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IMPLICATION IN TEACHING A LEARNING RESEARCH

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ABSTRACT

This paper is a summary of the key findings of two reports recently commissioned by the Office of Learning and Teaching. The Faculty of Education at Monash and the Australian Youth Research Centre in the Faculty of Education at Melbourne University scanned the literature on teaching and learning to identify the major trends relating to research, theory and practice. This is a snapshot of their research findings.

The paper is organized into two sections. The first section looks at the major trends in pedagogical thinking; life-long learning, changes in theories of learning, deep understanding and concept formation. The second section identifies various teaching and learning practices that reflect these new ways of thinking; collaborative learning, learning communities, rich tasks, assessment practices and ICT.

"Learning is concerned with promoting skills and competences necessary for developing general capabilities and specific performance in work situations. Skills and competences developed through programs of lifelong learning are vital for workers performance in their tackling of precise job responsibilities and how well they can adapt their general and particular knowledge and competences to new tasks."

Finding ways to encourage lifelong learning, through workplaces and beyond formal learning contexts, is a growing concern of all nations, including Australia (International Labour Organisation 2000). Lifelong learning formally begins in the pre-school years. Students' formative years are of crucial importance in learning how to learn, stimulating the motivation to engage in further learning and building the skills for effective lifelong learning.

INTRODUCTION

Students of today face a future that will be very different, in unimagined ways, from the present. They will need to be flexible and cope easily with diversity and ambiguity. They may be asked to function in both local and global communities, arriving at decisions after due consideration of evidence and possibilities. They will be expected to work in innovative ways as members of professional learning teams, actively researching their practice and contributing to the growth of these teams. The problems that they will encounter in other learning context, will require cross-disciplinary thinking and complex problem-defining and resolving skills.

As adult learners, our future learning citizens will therefore have their creativity and resourcefulness stretched, and they will regularly face ethical and moral dilemmas that will necessitate the taking of an informed position (Duch et al. 2001). This will require them to feel able to function as confident and

capable learners who are able to think critically, creatively and reflectively. According to Ritchhart (2001) these three aspects of thinking together encompass much of what is advocated as productive and worthwhile habits of mind, such as scepticism and being strategic (strands of critical thinking); being metacognitive, that is aware of your own way of thinking, and a seeker of truth (components of reflective thinking); and being open-minded, remaining ever-curious and asking 'what if … ?'questions (core strands of creative thinking).

Lifelong learning has to take account not only of the multiple settings in which learning occurs but also the ways in which these settings influence or determine the forms of knowledge. School curricula must thus take on the challenge of developing young people's confidence and skills to enable them to become effective lifelong learners. Such a re-thinking of school curricula might involve what the English curriculum theorist Michael Young calls 'new forms of knowledge relationships' that are developing between disciplines and subjects, between subject and non-subject knowledge, between theoretical understanding and practical application, and between school and non-school learning.

DEEP THEORETICAL KNOWLEDGE AND UNDERSTANDING

Surface knowledge and learning has been characterised by Meyer (2000) as unreflective studying of a fragmented curriculum, unthinking acceptance of texts or other authorities and memorizing without understanding. Deep knowledge and learning, by definition, seeks to reverse these practices. It requires time to study in depth a limited number of topics and subjects. It demands an enquiring and analytical approach to information and interpretations, and it requires subject expertise on the part of teachers.

The most significant development in 21st century pedagogy is likely to be the shift toward curricula, teaching and assessment that favour deeper theoretical knowledge and learning. As Weigal argues we may well be in the initial stages of a revolution in learning that combines richness with accessibility and in so doing parts company with the dominant educational motif of surface learning. Nonetheless, surface learning continues to prevail in many subject fields. Despite the advances that had already been made towards deep learning in mathematics, the American researcher John Bruer suggested in the early 1990s that many students don't know why the math procedures they learn in school work Too often, math instruction produces students who can manipulate number symbols but who don't understand what the symbols mean. Research in the field of science education has found that although older students can use more science terms than younger students, they may decline in their understanding of fundamental concepts. Building on these critiques, Graesser et al. note that 'what is missing are the deep, coherent explanations that organize the shallow knowledge and fortify learners for generating inferences, reasoning, and applying their knowledge to practical situations'.

There is mounting evidence about the positive impact of deep learning strategies and methods on student performance. Longitudinal research has involved large cohorts of students from nineteen different schools in disadvantaged areas in Chicago USA. The findings showed that assignments offering authentic intellectual challenges to students contributed markedly to students' performance in

basic skills tests. Low expectations of students and concentration on 'basics' at the cost of student intellectual development were detrimental to students' success.

COLLABORATIVE LEARNING

Collaborative learning has been practised in schools for many decades. There is much professional expertise and experience in developing strategies for collaborative learning. There is a robust research tradition addressing a myriad of issues to do with collaborative learning, from the pioneering work of Vygotsky and early researchers to studies investigating the links between new pedagogy and information technology. However, there are limitations in the research: only a few studies suggest that working in a small team achieves cognitive outcomes that cannot be matched or exceeded by the most capable group member (Schwartz 2001:197). Nonetheless, collaborative learning has been shown to be a more effective way of learning than individualized or competitive learning (Slavin 1983; Johnson & Johnson 1987). The American researchers Johnson and Johnson concluded that: If student-student interdependence is structured carefully and appropriately, students will achieve at a higher level, more frequently use higher level reasoning strategies, have higher levels of academic motivation, be more intrinsically motivated, develop more positive interpersonal relationships with each other, value more the subject area being studied, have higher self-esteem, and be skilled interpersonally.

ASSESSMENT PRACTICES

Critical to any initiative in teaching and learning are the accompanying assessment practices: 'assessment is frequently the engine that drives pedagogy and the curriculum' (Hildebrand 1996:149). It shapes learners' motivation, their sense of priorities and their learning tactics. Assessment practices should not be tacked on as addenda, but integrated into the teaching-learning-curriculum design process.

Stiggins (2001) presents a case for students to be actively involved in their own assessment in order to enhance their learning. Newmann (1996) goes further when he defines authentic achievement as that which involves significant and meaningful work that produces new knowledge, not merely reproducing received wisdom. He argues that where students have opportunities to engage in realwork, relevant to their lives, teachers will be 'more likely to motivate and sustain students in the hard work that learning requires' .Arter and McTighe also suggest that teachers should learn how to develop and use more explicit performance and scoring criteria which can be powerful instructional tools for improving the very achievement that is also being assessed The idea is simple – teach students the criteria for quality and how to apply them to their own work to make it better.

Today, presenting and understanding one's own learning is an essential component of lifelong learning and involves a level of self-assessment that can be practised in schools (Wilson & Wing Jan 1998). Both formative and summative classroom assessment should therefore play an important part in any changes to curriculum reform or to the introduction of new learning theories to classroom teaching.

ICT

There is a growing body of evidence suggesting that particular applications of ICTs in educational contexts can advantage learners and facilitate teaching. Considerable discussion about new pedagogies seeks to identify some wholesale changes in the ways that educators ought to frame their work, and while such a theoretical summary would be useful, it is clear that the advantages to students using ICTs can be seen in specific situations. Overall, studies have shown that:

- Higher order thinking skills improve with home and school access to computers;
- Student collaboration through software applications can improve problem solving, and the quality of discussions;
- ICTs provide different and effective opportunities for communication, and developing communication skills;
- ICTs used within the process of knowledge construction, programming, and reflection provide particular reasoning and problem solving challenges that are relevant and effective.

From the point of view of curriculum, there are two principal issues: learning about ICTs, and learning with ICTs. The first of these includes learner understandings of the ways that ICTs impact society, and how values and power are implied and communicated through technology. This is a departure from the view that technical skill and knowledge of the working of machines is the extent of this domain.
The second issue locates ICTs within the pedagogies of other fields. To some extent there are generic aspects which include communication, project management, publishing, managing digital artefacts and problem solving with ICTs. There are also implications for specific ICTs in some curriculum areas that include simulation, demonstration, and programming. An opening up of the curriculum to

CONCLUSION

The demands of a knowledge economy have prompted a renewed focus on learning and teaching. As a result there are alternative pedagogical models which challenge learning and teaching as institutionalized in schools. These models stress the importance of the socially situated nature of learning; positioning learners as collaborating in the creation of new knowledge and the development of new skills. By sharing experiences and constructing knowledge with others, learners are developing significant forms of social and academic competence. A focus on the social nature of learning is integral to a vision of a democratic society and an actively engaged citizenry. Across all learning sectors, research is emphasising the importance of developing new approaches that involve deep theoretical knowledge and understanding and the cognitive and affective aspects of teaching and learning.

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