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WHAT ARE EXPERIMENTAL SKILLS? A STUDY WITH IN-SERVICE TEACHERS

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The teaching and learning of physics is incomplete and inadequate unless students gain a significant experience in experimental physics through a well-planned laboratory courses. The physics laboratory training is supposed to develop in students, a variety of important cognitive and psycho-motor abilities related to experimental physics. It is very well accepted that developing and nurturing 'experimental skills' is an important goal of laboratory courses. The authors, In the process of development of a laboratory course felt that it is important to identify details of specific skills and abilities which students should develop through that particular laboratory course.

As part of an ongoing survey with teachers, a need was felt to understand what do teachers and lab instructors understand by the term 'experimental skills'. Do they associate only psycho-motor skills or they include other analytical, cognitive skills under the title 'experimental skills'.

The authors, in this paper reports the results of a pilot study with 38 teachers from across the country, who were directly involved in teaching laboratory courses at various schools and colleges for at least 8 years. In the first interaction, teachers were asked to a) describe what are 'experimental skills' required in experimental physics and b) to identify and make an exhaustive list of experimental skills which they would like their students to develop through laboratory courses from grade 8 till undergraduate level. To our surprise, we noted that teachers were not able to separate psycho-motor, cognitive and affective abilities and skills. Based on their lists, we prepared a list of 83 skills and abilities and asked the same teachers to confirm if they would identify as 'experimental skill' or 'other abilities' for each of the 83 skills and abilities. The results indicate that teachers do not have clear understanding about the psycho-motor, cognitive and affective abilities and skills. Thus the authors felt a need to design a learning module for in-service teachers on objectives and goals of laboratory courses in which each aspect will be discussed and illustrated with required details. This is essential because the tasks, methods, contents and learning processes involved in the development of these psycho-motor, cognitive and affective skills and abilities are different and should be appropriately emphasized during the designing of a laboratory course and strategy for instruction and assessment.

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