

The Value of International Standardisation of Basic Computer Literacy and Online Testing

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Abstract

There are three main objectives of the paper:

- *To review the quantifiable benefits of improving basic computer literacy to the mass of the population within the ASEAN region. Evidence will be given from the experience of the ICDL qualification in over 150 countries.*
- *To review the learning points from language and culture, translation of training and testing.*
- *To review the accuracy of assessment from different types of questions/assessments in an online test.*

The Key Issues

Basic IT skills are now becoming as fundamental to education as learning to read and write. However, currently about two-thirds of schools in the developing world have no computers and very few teachers trained to use IT. This means that many students are still coming into the workplace with no experience of IT even though buying and installing computers can be achieved relatively quickly and easily. Our task is to produce an efficient mass market low cost system to address the following 8 key problems;

Nations' Economic Growth: All nations are trying to share the benefits of a move towards a knowledge economy. Internet and e-learning resources can only be tapped into with the right skills. Whilst plans are in place to extend IT infrastructure, this will be of no benefit if the majority of the population are not capable to access it and use it productively.

The Individual: As previously mentioned basic IT skills are now becoming as fundamental to education as literacy and numeracy skills and without these key skills, individuals will lack equal opportunities as IT becomes prevalent in more and more areas of everyday life.

Capacity in Local Countries: The majority of schools in ASEAN countries are producing students coming into the workplace without formal training in IT and limited access to a computer. Compounding this, most adults in employment did not get any computer training either in the workplace or during their formal education.

Relevance to Employers: We must focus on skills which quantifiably improve efficiency in the workplace and target practical computer literacy skills not theoretical knowledge.

Affordability: Many programmes are simply out of reach of many societies due to the costs involved.

Localisation: Currently most available content is in English with case studies/examples from a western European context. Clearly, to improve IT access for ASEAN citizens of all ages and backgrounds, additional material must be developed within a local context.

Special Needs and Social Inclusion: Widening participation and social inclusion of under privileged individuals to enter a professional life cannot be attained without basic education. For those who can afford an education, which can often be very costly, teaching and learning materials, can be easily obtained. However, for those who cannot afford it the Internet provides a wealth of low cost resources that can only be obtained with knowledge of basic IT.

Integrity of the Qualification: Many related qualifications have lost credibility with public and private sector employers due to poor quality examination procedures or audit systems. For any IT qualification to maintain respectability and the confidence of the public and private sector, robust quality assurance systems must be upheld and implemented at all levels.

Case Studies: The Added Value of ICDL

The numerous benefits of ICDL certification to the student have been proven time and again by a number of different studies carried out in various countries in the last few years. The 2003 "*Cost of Ignorance*" study conducted in Italy and commissioned by AICA (Associazione Italiana per Informatico ed il Calcola Automatico) measured the extent of productivity savings and the reduction of hidden costs in relation to ICDL certification. The study used a

sample of 200 individuals predominantly consisting of students from Bocconi University and employees from medium to large manufacturing companies. Their findings indicated that ICDL certification resulted in an average of 10% reduction in time spent carrying out computerised tasks and a 47% increase in competence from pre-training levels. The study also discovered that ICDL certification returns a total on investment of €2,261 (approximately US\$ 2,911) per person annually.¹

Prior to the "*Cost of Ignorance*" study, a 2001 Cap Gemini Ernst & Young survey performed in Norway determined that the average office worker spends almost 3 hours per week resolving their own or other people's computer problems². The reports findings consider that the most important measure to solve the computer problems of the respondents. The ICDL covers nearly two-thirds of the areas that most people regularly have IT problems or issues with; therefore, achieving the ICDL qualification helps the employee to overcome these issues thereby increasing productivity and potentially saving the amount of lost time. In the UK, the Manchester Health Authority evaluated the results of its pilot ICDL project in 2001 and found that on average, their students gained an average of 28 minutes a day as a result of their ICDL training³. These findings were supported by the aforementioned Norway Cap Gemini study. This research also found an overall productivity gain of 8%, with 162% return on investment. Respondents were 'more confident' or 'much more confident' in using different types of software. In addition,

¹ AICA (2003) *The Cost of IT Ignorance*, pp 5-6, Associazione Italiana per Informatico ed il Calcola Automatico (AICA).

² Cap Gemini Ernst & Young (2001) *Estimation of Hidden Computer Costs in the Norwegian Population*, pp 5.

³ Stewart, H (2001) *Manchester NHS Trust with LearnECDL*, pp 10, Manchester NHS Trust.

employee morale was found to have increased from 65% pre-ICDL to 83% after certification. Pre-ICDL, 44% of respondents asked for help several times a week; after ICDL, less than 10% asked for help at all. At a societal level, the benefits of ICDL have also been proven. An independent study performed in 2003 by iTech Research into the impact of the ICDL in Ireland found that the ICDL had 'a significant impact'⁴ in raising IT skills, building the IT certification industry and developing IT training and testing sectors in Ireland. Within a 6-year period, the ICDL had created direct or indirect employment for more than 4,400 people and generated over €362 million (approximately US \$ 466 million) in the Irish economy⁵.

The Effectiveness of Automated Student Assessments

This next section focuses on the efficiencies of automated student assessments. Manual marking of test papers is one of the biggest costs and frustrations for academic institutions and other organizations that need to assess people's skills and knowledge. The arrival of the internet has brought with it the possibility to replace manual marking with computer based automated systems. Such systems are referred to as Automated Test Evaluation Systems (ATES). Not only does this save on huge administrative costs but it provides a consistency of marking that it is not possible to achieve when one is using marking schemes where a "fallible" human being has responsibility for scoring. Online ATES systems are now becoming increasingly popular and some qualifications bodies are now insisting that this option must be available. For example, the UK

Qualifications and Curriculum Authority (QCA) has demanded that by 2009, all awarding bodies must provide an online ATES option for certain categories of testing.

As the internet becomes accessible to more parts of the planet, there is an increasing need for ATES systems to support multiple languages. It is particularly important when translating tests to take account of not only the literal language but also colloquial words and phrases and cultural nuances. If certain graphics are being used then it is important that these, wherever possible, relate directly to the target country e.g. if developing an ICDL MS Office based test for Vietnam then one would need to "screen grab" from the Vietnamese version of the Microsoft application. Indeed it is better to call such translation "localization" because it is all about modifying the test to meet the needs and expectations candidates, regardless of geography. Performance must not be impaired by the localization process and it is important to constantly monitor test statistics to ensure that the expected normal distribution of outcomes exists. It is advisable that a localization partner is found in the target country, in order to ensure that the localization is as up-to-date as possible. Getting localization right first time is not easy but if due care is taken this is certainly achievable. It is not only the tests but the Test Administration that generally would need to be localized but many countries may accept an English based Administration system, while demanding a localized test for the candidate. It is also important to provide training in localized form but this is more forgiving than the testing because the latter is at the point when the qualification is being earned and therefore there must be no barriers to the candidate to perform to the best of their ability.

⁴ O'Donnell, S (2003) *The ECDL in Ireland: Impact Study* pp 6, iTech Research

⁵ O'Donnell, S (2003) *The ECDL in Ireland: Impact Study* pp 2, iTech Research

Test security is paramount because the credibility of a certification demands that the test system itself and the process surrounding it e.g. invigilation is watertight. Culturally, testing environments and processes can tend to be quite diverse from one country to another but International Standardisation requires that the differences are minimized and the results are authentic. A well designed ATES and a clearly laid out Operations Manual, probably with regular auditing, will go a long way towards establishing and maintaining the credibility of a certification.

Evidence from Preliminary Analysis

There is no doubt that a properly trained candidate using an ATES designed carefully for international deployment in a properly controlled environment will typically perform within expected bands, regardless of the geography or language. This has been found with ICDL where candidates at a Chinese University were achieving very similar results (i.e. average score and percentage of candidates passing first time) to Universities in the UK. This assumes that the candidates have been schooled well (classroom training or computer based training) and are fully prepared ahead of the test. It has been clearly found, and this is not at all surprising, that it is always better to provide a diagnostic assessment which will indicate the readiness of a candidate and indeed any particular areas of weakness. Such an assessment will also introduce the candidate to the test format and therefore avoid navigational/UI familiarization during the test itself.

Online testing also implies a minimum communications infrastructure in a country e.g. bandwidth. However, online testing does not necessarily require the candidate to actually be online during the testing itself. If connectivity is poor or unreliable then a good ATES will either support the candidate

accessing testing in an Offline mode or will provide a strong data recovery feature which will allow a candidate to continue from where they left off, in the event of a communications failure. An excellent ATES will provide both of these things.

ICDL's Contribution to eLearning in ASEAN

Over six million people worldwide have now achieved their ICDL qualification across almost 150 countries. The testing is also available in over 40 languages (including three separate Chinese languages). The Irish Government provided a grant of €19,500 to launch ECDL and an Impact Study that considered government objectives, economic benefits and social objectives showed that ECDL contributed directly to:

- Building IT certification industry
- Developing the IT Training and Testing services sector
- Developing the IT Training Products sector
- Productivity benefits
- 390 full-time jobs, 300 part-time and 3,770 people doing ECDL training and testing

The European Commission ESDIS Committee Oct 2002 recommended that ECDL "*be accepted as a Europe-wide basic IT accreditation scheme*" and in April 2003, the UNDP (United Nations Development Program) enrolled 5,000 staff members in 131 countries in the ICDL program. Furthermore, some major corporations such as BP have recently deployed online testing globally for ICDL certification. Put quite simply the ICDL qualification will provide the foundation of basic IT skills on which all other advanced systems can build upon. It provides the fourth essential skill namely, basic computer literacy (in addition to literacy and numeracy skills) to identified

target audiences in ASEAN countries. To develop a knowledge-based society in our ever more complex world, citizens need to be computer-literate. Education is the driving force in developing a nation's human capital. By incorporating ICDL with ASEAN countries, it is hoped that this will move the education agenda forward to further maximise the competitive advantage of individuals living and working in the region. These include the full scope of a nation's citizens whether they are employed, unemployed, educated, uneducated, in public or private sector.

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