

6. A PROCESS PERSPECTIVE OF COLLABORATIVE PROBLEM SOLVING

INTRODUCTION

Over the past 20 to 30 years technology has become embedded in education in a manner almost as familiar as a textbook, the whiteboard, desks and pencil and paper. We continue to search for ways to respond to and identify social and cognitive skills that students are expected to develop to enable constructive living in a C21 global context. We are variously affected by a series of industrial revolutions and the tensions arising from the pressure to change when conservatism would have social structures retained. These pressures are felt in every household, classroom and workplace. In response we may need to explore the implications of social roles of education as either social reconstruction or social reproduction.

Curriculum from a social reproduction perspective is expected to help students to become citizens capable of functioning responsibly in an existing society. It aims to reproduce and sustain the status quo. A premise of a social reproduction curriculum is that it is not the role of education to critique society. Education in that paradigm is expected to provide information and skills necessary for the student to function well in an existing society. Social reproduction can have the effect of reducing teachers to become specialised technicians whose role it is to implement and manage the curriculum rather than develop the students as critical and competent members of society. The skilled technician teacher helps to perpetuate the implementation of the social reproduction curriculum which is based on content which the teacher transmits, and the students absorb. This is not the case in a competence model of education such as would be expected in contexts where problem solving, critical thinking and collaborative competencies are expected to be evident and to flourish.

Competency-based education represents a paradigm change a teacher's role from a transmissive to a transformative one. The scope and focus of the competence focused education will, in many societies, be controversial. Social reconstruction is diametrically opposed to social reproduction and the role of the teacher falls into two fundamentally different paradigms.

A competence approach to education involves active participation by 'doing'. It involves being able to monitor what students do, say, make or write as evidence of development. The 'doing (say, make or write)' is not drill and practice, or even completion of specific projects that the students define. In a competence model the

school becomes a community to help the students develop attitudes, values and habits useful in improving the community. The competencies they develop must be interrelated. Separating one from another may be difficult given the infusion of social, ethical, aspirational competencies as well as skills in the overall competence performance.

Priorities need to be established and then a strategy is needed to ensure that the competencies are embedded in learning and teaching. Hence it may be more important to understand the process of competence demonstration and development rather than an outcome dichotomy of success or failure. The latter is characteristic of an industrial era of education and a content based curriculum feeding a social reproduction role. A competency focused curriculum emphasises quality of performance and leads to a reconstruction role. The two paradigms of education roles contradict each other in ways that are irreconcilable.

In a content based curriculum the teacher is expected to be a skilled technician; in the a competence focused social reconstructive curriculum the teacher is expected to be an autonomous transformative collaborator. Social reproduction and social reconstruction in education cannot coexist. These roles are alternatives, not supplementary. Hence systems of education must make a choice. Does the system move to a competence model with the aim of preparing society to live in aftermath of the fourth industrial revolution where intelligent machines are replacing human skills or does it continue with a reproductive approach with the goal of maintaining the status quo?

ATC21S

It is within this context that the project known as the ATC21S emerged in 2008. Three large digital corporations, Cisco, Intel and Microsoft were concerned that education was not changing commensurate with the pace of change in the workplace. Their “Call to Action” led to an exploratory workshop attended by than 250 researchers and industrialists in 2009 with the aim of exploring the needs of education in a C21, post-industrial context. The group defined the issues in terms of new ways of working, new tools for working, new ways of thinking and living in a digital world. By 2015, several global organisations such as the World Economic Forum, the Economist, the New York Academy of Sciences, European Network of Schools, International Labour Organisation, UNESCO, and the OECD all became actively engaged in the search for new directions in education that would enable schools to prepare citizens for a new and constantly changing society.

Several key ideas were common and constant across almost every analysis. The emphasis was placed on the development of competencies such as critical thinking, problem-solving, collaboration, creativity, and communication. It also became clear that citizens had to become increasingly familiar with scientific thinking, use of technology, coding and engineering of ideas and absolute mandatory were the development of communication competencies and application of mathematics.