

## Chapter 5

# The Use of an Online Adaptive Learning Platform as an Adjunct to Live Simulated Clinical Encounters

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### ABSTRACT

*Adaptive learning platforms that individualize each learner's experience according to their input have only recently become widely accessible. This chapter illustrates some of the potential of adaptive learning platforms and describes a case study where this emerging technology has been used with physiotherapy students in a simulated clinical setting. Aspects of patient care scenarios presented with an adaptive learning platform were interleaved with live simulated patient interactions. Evaluation of the projects and the benefits and challenges of using adaptive learning platforms in biomedical education are discussed.*

### INTRODUCTION

The intention underlying adaptive learning is to provide an environment which fits learning experiences to the needs of the students by responding or adapting to that individual student's needs and input. Adaptive learning is often considered to involve interactions with computers, but the idea that education is individualized and that an educational input is dependent on the output from the individual learner existed long before the advent of computers. In Socratic teaching, for example each

DOI: 10.4018/978-1-5225-3850-9.ch005

question is informed by the response of the learner. Similarly, in the Oxford tutorial method the directions of the small group discussions are dependent on responses of the learners. Another historical version of individualized education was described in John Stuart Mills' 1873 Autobiography (<http://www.gutenberg.org/ebooks/10378>) accessed March 6, 2017) where Mills, on daily walks with his father would summarize his previous days reading. These summaries led to discussions, what would now be called teaching moments, and suggestions of further reading. As time went on, Mills taught his younger sister what he was learning with the interesting twist that the sister would recount her learning to the father and the father feedback to both his son and daughter on the learning. All of these methods seem to be effective, are highly individualized and learner-centred, but are difficult to apply with large numbers of students.

In any group of students, there will be individuals with different needs and understandings; and who learn at different rates or from different frameworks. A challenge when teaching large numbers of students is how to present the material to maximize the learning of all students without leaving some students behind and/or risking boredom in others. It is not possible for all students to have the amount of time from an individual mentor that John Stuart Mills had, so attempts were made to develop automated ways of assisting student learning. The earliest learning machines are the precursors to today's computer based adaptive learning. Learning machines were defined as "an automatic or self-controlling device that (a) presents a unit of information ..., (b) provides some means for the learner to respond to the information, and (c) provides feedback about the correctness of the learner's responses." (Benjamin, 1988) By this definition the earliest learning machines were produced in the 1920's by Pressey (Benjamin, 1988). His machines required students to respond to a multiple choice question; once a correct response had been selected they could move on to the next question. The number of attempts and the number of correct responses could be recorded and a reward of sweets could be provided to the student after a predetermined number of correct responses. Nonetheless, B. F. Skinner is often credited with the earliest learning machine in the 1950's. These devices required the student to enter the text of an answer and assisted students with a series of small hints until the student produced the correct answer. Importantly these hints occurred regardless of which incorrect answer was written and were not specific to the answer provided by the student. There was considerable controversy about the early teaching machines and their use all but died out by the mid 1960's, just as computers were about to come into common use.

The development, diversity, and theoretical underpinning of computer based education over the last forty years is far beyond the scope of this chapter, but it is worth briefly considering some of the influences. With the increasing sophistication and accessibility of computers from the late 1970's, there were two streams that

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