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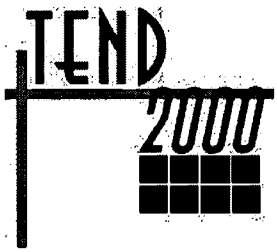
ABSTRACT

As in other countries, older adults in Australia could benefit from acquiring information technology (IT) skills in many ways, including improved access to information on health issues and development of the skills needed for employment in high-demand IT-related occupations. The research on adult learning and the problems faced by many older adults when using IT suggests several strategies for meeting the learning needs of older adults seeking to learn about and use IT. Knowles' work on how adults learn can provide insight on how older adults learn. Designers of workstations to be used by older learners using IT should be aware of age-related differences in older adults' cognitive function. Having younger students assist older people with IT can be a rewarding experience for both groups. Older adults tend to have had little exposure to the constructivist learning experiences that promote development of the problem-solving and independent learning skills needed to engage in lifelong learning. The introduction of digital television into the home is an opportunity for Australia to address this problem at the national level. This technology will make it possible to customize materials so that they can be presented to older adults in meaningful and practical ways. (Contains 12 references.) (MN)



Crossroads of the New Millennium

Meeting Older Adults Learning Needs When Using Information Technologies

Prepared and Presented

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Abstract

Globalisation of education made possible through developments of information technologies can have a significant effect by providing learning opportunities for individuals throughout their life span. The increasing need to make career changes during our working life demands appropriate and timely training and education. Simultaneously, there is awareness in many societies that the current trend of workers taking early retirement is a luxury, which cannot be sustained. Not only are skilled and experienced people lost to the labour force prematurely, but society in many instances has to support this large population into their old age. Although older adults generally have more time to devote to utilising this technology, they are the last to adopt its usage. This paper explores the problems which older adults experience with information technologies and suggests strategies which can be employed to address these issues. It reflects on the author's experience as both a designer of learning scenarios and as a researcher investigating learners' needs when using information technologies. Results of the author's current and past research will be illustrated as examples during the presentation.

Meeting Older Adults Learning Needs When Using Information Technologies

INTRODUCTION

Not so long ago, futurists were warning us that we could expect to change careers around three times during our working lives. This figure underestimated the frequency of job training/retraining. Directly related to this changing need, are the rapid advances being made in information technologies and their influence on work. Traditional jobs, such as those in production industries and in particular those involving manual labour, are rapidly disappearing and new positions are being created in services and information technology industries.

Concurrent with this major work revolution, is the development in many countries of a growing older population. Last year globally, there were 578 million people over 60 years of age. The phenomena of an ageing population coupled with changing patterns of work is viewed by some with dismay. The view is frequently expressed that older workers are less adaptable to change, particularly where information technologies are involved in the workplace. However, little research has been done exploring this relationship between these two events and investigating the opportunities which this situation may create. As educationalists, we have a responsibility to prepare individuals within society to minimise potential disadvantages that this trend may create and, at the same time, we should also seek to maximise potential opportunities for individuals and society as a whole.

Young people entering the workforce for the first time today can generally be considered to be more aware, confident, and competent in handling changes (such as those brought about by information technologies) than older, established workers. It would appear obvious that there is a need to build on our knowledge of how older workers can be assisted to cope with societal changes, including those impacting on the workplace. Armed with this knowledge, we can plan and develop learning materials for appropriate delivery to maximise older adults' capabilities in coping with information technology related and other changes.

AGEING POPULATION

Patterns of population groupings vary from country to country, but there is a general trend in developing countries of the numbers of older citizens increasing at a faster rate than those of younger age groups. In this paper, the author has used mainly Australian figures to demonstrate population patterns, but similar trends are widely reported internationally. In Australia in 1976, 1.3 million people were over 65 years of age which represented nine per cent of the population whereas last year there were 2.3 million people over 65 years of age or 12% of the population (Bishop, 1999). Estimates for Australia predict, that by the year 2016; there will be 3.6 million or 16% of the population and by the year 2041, there will be 5.7 million. This latter figure represents one quarter of the estimated Australian population.

IMPLICATIONS OF AGEING POPULATION

Factors which have led to this increasing weighting towards an older population can be largely identified with improved health-care processes and facilities. Individuals are becoming more aware of healthy lifestyle practices, such as in personal hygiene and diet. In the future we can expect individuals to take more responsibility for their personal and family members health and well being. This can be assisted by training older people how to learn using information technology resources, such as the Internet, to access information on health issues. This situation will be largely driven by the expected changes to traditional health-care systems which will be less likely to give individuals the current degree of medical practitioner care as the cost of this service escalates and new applications of information technologies become available. Personal monitoring of health condition through sensors located in the home and 'wearable computers' will increasingly empower patients to take care of their own health. Education and training on managing personal health-care will require new approaches by educationalists and health professionals to prepare individuals for this role.

In the past, statutory retirement ages have been legislated for in many societies. In Australia until recently, male workers were compelled to retire from full-time employment on reaching 65 years of age and female workers were compelled to retire at 60 years of age. This is no longer the case and individuals can continue to work indefinitely into their old age. Implications of this, one would think, would be that traditional barriers to older workers

gaining and keeping jobs will be breaking down. However, this does not appear to be the case, at least in Australia.

Societies do not appear to be maximising on this labour pool of older workers who wish to continue or return to the labour force. Men between 55 and 59 years of age in particular are rapidly disappearing from the Australian workforce (Bishop, 1999). If you consider that many people are now entering the full-time workforce up to 10 years later than previously as they continue with full-time study, then the pool of potential employees is diminishing. This may be acceptable in times of low labour demand, but with many societies showing reduced unemployment trends then problems can arise in filling evolving employment opportunities.

The older population of unemployed, either through retrenchment or retirement, is a logical pool where employers can draw on workers. This is currently happening in the United States where programmes have been set-up to attract, train, and maintain older employees in evolving industries (Microsoft, 1998). Society cannot afford to waste the wealth of knowledge and expertise in our older workers who may be driven, or opt, for early retirement. Increasingly this will include workers with information technology skills in high demand. Peter Drucker, the management guru, predicted that organisations which succeed in attracting and holding knowledge workers past retirement age, and make them fully productive, will have a competitive advantage (Drucker, 1999).

Implications of this swing towards older populations are many and obviously include the need for appropriate and adequate health and welfare provisions. Technology-led change also demands that our education system identifies and addresses the changes required to meet the needs of an older population. This requires that we become more aware of older peoples' potential to learn and to choose appropriate methodologies to maximise learning.

HOW OLDER PEOPLE LEARN

As detailed in the discussion below, learning is a lifelong experience. Although physical and mental capabilities diminish with age, involvement in stimulating mental (and physical) activities can maintain learning capabilities into 'ripe' old age with no age limitation. Hearing and sight are two obvious areas where decline takes place throughout adult life and speed of

performance may drop, but often these can be compensated for with technology (see *Information Technology* below). Performance in some specific tasks may decrease as people age due to changes in motivation, interest, values, goals and self-image. Societies behavioural norms for age-related behaviour have in the past dictated older workers' directions. For instance, the rules on compulsory retirement at a set age. Many organisations today perceive a problem with their image when employing older people and this impacts on the greater ratio of people unemployed among older age groups.

Several theorists have attempted to identify differences in learning characteristics related to age. Knowles (1984) drew up a list of assumptions which he believed differentiated between adult and childhood learning. These were:

- the learner feels a need to learn
- the learning environment is characterised by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression and acceptance of differences
- the learner perceives the goals of the learning experience to be their own goals
- the learner accepts a share of the responsibility for planning and operating a learning experience
- the learner participates actively in the learning process
- the learning process is related to, and makes use of, the experience of the learner
- the learners have a sense of progress towards their goals

Knowles believed that learning achievement of older people could be improved by employing student/instructor learning contract. Critics of Knowles have pointed out that what he claimed was a theory was really only a set of principles and that his 'unique' characteristics of adult learning could also be applied to children. Nevertheless, Knowles work can provide some interesting starting points of comparisons between older and younger learners.

Cognitive style is a dimension of human functioning where differences have been detected between age groups. One of the most widely used instruments measuring cognitive style is Witkins (1971) *Group Embedded Figure Test*. Employing this instrument, researchers and psychologists can detect differences in individuals' degree of field-dependency/field-independency. People who are influenced by the surrounding field in a learning scenario are

called field-dependent and those who are uninfluenced are referred to as field-independent. Researchers have shown that field-dependancy is relatively stable during young adulthood, but as people age they become more field-dependent and therefore learning scenarios targeting older learners should allow for this. Field-dependent people react to situations as a whole without analysing it, responding on the basis of what it does rather than what they do with it. On the other hand, field-independent people keep the individual parts of a situation separate from one another, ignoring these parts which are irrelevant to the task (Coventry, 1989). In the case of older learners using information technology, then workstation designers should be aware of cognitive function age related differences.

Another dimension of individual cognition is learning style which can be referred to as a sub-set of cognitive style and is defined as the way people absorb and retain information. A measure of learning style is Honey and Mumford's (1992) *Learning Style Inventory*. By combining the characteristics of learning and problem-solving processes, Honey and Mumford suggest that individuals learn in four modes:

- active experimentation
- reflective observation
- adaptive observation
- pragmatic involvement.

The choice of learning mode is governed by each individual's goals and his or her specific objectives according to Honey and Mumford. As was indicated above, affective dimensions which relate to motivation, self-image, and goal setting tend to change with age for various reasons. Significant influence may be expected by individuals as they adopt what they consider society's norms for their age group.

INFORMATION TECHNOLOGY

Occupations involving information technology skills are increasing at the same time as many traditional occupations are diminishing. Electronic delivery of learning materials by CD-ROM, Intranets and the Web can provide a means for workers to re-train to meet the labour needs of evolving industries. The value of this means of delivery has been well documented in recent years and includes open access and self-paced learning. However, accessing

information technologies is foreign to many workers as are the skills required to work independently with self-paced learning materials. In general, these disadvantages increase with age and are reflected in recent figures released in United Kingdom, United States and Australia. In Australia, for instance, a recent study investigating use of the Internet and its relationship to age, just over 74% of 18-24 year olds accessed the Internet in the 12 months up to May, 1999. The corresponding percentage of older people who accessed the Internet over this period was 53% (25-39 year olds); 39% (40-54 year olds); and 10% (55 years and over) (Australian Bureau of Statistics, 1999). Of particular interest, however, is the rate of increased numbers from the 55 year and over who accessed the Internet from the previous year. The percentage of Internet users doubled, which was a significantly greater rate than for any other age group. Increasingly, studies are showing that more and more older people want to become familiar with this technology, but for a variety of reasons many do not achieve this.

POTENTIAL BARRIERS TO USING IT

Numerous studies have explored why some people have had problems utilising information technology. Reasons have included differences in learning styles, cognitive style, motivation, and technophobia (Cameron and Treagust, 1997). Technophopia, which includes anxiety, negative thoughts, and attitudes towards technology can be particularly disadvantageous in the Information Age (Rosen and Weil, 1992). Younger people, who have grown up with this technology, are less likely to be technophobe than older people, and are more ready to adapt to rapid societal changes.

Classroom research has demonstrated that many (if not most) students are more confident using information technology and have a greater degree of computer literacy than their classroom teachers (Bias and Carey, 1996). Many studies have reported on the teacher learning information technology skills from their students. Older people may have less opportunity to have readily available helpers at times when they are using these technologies. Many younger adults are working and running homes and have little time to build their skills under the supervision of a mentor. Older adults may be homebound and have little opportunity of exposure to information technologies.

If we look again at the Internet access figures related to age groups we can identify associated conditions which are fairly typical for each group. Adolescents/young adults of 18-24 years of age have generally been exposed to this technology during their compulsory schooling. Many are continuing, both part-time or full-time, with education and training and can be expected to be keeping pace with many information technology developments, such as Internet access courseware and computer searching. More mature adults in the 25-39 year age group are quite likely to be setting up a home and starting a family. Similar to many school teachers, they may be learning this technology through their children's interest in playing and learning. When we reach the more middle-aged years (40-54 years of age) this latter influence often diminishes as children leave home. Children are increasingly being viewed as a source for assisting older users become information technology confidant and literate. Setting students the task, either individually or in groups, of assisting older people with information technologies can often be a rewarding experience for both parties.

LIFELONG LEARNING

Traditional classroom teaching to relatively large groups has been the main platform for societies' education and training programmes for over 100 years. Society has dictated set curricula, teachers impart information to students who 'throw it back' at exam time. The introduction of information technologies is forcing a long overdue appraisal of teaching and learning methodologies. New learning environments are occurring where individuals (or groups) can learn relatively independently. The challenge to educators, many of whom are loathe to depart from traditional methods, is to prepare learning scenarios that encourage the development of independent learning skills in our students. The wheels are gradually starting to turn as more and more educators practice constructivist principles, where the focus is on the learning experience, students are actively involved in forming their own interpretation, and have the opportunity to practice the development of problem-solving skills (von Glaserfeld, 1991). Students utilising this new learning environment are developing lifelong learning skills which can be transferred from learning scenario to scenario. Older adults tend to have had little exposure to constructivist learning experiences, almost certainly not from their formal education years, yet independent learning skills offer the greatest hope to allow older adults to 'catch-up' in today's workplace through open-learning (Hannafin, 1996) or self-paced learning (Hammond and Collins, 1987).

An opportunity to address this at national level should be taken with the introduction of digital television into the home. Interactive learning programmes should be designed to help older adults to develop lifelong learning skills utilising open learning and self-directed learning strategies. By employing the customising potential of this technology, material can be presented in a meaningful and practical way for the individual. This policy direction would significantly benefit individual older adults to cope with change and manage their work, social, financial and health needs in the future. To achieve this end, it is imperative that research is conducted to understand the special learning needs of older adults. The remainder of this presentation will be devoted to the author's experiences of researching older adults needs with perception and use of technologies. This includes the design of an instrument to measure older peoples' resistance to the use of information technology, measuring awareness and degrees of technophobia in the community and using a simulator to measure driving skills level.

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