Lifelong learning has become an imperative for people living in the 21st century. This CDTL Brief on Lifelong Learning discusses various issues on the subject and why it is a necessity for self-preservation and survival.

Lifelong Learning and the Virtual University

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Learning did not begin at school and it should not end there. Living in the twenty-first century requires us to constantly update our knowledge and develop new skills to keep up with a rapidly changing environment. Universities are beginning to recognise that lifelong learning is not merely a buzz word. It is, in fact, a global imperative. With knowledge now reportedly doubling in less than two years, the necessity of knowledge-upgrading has become a truth universally acknowledged.

“The University Won’t Survive”

In an interview with Forbes, Peter F. Drucker said:

Thirty years from now, the big university campuses will be relics. Universities won’t survive. …Already we are beginning to deliver more lectures and classes off-campus via satellite or two-way video at a fraction of the cost. The college won’t survive as a residential institution. (Kenzer & Johnson, 1997)

Drucker’s pronouncement has yet to be realised and may never be. The traditional university will most likely continue to exist, partly because it is able to adapt and change, and partly because the on-campus learning experience—the opportunities for face-to-face intellectual and social interactions, the stimulation of a research-intensive environment, the strong sense of scholarly tradition and community—cannot really be replaced. However, there is no denying that over the last couple of decades, technological learning solutions have evolved to a level of sophistication that has made possible the creation of virtual universities. The technology today enables effective electronic delivery and interactive communication, providing both synchronous and asynchronous learning options, multimedia-rich content, user-friendly applications and presentation tools, as well as a wealth of e-resources offering much enhanced options for teaching and learning. In addition, the growth in Internet access, speed and robustness has been phenomenal. In spite of complaints against ‘traffic jams’ on the information superhighway, sliding costs as well as increasing accessibility and IT literacy have enabled technology to make an immense impact on education.

Studies suggest that appropriate use of IT can deliver quality learning experience, offer more flexibility, and enhance contact with teacher and peers even in large classes, thus allowing more time spent on learning with more than credible outcomes (students’ performance measured by grades is comparable or sometimes even better, and the learning is deeper than traditional teaching methods). Perhaps what is most significant is that learners report acquiring the ability to learn independently and beyond formal classroom structure. It may be worth noting that in 1999, Britain’s Higher Education Funding Council ranked the Open University 11 out of 98 schools in terms of quality of teaching and awarded its technology department full marks for the quality of its general engineering courses (Grose, 1999).
e-Learning: The Lessons Learnt

Not surprisingly then, most institutions today have adopted technology-mediated learning to varying extents, though there is now less of the ‘hype’ and vast claims of the dot.com era. Lessons have been learnt, among which are the following:

- technology has introduced many new tools; not all are equal
- purely virtual classrooms and click-and-drag curricula have not delivered their promise
- a hybrid model—face-to-face and online—works better than an exclusively e-based pedagogy, and is arguably “the most significant unacknowledged trends in higher education”¹
- e-learning should be used to do what traditional teaching cannot achieve or cannot do as well (e.g. asynchronous learning, simulations, ‘drilling’) rather than replace traditional teaching methods
- ‘chunking’ produces a more useable product (i.e. small, stand-alone units rather than whole course/programmes)
- developing e-learning materials is costly and manpower-intensive and ‘specialisation’ and economies of scale are necessary for sustainability
- e-learning creates different values for different learners and purposes

These points suggest that while technology-mediated learning is useful in traditional higher education, perhaps its greater value and ‘return on investment’ is in lifelong learning, particularly where more formal, continuing professional education is concerned, rather than that pursued for general interest or enrichment. Non-formal education generally involves learners who are working adults, have limited time but are fairly highly motivated and self-driven. An asynchronous learning network with its ‘any time/place/pace’ learning would therefore better accommodate their schedule. Also, while this group needs to refresh their skills and knowledge continuously, the upgrades are usually done in instalments. ‘Chunking’ caters to this by providing manageable, just-in-time learning with high degree of relevance and perceived usefulness—all of which are factors motivating adult learners. Further motivation and stimulation will be provided with a ‘hybrid’ system that offers them some of the structure and stimulus of face-to-face (virtual or real) learning. Satellite and video-conference technology now offer virtually synchronous learning and group interaction. Together with these, the incentive of proper certification will remediate the problem of relatively low success rate of distance/self-learning resulting from heavy dependence on self-discipline and will power. This translates into clear advantages not just for individuals but also for their employers; e-learning and e-training will optimise effort and reduce cost and work disruption.

The Virtual University for Lifelong Learning

Again, not surprisingly, as the ‘market’ for continuing education grows and technology continues to improve, virtual universities have materialised. Generally, new players have not fared well largely because start-up costs are high—NYUOnline spent US$25 million developing seven courses—and the return on investment (ROI) dictates a very focused range of offering and scalability which requires a sizeable demand new players are unable to attract without the benefits of the traditional campus and, perhaps more critically, the ‘branding’ (e.g. MIT allows open access to its course materials but maintains that that is not what differentiates an MIT education). Established institutions, however, have found it a logical and positive extension of their main business. Harvard, for instance, has made the shift:

The long-standing rule requiring Harvard degree recipients to spend at least one year on campus has been revised...many in the business of higher education are asking whether giving the green light to a degree-granting distance learning program at the oldest institution of higher learning in the U.S. marks a sea change in the field of online education. (DiSalvio, 2003)

Several departments at Stanford (e.g. Biomedical Informatics, Computer Science, Electrical Engineering, Mechanical Engineering, Management Science and Engineering) now offer Master’s degrees, some entirely online and some ‘hybrid’, while its Center for Professional Development offers a range of short courses in various distance learning formats. Oxford offers a Master’s in International Human Rights Law, University of British Columbia has a number of certificated programmes, as do many other ‘mainstream’ institutions.

Catering to lifelong learning via e-learning is becoming a global phenomenon. Perhaps the best

Lifelong Learning is not a New Concept

Anyone who stops learning is old, whether at 20 or 80. Anyone who keeps learning stays young. The greatest thing in life is to keep your mind young.

Henry Ford

The notion that learning should be lifelong is not new. According to Henry Ford, continuous learning, and not the real age of a person, is necessary to “keep [the] mind young”. However, the need for lifelong learning has gained much greater prominence in more recent years. This article will highlight some insights and issues on lifelong learning.

References


hand presented to the baby) and some simple attributes common to infants (e.g. crying for attention).

**Learning is a Natural Instinct**

As the baby progresses through life, most of his learning occurs naturally. Indeed, nature has endowed mankind with the capacity to learn quickly as a primordial instinct for survival. In the early phase of human life, learning is fun, spontaneous, imaginative and often creative. There is freedom and joy to learn from every opportunity presented to a child, especially through play with other children, family members and toys.

**Learning by Design**

Most human learning does not occur by design. The classroom is unique because it is a designed educational experience. (Davis, Alexander & Yelon, 1974)

As a child begins pre-school and moves on to college, his freedom to learn becomes increasingly curtailed because of the need to learn in a formal classroom setting with prescribed course goals. In the later stages, there is just too little time and hence a lack of motivation to learn anything else other than what is required to pass the various examinations of a formal education system. However, the award of prized college diplomas or degrees so important for the various phases in life are, indeed, rewards for one’s conformity to the education system.

**Learning Beyond the College Doors**

The hardest conviction to get into the mind of a beginner is that the education upon which he is engaged is not a college course, not a medical course, but a life course, for which the work of a few years under teachers is but a preparation.

*Sir William Osler*

For many individuals, the college diploma or degree often marks the end of almost 20 years of formal education leading to two options: firstly, with freedom from set course goals and fear of failing examinations, there are various opportunities to learn again. Secondly, the college qualification may lead students to an erroneous belief that there is now a lesser need to be actively engaged in learning.

Today, we live in the digital era of information explosion with rapid advances in sciences and technology that impact our working environment and our daily lives. A college education is no longer enough to equip a person for a career for life as scientific knowledge grows exponentially (Bandaranayake, 2001). This trend is clearly recognised in some professions (e.g. medical, legal, engineering) which compel their practitioners to undertake continuing education and professional development programmes throughout their careers (i.e. continuous learning, upgrading and updating of their knowledge, skills and key attributes to ensure their continued professional competency).

**Learning for a Lifetime of Employment, Empowerment and Enjoyment**

There are three main reasons (‘the three Es’) identified by Knassel, Meed and Rossetti (2000) on why lifelong learning is so important, namely:

1. **Employment (‘Economy’):** Continuous quality learning will greatly enhance one’s employability in today’s global economy. Organisations now put a premium on *self-directed learners* who align their interests with the all-important mission of creating learning organisations in businesses, industry or governments to ensure their own competitiveness and survival. As the President of National University of Singapore, Professor Shih Choon Fong aptly said:

   In the old economy, university education generally prepared a student for a career for life. In the new economy, we must prepare a student for a life of careers. This means a graduate must possess more than the skills for a certain profession. But more importantly, a graduate must have the habits and enthusiasm for lifelong learning, which include discovering, creating and applying new knowledge all through his life.1

2. **Empowerment:** Engaging actively in lifelong learning also enables a person to develop his skills and abilities to the fullest and consequently, contribute more to his organisation, hence deriving greater personal satisfaction and control over one’s career development within an organisation. In Singapore, several senior civil servants as well as government and business leaders from humble family backgrounds are model examples of empowerment through continuous learning. Another example of learning for empowerment is making education accessible to the illiterate or disadvantaged communities to help them become more independent and self-reliant.

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When we were undergraduates, cells seemed much less complicated than they are now. In reality the subject was not any simpler 10–15 years ago, but the burst of knowledge in recent years has made the current image of cells more sophisticated. The knowledge gap on cells is even more apparent when we look at first images of cells obtained in 16th and 17th centuries. It is conceivable that the complexity of that image will increase steadily in years to come, and undergraduate students two generations from now may be looking at a more detailed picture (see Figure 1).

Conclusion

To create an appetite for learning in individuals that will sustain them for life. When we see, hear, smell, touch or taste something, the experience is processed and embedded in our minds and it becomes something from which we can construct our own meaning and understanding. As we progress through life, we need to heighten our experiences to develop our potential to the fullest. We must commit ourselves to a lifetime of learning that will ensure not only our own economic well being and that of our organisations and our society, but also that of our minds will be continuously ‘nourished’ and stay young. Our national aspiration to promote “thinking schools and learning nation” is indeed Singapore’s commitment to lifelong learning.

References


can then help students synthesise a basic chemical and biological picture of cells that will enable them to explore further and expand their knowledge on their own. Subsequent learning will be left to the students themselves. In other words, as teachers of cell biology, we must not only be able to impart to students core knowledge that can facilitate continuous learning of the subject, but we must also find ways to encourage students to further their knowledge on cell biology through lifelong learning.

Lifelong learning is possible when students develop a lifelong interest in the subject. An indication that students have developed lifelong interest is when they start engaging in related undergraduate research projects or embark on graduate work after they have been through their first courses in cell biology (typically in their second year). These students, driven by their interest in the subject, will constantly update their knowledge on the subject and appreciate the value of new information which may occasionally aid their occupational duties either directly or indirectly. With a positive attitude towards lifelong learning, students will be capable of assessing critically, the massive amount of information they face in this information age long after they have left the educational institutions.

Perhaps one key factor in ensuring that students adopt a positive attitude towards lifelong learning is to impress upon them that knowledge is never static. Knowledge could evolve due to either technological breakthroughs that offer means to re-investigate and explore certain ideas in greater depths and details, or the emergence of new ways of thinking that challenge existing ideas thus resulting in different perspectives. A survey of the history of cell knowledge will reveal that initial ideas about cells have been subsequently revised and updated. The present state of cell knowledge is dynamic. On-going work and research by scientists will certainly result in new data which will modify or refute older ideas and refine our understanding of biological processes in cells. In turn, new ideas may pose yet additional questions, prompting further studies that would yield even deeper insights.

More importantly, students should be made aware that a positive attitude towards lifelong learning can help them ‘survive’ the information age and ‘avoid’ the unfortunate fate of being left behind or becoming obsolete. This is particularly crucial for students who just want to pass examinations and get a degree. They must be made to realise that learning does not stop when they receive their scrolls.

A positive attitude towards lifelong learning can also be driven by a simple curiosity about the things (not necessarily related to our specialisation) around us. Therefore, we should inculcate in students, the habit of reading widely to expose themselves to different fields. This is useful as ideas from other fields can help us look at problems from different angles. Progress in the way we understand how cells function came about through the advent of other fields. As such, while students may not be experts in a field distinct from their professional training, they are nonetheless aware that perhaps an alternative approach to solving a problem exists elsewhere. More importantly, we should build up students’ confidence in applying principles they have learned in attempts to understand difficult facts or scenario. We should also teach them not to be fearful of details, for they are paths to the most important aspect of knowledge—application.

Finally, in these modern times, it is imperative that cell biology teachers be given a free hand in our teaching approaches and be allowed to set our own standards. This is crucial given the rate at which the field is advancing. Rapid advances can only be effectively followed and taught by teachers who are lifelong learners themselves. Any attempt to normalise teaching standards, module difficulty, or factual content in order to be more comparable to classical disciplines in biology would be undesirably counterproductive. It may stifle both teachers’ and students’ interest, resulting in little motivation for lifelong learning. The teaching of cell biology requires a multidimensional approach, be it the teaching of concepts (Khodor, Halme & Walker,
The 21st Century Population Trends

Like most North Americans, Japanese and North Europeans retirees, the post-war baby boomers in Singapore retiring from the workforce in 20–30 years are of relatively good health and mentally active. Though a greying population in a first-world economically advanced country is a boon in that financial resources are available for lifelong learning for intellectual, utilitarian or spiritual needs, it is a bane for those seeking new employment as most jobs have become knowledge and information intensive.

Why Lifelong Learning?

Characterised by rapid globalisation and the rise of the knowledge-intensive economy, the 21st century is an era where unprecedented changes in the political, social and economical arenas are happening at a breakneck speed. These, coupled with technological advancement in biotech and materials science, make the 21st century an extremely challenging time to live in.

Amidst the overwhelming concerns and issues, lifelong learning, though not a modern phenomenon, holds the key to survival in the 21st century. Generally, the economic rationale for lifelong learning comes from two principal sources. First, the rise of the knowledge-intensive economy means that the level of skills demanded by employers is constantly being raised. Thus, employees need to constantly acquire new skills and update their knowledge. Failure to do so could render one obsolete or ‘handicapped’ in the workforce.

Second, technological developments demand continuous renewal and updating of skills as job descriptions evolve and diversify rapidly under shifting market conditions. The ‘iron rice bowl’ of yore (i.e. a job for life) is gone for good. In today’s corporate world, cost-cutting measures such as retrenchments are common even in industries once thought sheltered and stable. For some people, this may mean two to four career changes in their 40–50 years of working life. Thus, employees of the 21st century must be prepared to move from one employer to the next throughout their working lives/careers by keeping themselves abreast of the skills and requirements of their field or industry.

Education Beyond the University

Given all these characteristics of the 21st century landscape, education beyond the university and lifelong learning are essential to ensure individual
success as well as the nation’s future prosperity. In a knowledge-intensive economy, school is never out and one never stops learning. Without a lifetime of education, training and retraining, Singaporeans will not be able to understand our world in the 21st century, much less catch up with the demands of the new economy. Table 1 shows how the learning needs of an adult change as he/she goes through different stages of life.

Table 1. 21st century careers and roles in a lifetime

<table>
<thead>
<tr>
<th>Stages</th>
<th>Ages</th>
<th>Characteristics</th>
<th>Learning Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21–45</td>
<td>Career/Job/Parenthood</td>
<td>Intellectual and utilitarian objectives</td>
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<tr>
<td></td>
<td>(25 years)</td>
<td></td>
<td>dominate</td>
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<tr>
<td>2</td>
<td>46–60</td>
<td>Mid-life/Transformational Stage</td>
<td>Utilitarian, recreational and spiritual needs dominate</td>
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<tr>
<td></td>
<td>(15 years)</td>
<td></td>
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<tr>
<td>3</td>
<td>61–85</td>
<td>The Third Age</td>
<td>Recreational and spiritual needs</td>
</tr>
<tr>
<td></td>
<td>(25 years)</td>
<td></td>
<td>dominate</td>
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The NUS Extension has been playing a unique role in lifelong learning since its inception in 1966. Modelled after its counterparts in top US universities (e.g. Harvard Extension, UCLA Extension, MIT Professional Institute), NUS Extension provides a channel for continuous learning to help individuals succeed in the 21st century environment where lifelong learning is imperative.

NUS Extension provides a wide range of quality programmes and courses in science and technology, business management, language, culture and history. These are professional certificate and diploma programmes, short courses and online courses. In addition to teaching resources from the NUS community, the Extension sources for professional courses from its partner university extensions in the U.S. and renowned training institutions (e.g. American Management Association). NUS Extension also offers some of the best language and culture programmes in Mandarin, English and Bahasa Indonesia for executives entering the huge markets of China, India and Indonesia. Not only do course participants acquire professional knowledge and management expertise, they will also be equipped with the ‘cultural DNA’ to excel in these markets.

To help prepare and equip Singapore’s work force, the Extension is currently focusing on professional education/management development courses for adults in stages 1 and 2 of their lives. In addition, the Extension offers high quality lifelong learning courses for mature adults across all three life stages. By year 2007/8, the Extension’s projected annual enrolment of 10,000 for both categories of courses and programmes.

As a lifelong learning institution, the challenge for NUS Extension is to continue to structure our education and lifelong learning programmes to meet the needs of our economy, and also offer mature adults opportunities to learn and re-learn to live fulfilling and purposeful lives.