

## Experts and Novices in Teaching

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In today's society, professionals face demanding requirements. Increasing internationalisation, increasing use of information technology, and a new organization of work based on networks and teams have extended the range of abilities needed in professional work. Higher education environment is confronted with the same demands like working environments. Atkins (1995) suggested that the general purposes of higher education include: (1) providing a general educational experience of intrinsic worth in its own right, (2) preparing students for the creation, application and dissemination of knowledge, (3) preparing students for a specific profession, and (4) preparing them for general employment. These general aims may be divided into sub-components: for example, critical thinking skills and the ability to think conceptually are included into general educational experience; preparation for knowledge creation, application, and dissemination involves acquisition of the conceptual frameworks of the subject studied, deep knowledge of some aspects of the subject, an understanding of the subject's methods, and experience with knowledge creation (Atkins, 1995).

These types of general and specific knowledge and skills are widely accepted as aims of higher education. However, educational practices in general, and practices in higher education in particular, have been criticized for not developing these prerequisites of professional expertise (Paivi Tynjala, 1999). In traditional forms of university instruction, students often acquire inert knowledge that can be used in instructional settings but cannot be transferred into complex problems of working life (Mandl, Gruber & Renkl, 1996). Also, the university professors often do not act like experts in their instructional setting and the theories about good teaching do not include the results of research on expertise in pedagogy and in other fields. Another critic is made by Bereiter & Scardamalia (1993) who noted that the design of the educational system looks as if its purposes were to produce non-experts rather than experts. Experts often work in teams; they communicate and share their knowledge with colleagues in pursuit of common aims; they search for new knowledge, apply it, and transform it for novel uses. In contrast, students in schools and colleges work mainly individually, are often forbidden to cooperate and share their knowledge with peers (in examinations), and are encouraged to simply memorize and reproduce the knowledge they have acquired (Paivi Tynjala, 1999).

An important challenge to today's higher education is to develop instructional practice that is grounded in recent accounts of the development of expert knowledge. The present study represents an effort to develop such instruction. Its purpose is to examine more deeply some aspects of the nature of expertise and then to present the relevant characteristics of experts and novices in teaching field.

The expert is a person who obtains consistent superior performance ( $+ 2\sigma$ ) in solving critical tasks of his field of activity. Studies on expertise have proven that there are several characteristics that differentiate experts from novices in a certain field. Experts employ a larger volume of knowledge with a flexible, problem-solving organisation. By contrast, novices possess a reduced volume of knowledge that is organised according to peripheral elements (source, context, feelings). Taking into account problem solving strategies, experts resort to prospective reasoning and possess strong heuristics. On the other hand, novices are characterised by retrospective reasoning. Experts have superior meta-cognitive abilities unlike novices who do not have well developed meta-cognitive abilities. Considering the aspect of information processing, experts process information at a deeper level and the novices are characterised by a superficial one.

Several studies have investigated differences between expert and novice teachers. Their studies reveal that in general, novice teachers define good teaching in terms of personal characteristics of teacher, children's involvement, and affective features of classroom interaction. Expert teachers define good teaching more in terms of lesson structure and teaching strategies (Calderhead & Kagan, 1998). Regarding the base of knowledge, some teachers seem to have developed rich, well-organized knowledge bases, as a result of experience, that enable them to draw readily on their past experiences (Carter, Sabers, Cushing, Pinnegar, & Berliner, 1987). As in studies of human expertise in other fields, it has been found that teachers have a highly developed but domain-specific knowledge base (Ericsson & Lehman, 1996). The novice has a more discrete and disorganized knowledge base.

Westerman (1990) found differences between the thinking and decision making of the expert and novice teachers in the areas of integration of knowledge and interaction among the stages of decision making. The experts demonstrated an ability to combine or integrate new information, and they were constantly aware of behavioural cues of students telling them to change their approach to maintain the flow of the lesson. The mental representations of the expert teachers appeared to be based on a comprehensive view of the classroom. The results of other studies suggest that declarative knowledge develops in complexity from novice to expert. The expert teacher pulls from their rich store of classroom knowledge to diagnose the classroom; in contrast to student teachers that tended to give raw descriptions (Gonzales & Carter, 1996). Expert teachers, on the other hand, seemed to use their experience and domain-specific knowledge to make sense of an event, in an integrated way. The expert teachers have better developed knowledge structures with which to make sense and planning decision making. As Berliner (1988) indicates, the expert teacher perceives the classroom in more holistic and interconnected terms. Besides, the expert teacher's knowledge and practice is characterized by flexibility. Bransford and Berliner (2001), reviewing studies on teaching expertise, consider that expert teachers represent problems in qualitatively different ways than do novices; expert teachers may begin to solve problems slower, but they bring richer and more personal sources of information to bear on the problems that they are trying to solve.

The analysis presented in the paper has two main objectives. The first one is to point out the importance of the investigations on expertise in teaching, a domain which is insufficiently explored but it has numerous implications for the improvement of educational theory and practice. Studies in the field show that it is very useful for the development of expertise in teaching to employ a series of methods like the study case method, to develop automatisms in teaching, to identify and to make explicit the teacher's meta-cognitive abilities. The second goal that this study has fulfilled is to argue the hypothesis that the characteristics of experts in teaching are similar to those of experts in other fields (chess, medical diagnosis, physics problem solvers, etc.). Moreover, we can conclude that there are no differences in the cognitive components of expertise in teaching and those of expertise in other fields. Consequently, a programme of developing expertise in teaching should focus on intervention on the volume and the type of organisation of knowledge, on problem solving strategies and meta-cognitive mechanisms. The context of teaching also plays an important role in the development of teaching skills. An institution wishing to have experts in teaching must elaborate and promote policies that stimulate and reward the teachers who are interested and who initiate activities for their professional development.