

## Chapter 4.7

# Assessment of Students by a Teacher with a Handheld Device and a Networkable Database

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### LEARNING OBJECTIVES

1. Distinguish between objectivism and the constructivist educational philosophy.
2. Name the three areas of change that have prompted consideration of new systems to support assessment.
3. Locate the five research questions in the text and determine how you would begin to explore the issues.

### ABSTRACT

*For more than a decade, Australian educational systems have been trying to implement curriculum based on an outcomes approach to teaching and learning. A major difficulty in this process has been in applying the approach to the assessment of students' learning. It has been recognized that teachers require considerably more support in access to information, collection of data, and*

*analysis of data. Much of this support will need to be provided through appropriate computer systems, more than likely using networkable portable devices. Unfortunately research and development into the implementation of such support is in its infancy although the technology is widely available. This chapter describes a pilot project that tested the use of personal digital assistant to collect and analyze assessment data at the point of demonstration of the learning outcome by the student and then provides a background and rationale for continuing research in the area.*

### INTRODUCTION

In the 1990s, significant developments in computer technology have been the emergence of low-cost, high-powered portable computers, and improvements in the capabilities and operation of computer networks (e.g., intranets and the accessibility of the Internet). These technologies have appeared

in educational institutions at an escalating rate. During that same period educational systems in Australia have been moving towards a more outcomes-based curriculum and investigating methods of efficiently and effectively assessing students from this outcomes perspective. Many educators in Australia and internationally perceive difficulties with implementing appropriate assessment processes for an outcomes-based curriculum with some hoping that technological support will overcome these difficulties. Portable computer devices in the hands of educators and connected to school administrative networks, particularly using wireless technologies, appear to be the best support in such a situation. Barrett (2001) and others see tremendous potential for the use of hand held devices to support performance and portfolio assessment processes in schools.

My interest in the use of computers to support teacher and school administrative tasks goes back to 1981 when I designed the first computerized attendance system to run on a microcomputer and used in a secondary school in Western Australia. It was programmed in standard BASIC and ran on an Apple II successfully for a number of years at the school at which I taught. Having never been enthusiastic about spending time on administration, since then I have always looked for ways in which computer technology can assist myself and others in these tasks. From my experience in teaching in a school between 1979 and 1986, where a serious attempt was made to implement a constructivist philosophy and assess students based on what they could do (i.e., outcomes-based), it became clear to me in the early 1990s that without substantial computer support this was impossible in a large school and certainly across a large school system. Further, this support needed to be ubiquitous and designed to work with the teacher and within typical learning environments. I believe that the best way to provide this is through Web-enabled database systems operating over wired and wireless networks to teacher workstations and hand held devices for

use in classrooms. Therefore I set out to test this hypothesis with the use of a Personal Digital Assistant (PDA) to support my assessment of teacher education students completing practical activities in an undergraduate ICT workshop environment. If successful, this would support a future research agenda to determine whether a similar approach was suitable for implementation in schools across large systems.

## **TRIAL WITH HAND HELD DEVICE**

In a compulsory first-year unit on computers and learning teacher education, students I was working with were required to complete a series of activities to demonstrate identified ICT skills and understandings that I, as tutor, was accountable for assessing. I developed a database solution and implemented it on a Palm Pilot PDA and piloted it in two semesters with a total of four classes of about 20 students per class. I used this system in every workshop to record the demonstration of the identified skills and understandings, monitor the progress of the students through the activities, and provide the unit coordinator with final assessment data. The system was successfully implemented on the Palm Pilot platform and synchronized with a desktop computer for backup and analysis of data. In the workshop environment I would make a formal tour of the laboratory at least once every workshop and use the Palm Pilot system to record student progress and to discuss further requirements with individual students. During each workshop the system would also be used to respond to ad-hoc student enquiries about progress and marks. As a result of using this system the students were not required to submit any of the practical activities either as hard copy or electronic copy. All of these activities were assessed by myself in the laboratory at the time of completion. This approach insured that students were assessed more in terms of their skills and understandings and the processes they

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