



PROFESSIONALIZING TEACHER EDUCATION WITH CASE BASED REASONING

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Abstract

Case Based Reasoning is explained by Kolodner (1992) as a reasoner remembers previous situations and solutions similar to the current one and uses them to help solve the new problem. If student-teachers are taught to adopt Case Based Reasoning as an approach in solving classroom management problems and then when they are faced with new problems as beginner teachers this approach will help them to study previous situations and understand how they were solved. Therefore, the idea is to develop in student-teachers with necessary abilities to solve classroom management problems through a Case Based Reasoning approach. This pedagogical intervention in teacher education programme may help in developing quality educators. To successfully adopt this approach, a case library should be constructed. A case library consists of genuine stories about how experienced in-service school teachers have solved classroom management problems. These stories are to be supported with necessary theoretical inputs, prior experiences, expert opinions and worked examples extrapolating how the experienced teacher found the solution to the problem. In a case library the stories are categorised and indexed. These stories in the case library could be accessed and could retrieve similar cases which are then for the perusal of the learner to enrich their knowledge. Taking these prior experiences as a base, the novice teachers can make informed decisions by adopting or adapting or even find another solution to the problem thus promoting Case Based Reasoning.

Keywords: Case Based Reasoning, Classroom Management Problems, Problem Solving learning Environment



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Introduction

Classroom management, including both instructional and behavioural management, is a significant issue for teachers, school leaders, system administrators and the public (Egeberg, Mc Conney & Price, 2016). Classroom management is the process of ensuring that classroom lessons run smoothly despite of disruptive behaviour by students (Al- Zu'bi, 1988). The student-teachers who are not equipped with required classroom management skills, problems will crop up because classroom is the place where closest interaction between teachers and students take place (Muhammad and Ismail, 2001). Marzano, Marzano and Pickering (2003) called teachers as 'classroom managers' who solve numerous problems

ensuring successful knowledge transfer. Knowingly or unknowingly, teachers use problem solving skills in classroom for a range of ill-defined problems. Effective teaching and learning cannot take place in a poorly managed classroom (Marzano, Marzano and Pickering, 2003). Situations like these will test the classroom management abilities of a teacher as they are the “most important factor affecting student learning” as found out by the study conducted by Wright, Horn and Sanders, (1997).

The main aim of pre-service education programme is to create professional competence in teachers (Smith, 1980). Teacher education programme is a planned and organized educational programme to develop student-teachers with necessary knowledge, attitudes, behaviour and skills they need to transfer knowledge efficiently and effectively in the classroom. In India, teacher education programme is defined by National Council for Teacher Education, “training of persons for equipping them to teach at pre-primary, primary, secondary and senior secondary stages in schools, and non-formal education, part-time education, adult education and distance (correspondence) education courses” (NCTE, 1973).

The most common concern of beginning teachers is classroom management (Ganser, 1999). Instruction in a teacher education programme in India mainly comprise of pedagogy and its applications during teaching-practice. However, in developing teaching skills in a student-teacher the most important component known as classroom management is sidelined. Eisenman, Edwards & Cushman (2015) point out the reasons as for the difficulty lie in the lack of attention to the field by the profession, lack of formal preparation in the field by most teachers, and the lack of reality-based pedagogy in many teacher education classrooms. Without necessary classroom management skills, a teacher might take decisions based on instincts than follow a systematic procedure. Hence, a student-teacher must be trained to face these ill-defined problems by equipping them with appropriate abilities for classroom management.

Classroom Management Problems

Problems are everywhere and most of them are ill-structured. Ill-structured problems have unclear goals and incomplete information (Voss, 1988). Problems related to classroom management are ill-structured because problems that may arise are uncertain and unpredictable. Ill-structured problems inevitably occur in a classroom & due to the interaction that takes place between students and teachers. If the instructors are not able to solve the problem that creep up, then the teaching-learning process is at a loss. The finding of the study conducted by Wright, Horn and Sanders, (1997) supports that if the efficiency of

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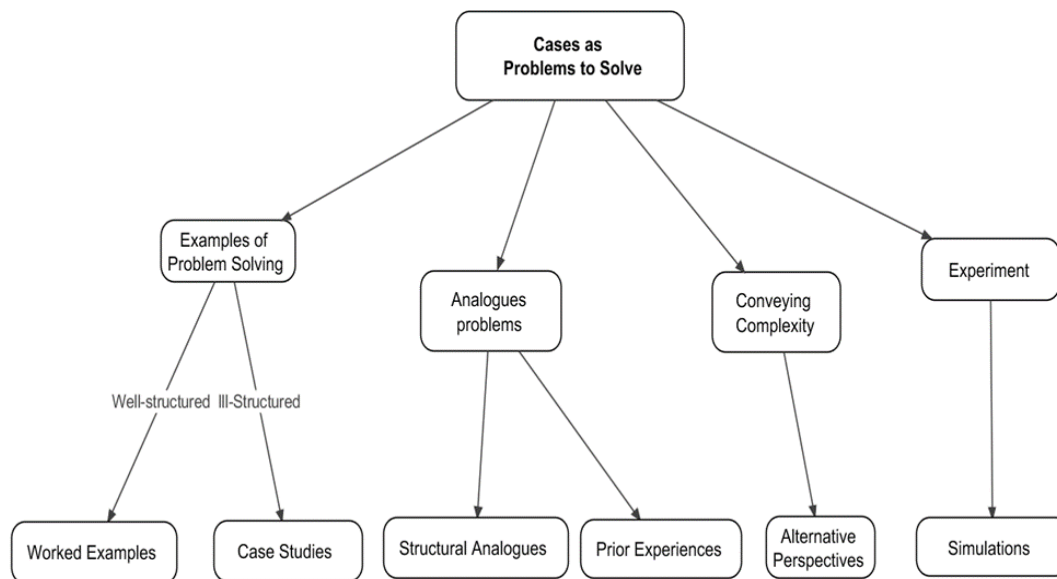
teachers is improved, then they can perform better in the classroom. Therefore, a well-managed classroom takes a great effort to create and the person who is most responsible for creating it is the teacher (Marzano, Marzano and Pickering, 2003). Thus, a teacher who is equipped with classroom management skills can resolve effectively and efficiently the issues in a classroom which prevents teaching and learning.

Lack of training of student-teachers in classroom management can impair their abilities in solving classroom management problems. A study conducted by Peretz, Eilam & Pardo (2011) found out that, "All five teachers think that the classroom management courses offered currently in teacher education programs in universities and colleges are too theoretical and do not equip future teachers with the necessary tools to cope with the actual realities in the classroom. Rachel (graduate of Tel Aviv University), a first-year teacher in the school stated: 'It was a waste of time, I didn't learn anything during the course which helps me today as a fifth-grade homeroom teacher'." Although many studies have been conducted on understanding classroom management problems, very few and unreliable strides are made to incorporate this component in pre-service teacher education. The inability of the student-teachers to comprehend and find effective solutions to classroom management problems contribute to the ineffectiveness in the practices of the teacher (Wong & Wong, 2014). These ill-defined problems affect teaching-learning processes.

Cases as Problems to Solve

According to Kolodner (1992), "Cases which represent specific knowledge tied to specific situations, represent knowledge at an operational level; that is, they make explicit how a task was carried out or how a piece of knowledge was applied or what particular strategies for accomplishing a goal were used". Cases could be understood as experiences of a person in certain situations. However, not all experiences can be determined as cases. "Cases worth remembering, then, are experiences that are different in some way from what was expected. They record major variations from the norm."

FIGURE 1: CASES AS PROBLEMS TO SOLVE (JONASSEN, 2011)

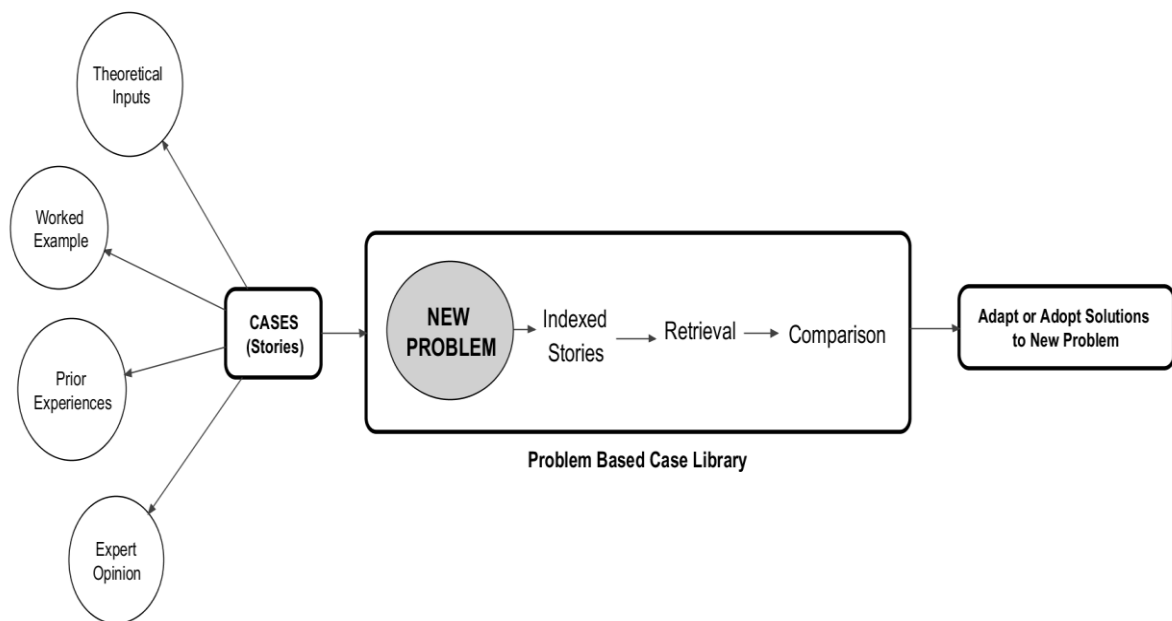


As Jonassen (2011) puts it, “Cases, (a) as problems to solve are instances of problems that will be the focus of learning, (b) as worked examples are instances of the process for solving well-structured problems, (c) as case studies are instances of how others have solved ill-structured problems, (d) as analogies are instances of structurally similar problems, (e) as prior experiences are descriptions of previously solved problems that are reminded by the problem to be solved, (f) as alternative perspectives are instances of different perspectives on the problem to be solved, (g) as simulations are interactive instances of the problem to be solved that can be experimented with by learners”. Figure 1.1 shows the cases as problems to solve given by Jonassen (2011).

Problem Solving Learning Environment

Problem solving is difficult and an intricate way of learning (Jonassen & Serrano, 2002). It is a cognitive ability in which correct or appropriate processing of mental information is critical to successful performance (Carroll, 1993). Cognitive tasks are processes that form mental contents which function to produce a response. These tasks may be reasoning, problem solving, planning, organizing, abstract thinking, etc. Therefore, cognitive ability is a person’s capability to understand the nature of complex problems and take actions accordingly.

FIGURE 1.2: PROBLEM SOLVING LEARNING ENVIRONMENT (PSLE)



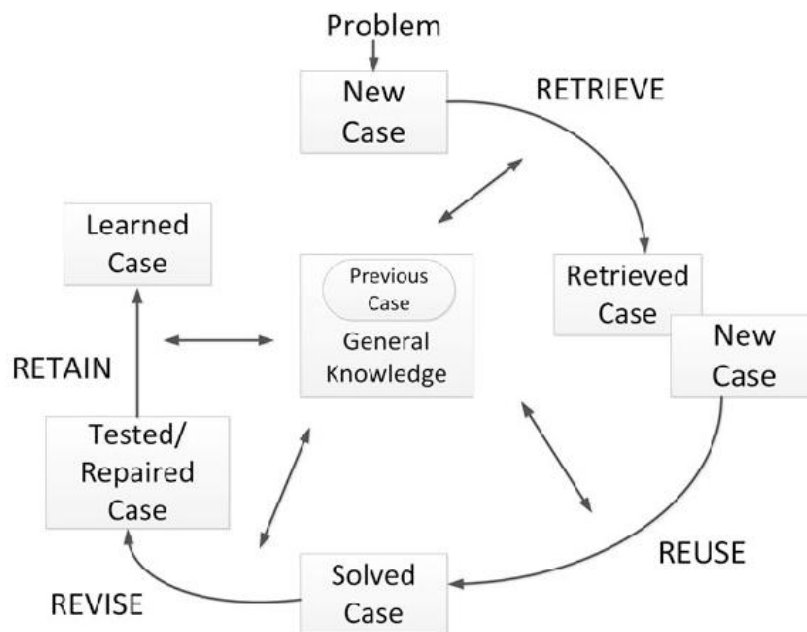
Cases are the building blocks of Problem-Solving Learning Environments (PSLEs), (Jonassen, 2011). Problem Solving Learning Environment (PSLE) consist of problems to be solved which are represented as cases. Worked examples, case studies, structural analogues, prior experiences, alternative perspectives, and simulations are all examples of cases that may be embedded in Problem Solving Learning Environment (PSLE) to support the solution of the problem to be solved (Jonassen, 2011). As shown in Figure 2, cases are stories and to solve these cases certain scaffolds are necessary such as theoretical inputs, prior experiences, worked examples, expert opinions, etc which create a Problem-Solving Learning Environment. Each case has its own Problem-Solving Learning Environment (PSLE).

Case Based Reasoning

Case Based Reasoning (CBR) addresses issues in memory, learning, planning and problem solving (Slade, 1991). Kolodner (1992), explained that the efficient way to solve problems is through Case Based Reasoning. “Case-based reasoning means using old experiences to understand and solve new problems” (Kolodner, 1992). The quality of a case-based reasoner's solutions depends on four things; (a) the experiences reasoner has had, (b) ability to understand new situations in terms of those old experiences, (c) adeptness at adaptation, and (d) adeptness at evaluation (Kolodner, 1992). Here, a problem solver remembers the prior situations that resemble the present situation and uses them effectively to solve problems. Aamodt & Plaza (1996) pointed out that an encountered problem prompts the

reasoner to retrieve cases from memory, to reuse the old case, which suggests a solution. If the suggested solution will not work, then the old and or new cases are revised. The Case Based Reasoning Cycle is given by Aamodt & Plaza (1996) in Figure 1.3.

Figure 1.3: Case Based Reasoning Cycle, (Aamodt & Plaza, 1996)



Conclusion

All researchers related to Case Based Reasoning have assumed that stories can function as a substitute for direct experience, which novice problem solvers do not possess. Supporting learning with stories can help students to gain experience vicariously (Jonassen & Serrano, 2002). Lave and Wenger (1991), found stories to be critical also for initiating new members into a practice. Relating and listening to stories was the most important element in learning as proposed by (Schank, 1990). Acknowledging this fact that stories can act as substitute for vicarious experiences we propose to construct a case library to serve as a repertoire of live problem solving and instances.

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