rubba, Tomera & Zurub, 1988; Abu Bakar and Tarmizi 1995 and Idris 2001) were focused more on self-improvement such as 'being creative in science instruction' and 'updating knowledge of science innovations in science instruction'.

Methodology

The Science Teacher Inventory Needs of Science (STIN-Zurub & Rubba, 1983) instrument was modified and administered to 1650 science secondary teachers. A total of 72 items was constructed to reflect the needs of science teachers in secondary schools in Malaysia. First, existing perceive needs subscale were reviewed followed by a thorough review and analysis of the needs literature. Then a panel of experts in the area of science teaching representing Biology, Chemistry and Physics was asked to edit, combine, suggest and eliminate items

from the initial pool of items. Through factor analysis, 8 factors were identified. The categories were: 1) Managing and Administering Science Instruction, 2) Diagnosing and Evaluating Learners for Science Instruction, 3) Science Teacher Self Improvement, 4) Subject matter knowledge, 5) Administering laboratory science apparatus, 6) Planning science instruction, 7) The use of ICT in Science Instruction and 8) The Use of English in Science Teaching.

Findings

Data analysis indicated that the top 10 perceived needs were mainly related to the following three categories 1) The Use of ICT In Science Instruction, 2) Science Teacher Self Improvement and 3) The Use Of English In Teaching Science. The first and third findings are obviously contextual in nature whereby these particular needs arise due to the recent Malaysian government policy on the teaching of Science and Mathematics. The policy requires science and mathematics to be taught in English. 85 per cent of the respondents state the need to increase their proficiency in English. The policy also emphasizes the use of ICT in science teaching. Again, about 95 per cent of the respondents indicated the need to increase their knowledge related to ICT in order to teach science effectively.

It appears that the orientation of the needs was to develop teachers' own competency, both in English and ICT, as a response to the current development. However, such needs could be seen as a conscious drive on the part of the teachers to improve science teaching through improving oneself first. This hypothesis is further supported by another prominent needs indicated by the science teachers, which are related to the need for self-improvement. The needs revolve around concerns such as 'to improve professionalism through in-service courses', 'to gain knowledge on innovative science teaching' and 'to enhance one's thinking skills'. It appears that over the years, Malaysian science teachers' needs seem to still focus on the improvement of oneself. Perhaps, the traditional notion of teaching and learning, where teachers are source of knowledge, and are still the main practice in Malaysia, determines the needs of the teachers.

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