Chapter 59

# Towards Realizing Twenty–First Century Skills:
## Deliberate Scaffolding of Metacognition in Instruction

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## ABSTRACT

*Metacognitive capabilities are the core of the "soft skills" we have come to know as twenty-first century skills. However, there is good evidence, both empirical and anecdotal, that metacognitive capabilities are not well developed even in university graduates. Given the recognition of the necessity of such skills in enabling full participation of individuals in modern society, and in enabling humankind as a whole to continue to move forward in positive ways, the need to better nurture the development of metacognitive capabilities is pressing. The massification of education and the widening participation of people in higher education means that formal education can more greatly influence and shape people's learning capabilities. Given appropriate instructional design of experiences, education has thus great potential for setting people up to continue effective learning throughout their lifespan. Developing metacognition requires designing instructional experiences targeting not only discipline requirements but also deliberately scaffolding the development of metacognitive capabilities as an integral component of the discipline.*

## INTRODUCTION

Conduct a web search using the keywords "21st century skills" and one is inundated with relevant results. The author conducted such a Google search in September 2017 and was rewarded with "about 133,000,000 results" – albeit some of the results towards the end of the list may likely be less relevant but a glance to page 47 of the search results continued to provide highly relevant results. The results covered a wide cross section from how educational contexts in early childhood through to university through to specific professional areas and disciplines. Clearly, 21st century skills is the catchphrase of our times. There is obvious (and well-justified) concern, across all disciplines and work domains, for how people can be

best equipped to both respond to contemporary conditions, and drive further progress. Permeating the numerous and varied checklists of skills and discussions are two common themes:, 1)The 21st century is a time of increasing complexity and change as has never before been seen in human history- that complexity and change is being made possible largely through the digital revolution; 2) higher order skills (such as self-regulation, critical thinking, independence in learning), communication, collaboration and creativity are considered necessary of 21st century capabilities for the broader population.

Despite widespread recognition of the need to develop 21st century capabilities in the population, it is apparent that there is a need better develop these skills. PayScale's 2016 Workforce-Skills Preparedness report, based on a survey of 63,924 managers and 14, 167 recent graduates in the U.S., states that among the most lacking soft skill among graduates (as reported by employers) is critical Thinking / problem solving (60% of employers). Other reported lacking soft skills included: Attention to detail (56% of employers), Communication (46% of employers), Ownership (44% of employers), Leadership (44% of employers), Interpersonal skills/teamwork (36%). What is also of concern is that while 25% of recent graduates felt "extremely prepared" for employment, only 8% of managers agreed (Strauss, 2016). Of both the hard and soft skills covered by Payscale's report, critical thinking/problem solving was demonstrated to be the skill that the greatest number of employer's felt was lacking.

Reports such as PayScale's provide empirical evidence of the deficit in higher order skills in graduates but it is not difficult to find other anecdotal evidence of the deficit. Within the author's experience, a conversation with one employer unfolded in this way:

*"What are these students being taught?" the prospective employer questioned. The tone of his voice simultaneously suggested annoyance and disbelief. A recent graduate had scored an interview with a media development company. One major interview task was to design a company logo and webpage according to the given brief. The graduate had executed the software skills to perfection, but had failed to be attentive to (or perhaps did not understand) the requirements given in the brief.*

The author has had conversations with a number of other employers and the message is much the same – their employees are lacking in 'thinking skills', 'problem solving' and the ability to self evaluate and self regulate.

The sentiments of the employers spoken to are echoed throughout the education system, particularly in higher education. Of those of us who are educators there are not many who have not heard student comments along the lines of the following:

*A student submits an assessment item two weeks after the due date via email, saying, "Sorry I forgot it was due and it took longer than I'd planned."*

*A rather disgruntled student, on return of her assessment item remarks: "Why did I only get a pass for this work. I put lots of work in it and I should get more marks. I was expecting at least a distinction."*

Bringing together evidence of the apparent deficits in higher order skills with the well established necessity of developing such skills in the 21st century to the benefit of individuals and society as a whole, makes very obvious the need to address the issue. At a time when participation in formal education is widening, and the length of time people spend in formal education is increasing, it is important to

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