

Computer Professional Education using Mentored and Collaborative Online Learning

David Lindley

Australian Computer Society
Email: just_ask@acslink.net.au

Abstract

This paper discusses the rationale, design and online delivery of postgraduate education by the Australian Computer Society (ACS). Called the *Computer Professional Education (CPe) Program*, the education aims to fill the gap between university study and industry experience. It aims to improve the employment and career prospects of recent ICT graduates and Provisional Members of the ACS.

To achieve these aims, the ACS employs a teaching methodology describe as *mentored* and *collaborative*; meaning that, under the guidance of experienced IT educators and practitioners, students work individually and together to analyse and understand workplace situations and problems. And to support both its aims and its teaching methodology, it is delivered in a learning environment which is *anywhere anytime*, affordable, and based on students' own workplace circumstances.

At a technical level, the teaching methodology is based on Salmon's *Model of Online Learning* and built on the *Moodle* learning management system.

Presentation of this paper will include a demonstration of the CPe Program. For comparison with a different approach to online education, an example of technology

used to deliver the ACS Diploma of Information Technology will also be presented.

Introduction

This paper will discuss the *ACS Computer Professional Education Program* (CPe Program). In particular, it will provide a rationale for the program, the theoretical foundation for its design, and a brief description of its content, structure, and delivery. It will also outline plans for ongoing development of the Program.

The Rationale of the CPe Program

The Australian Computer Society (ACS) is a professional association and its members are, or should be, professionals. The definition of a profession given by *Professions Australia* stresses both the possession "of special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level as well as the possession of a Code of Ethics" (*Professions Australia*, 2007).

Important concepts in this definition are *knowledge* and *skills* which, for the purposes of this paper, are defined as *facts, information, and skills acquired through experience and education and the ability to perform a task*.

The ACS has a total of eight grades of membership with the most significant requiring a person to have; completed a degree at Bachelor level with a major in Information and Communications Technology; plus, at least 4 years' relevant professional experience (ACS, 2007).

Additionally, to differentiate themselves from other members by their contemporary and up-to-date knowledge and skills, a member can claim *Practicing Computer Professional* status if they complete the ACS CPe Program and every year undertake a minimum 30 hours relevant professional development.

The CPe Program, therefore, is central to the role of the ACS as a professional association.

Design

The types of people in the IT profession, and thus potential students of the CPe Program, include (from internal ACS documents):

- Practitioners; those directly engaged in the usage, delivery and management of ICT (both professionals and technologists, where technologists may not satisfy the ACS education and experience requirements for full membership),
- Educators; those developing and delivering educational, learning and development products and services for practitioners,
- Researchers and developers; of new languages and utilities, new hardware and peripherals, fundamentally new applications, new techniques and tools for IT practitioners,
- Supporters; those who regulate, provide legal and commercial support, and represent practitioners and their organisations.
- To offer a learning environment which for these people is both

challenging and motivating, the design of the CPe Program is underpinned by Knowles' *Theory of Andragogy* or "self-directed learning" (National-Louis University, 2005).

- The principles of andragogy are that;
- Adults need to be involved in the planning and evaluation of their instruction.
- Experience (including mistakes) provides the basis for learning activities.
- Adults are most interested in subjects that have immediate relevance to their job or personal life.
- And adult learning is problem-centred rather than content-oriented (Kearsley, 2007).

Applying the principles of andragogy specifically to online learning is *Salmon's Model of Online Learning* (Salmon, 2000). Through her work at the UK Open University, Salmon identified five stages through which successful students pass; beginning with *Access and Motivation* and then progressing through *Online Socialisation*, *Information Exchange*, and *Knowledge Construction* until reaching the stage of *Construction* where "participants become truly responsible for their own learning" (Holmlund).

In terms of content, the CPe Program is based on the principles of the appropriately-named *Outcomes Based Education* (OBE). Two essential principles of OBE are; "clarity of focus" and "designing back", or deconstruction from outcomes (Killen, 1998).

The teaching (or tutoring and mentoring) methodology used in the CPe Program is derived from the *Conscious Competence Learning Model* (Chapman, 2007) as illustrated in figure 1 below.

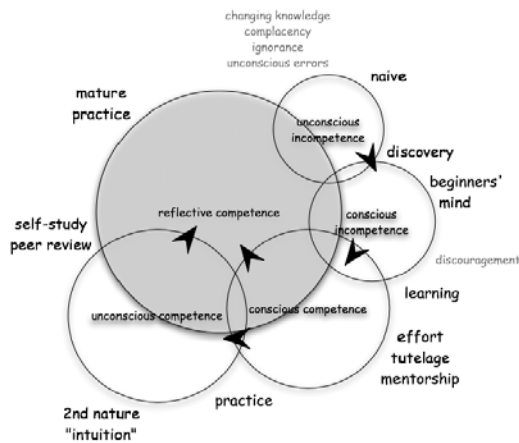


Figure 1: Conscious Competence Learning Model (Courtesy of Will Taylor, National College of Natural Medicine, Portland, Oregon, USA, March 2007)

Finally, and most importantly, the CPe Program is designed on the principle of *Reflective Learning*.

Confucius said; *by three methods we may learn wisdom; first, by reflection, which is noblest; second, by imitation, which is easiest; and third by experience, which is bitterest.*

With reflective learning, learners ask themselves questions like; what happened? why? what could have been? what can I do? how can I do it? And from the answers, they develop their plans for the future.

The reflective approach is useful for adult learners, particularly those engaged in professional and intellectually demanding activities. For those new to their professional roles, it offers opportunities to investigate, plan and consolidate; and for those with experience, it encourages thoughts unconstrained by routine and practice. (Hinett, 2006)

Delivery

The CPe Program is *collaborative* and *mentored* because students are supported throughout their study by senior ACS members to develop knowledge and skills along the lines of the *Conscious Competence Learning Model*. And consistent with *Salmon's Model of Online Learning*, students work in cohorts of 10 to 20 to discuss and debate career and professional issues of common interest.

Practical issues for delivery of the CPe Program are that its students are highly IT literate, usually in full-time employment, and with many responsibilities additional to their career and professional development. The students' IT literacy allows the Program to be readily delivered online and so overcome at least some the students' time constraints. However, such flexibility can lead to *in-discipline*, with students' losing focus under the pressure of many competing demands for their time.

Notwithstanding the andragogical underpinnings of its design, essential to the Program's success is an externally imposed discipline. This involves dividing every teaching week into two parts; from Sunday to Wednesday when students read and answer questions individually; and from Thursday to Saturday when students work together to discuss each other's individual answers. Both these activities are assessed and influence a student's final grade in a subject.

The content and structure of the CPe Program is developed in a deconstructionist approach along the lines of Outcomes Based Education. Each subject has outcomes defined from the *Skills Framework for the*

Information Age (SFIA), which is described as a “common reference model for the identification of the skills needed to develop effective Information Systems making use of Information & Communications Technology.” (SFIA 2007).

The CPeP subject *Business Strategy & IT*, for instance, is being re-developed to produce outcomes consistent with the SFIA skill sets *strategic application of information systems* and *professional development*.

Assessment in the CPe Program is based explicitly on the students’ reflections of their personal employment and professional circumstances. Assignments for instance, which constitute the bulk of the assessment load, all require the application of theory to personal experience, employment situations and career ambitions. The CPe Program is delivered on the *Moodle* platform described as “an ongoing development project designed to support a social constructionist framework of education.” To explain their meaning of *social constructionist*, the developers write ‘not only do the “shapes” of the software tools indicate certain things about the way online courses should work, but the activities and texts produced within the group as a whole will help shape how each person behaves within that group.’ (Pukunui Technology, 2005)

At a technological level, Moodle is developed in *Linux* using *Apache*, *MySQL* and *PHP* but is also regularly tested with *PostgreSQL* and on *Windows XP*, *Mac OS X* and *Netware 6* operating systems. The software is provided freely as *Open Source* under the GNU Public License.

Further Development

The CPe Program is still far from being a perfect system of education for working adults. Some of the more important

developments that are still necessary include a student induction course, a forum in which students record their readings (to be called a *Reading Wiki*), and a program of scholarly research to study the education programs of other professional associations against which to compare and evaluate the CPe Program.

Conclusion

This paper has discussed, briefly, the rationale for the ACS CPe Program, the theoretical foundation for its design, and its content and delivery. It has also outlined the Program’s potential student group and its ongoing development.

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