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## DIGITAL TRANSMISSION: AN INNOVATIVE STRATEGY TO IMPROVE QUALITY IN EDUCATION

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### ABSTRACT

*In 2000 the Australian government, recognising the need for educational equality for Australian Indigenous people has commissioned a taskforce to identify various factors affecting Indigenous Education. One of the factors identified by the task force included the need for strategies to deliver quality education to various Indigenous communities. Research studies conducted on the delivery of education highlight the importance of the Internet for the flexible delivery of education. However, government reports indicate that Australian Indigenous communities have problems in utilising this technology for reasons such as access, infrastructure, training, etc. Therefore a new model based on the recently introduced digital technology may be tested for delivering quality education to Indigenous communities.*

*This paper provides a discussion of the impact and influence of digital transmission in facilitating the delivery of quality educational resources for Indigenous Australians. For the purposes of discussion, a model architecture is formed and a number of issues based on this architecture are considered. These issues include data transmission, delivery mechanisms, regulations and the pricing of realising such services. The focus of the paper is to provide discussion of quality educational services to a wide range of Indigenous audiences.*

### INTRODUCTION

The National Aboriginal and Torres Strait Islander Education Policy states that the Aboriginal and Torres Strait Islander people remain the most educationally disadvantaged group in Australia (DEET,

1989, p. 3). Hunter (1996) cites that, for Indigenous people, completing Year 10 or 11 increases employment chances by 40% and a post-secondary qualification increases employment chances further by 13-23%. In a later publication Hunter (1997) also states that education is the largest single factor associated with the current poor outcomes for Indigenous employment. Indeed, the influence of education dwarfs the influence of most demography, geography and social variables.

Collectively these studies establish that Australian Indigenous people are experiencing drawbacks in education due to lack of availability of educational resources. So there is urgent need to pay attention to Indigenous education, primary and secondary education to start with. According to Hunter and Schwab (1998) remoteness is a factor for Indigenous students to be away from school. So it appears that there is a need to concentrate on the availability of various resources needed to facilitate education to Indigenous communities because of the remoteness of these communities. This problem can be alleviated by the technology such as Internet in conjunction with Digital transmission, it is possible to broadcast education aspects on Internet.

Despite the fact that Internet is widely used for the delivery of educational resources, there are specific problems associated with this delivery mode for Australian Indigenous communities. This provides impetus to explore an alternate delivery such as the digital transmission for delivery of educational resources. This paper provides a basis for discussion on how digital transmission can be used to deliver quality educational resources to Indigenous communities in Australia.

## **INTERNET TO FACILITATE FLEXIBLE DELIVERY EDUCATION**

The current trend around the world is to use the Internet as a vehicle to provide distance education through online education without compromising quality. Goodyear et al. (2001) supports this by stating 'Online Continuing Education is creating a new and distinct realm, and it is the future of education. In recent times academics have been adopting new and innovative ways to delivering units, which have been designed to accommodate multimedia and instructional design to reach the distant students. But the skills and methodology used in online course are not the same as in the case of the traditional classroom. Moreover, the courses taught over the Internet need to meet the same rigorous conditions for accreditation as courses taught on campus. Nonetheless, the Internet is believed to provide greater flexibility for both students and the faculty (Barr & Tagg, 1995).

The Internet provides new ways of learning in terms of time, location, content, and form. Students are also able to learn what they want, where they want and when they want in a format appropriate to them. The Internet is considered to be a solution for that group of students for whom the conventional educational model poses difficulties such as studying at home, living in isolated areas, physical limitations and work commitments. The traditional or conventional distance education has meant delivering course by way of mailed text, video, radio and TV. Instructional techniques, which emphasized student activities and interaction with other students such as collaborative learning, were not feasible with traditional distance education. The Internet is seen to supplement the conventional distance education. With the advent of the Internet, e-mail, bulletin boards, list servers, telnet, chat sessions, online interaction, IRC etc the grounds for collaborative learning, bringing together the teacher, student relationship with great interaction has been laid. Students are able to submit their

activity such as assignments and other projects through the tools provided by the Internet and this realizes savings in time and distance (Bassi, 1994).

In addition to the above, the Internet is also serving the purpose of a repository by holding numerous electronic files for information dissemination purposes. These are often referred to as E- texts. These E- texts facilitate searches to arrive at required information content. In addition, students who use the Internet tools are able to transfer these electronic files from one location to another (Arena, 2000).

## **PROBLEMS WITH INTERNET FOR INDEGENOUS COMMUNITIES**

Although Internet has greater potential for its use in education, Internet also has its disadvantages. The ease with which materials are accessed by students is dependent upon their computing knowledge. Internet access usually involves a fee or charge. The type of material accessed by students is not known beforehand – it is not possible to read through the entire electronic text and hence students may not be able to comprehend the substance of materials they are accessing. It is often difficult to control the type of materials accessed by students – for example, students may access unwarranted or unauthorized materials. For Indigenous students, the availability of resources to access the Internet and the use of such resources, associated with technical knowledge has been a source of concern working against the claim that the Internet is beneficial education (Craig & Beck, 1993).

Aboriginal children who experience the breakup in families, the loss of Indigenous culture, the demise of many Indigenous languages, racism, violence, poverty, lack of facilities, and poor health have very little incentive to finish their schooling and possibly look forward to higher education. In the case of remote or rural children with a lack of facilities even fewer opportunities exist. These students' lack basic schooling, leads to literacy and numeracy skills. In

addition, these children do not have sufficient computing skills to utilize Internet education. Therefore, the recent introduction to information technology based education such as the Internet education will not necessarily have any influence on Indigenous communities. Further, it appears that the Internet education has not been fully explored for these communities. This is supported by the MCEETYA report, which claims that it is difficult to achieve educational equality for Indigenous people using the information technology resources (Gustafson & Branch, 1997).

Under these circumstances, alternative methods have to be searched or investigated to replace Internet education in order to provide flexible methods of delivering education to these students. There needs to be a method that still could bring about benefits to rural communities which is not fully dependent on computers and associated computer learning skills. One such technology is the digital transmission (Evans, 2000).

### **DIGITAL TRANSMISSION**

Digital transmission is defined in the *Television Broadcasting Services (Digital Conversion) Act 1998* ("the Digital Conversion Act") as a service that delivers information in the form of data, text, speech, images or in any other form to persons having equipment appropriate for receiving that information, where the delivery of the service uses the broadcasting services bands.

This new technology allows people to access Internet over a TV and vice versa. This means that traditional Internet can be simulated on a TV and traditional TV program can be relayed on Internet. This new technology allows educational service providers to facilitate a number of interactive services using the available broadcasting spectrum for TV. The services can be library services, online teaching and learning materials, interaction with other students using a chat facility, bulletin boards, email and other online

services currently provided by the Internet (Evans, 2000). In contrast to the current broadcast, digital transmission allows a student to access materials at any time using their TV sets. The digital services facilitate interaction because the information is stored in 'digital' form. In addition to this, it is possible to link other services such as email to this digital transmission to enhance interaction with the service provider (Lovell, 2000).

The Digital transmission technology needs very little equipment from a student's point of view compared to Internet, which requires network access, modem, installation of software etc. Further, students need to have basic skills to operate them. In a remote area, maintenance is a problem. On the other hand, Digital technology is implemented on a modified television set to accommodate digital transmission. It is well known that all the Australian homes including remote areas have a TV set. It is also a known fact that operating a TV does not require any great learning time as compared with learning basic computing skills. Therefore, it is possible to provide distance education services using TV sets in a digital transmission mode. When provided in this mode, students can access education resources such as Library services using their TV at their own pace. Digital transmission provides facilities to fast forward, rewind, select, skip and archive materials. This perhaps will be well received by remote and rural communities due to the fact that digital transmission requires minimal resource and skills (Fell, 1999). In context of Indigenous communities, it is possible to provide educational resources through digital transmission to disseminate basic literacy and numeracy skills. This will help children to learn at their own time and pace using a modified TV set.

It should be noted that certain TV broadcasters such as the ABC already provide education services using the current form of analogue TV. However, this service is not interactive and is dependent upon the broadcasting schedule.

Students are again constrained by the fixed-schedule to avail this service, and the flexibility of learning in one's own time is restricted. This service is also one-way and does not provide for collaborative learning.

### ADVANTAGES OF DIGITAL TRANSMISSION

According to Bourke, Burden and Moore (1996), it is very important to identify or create educational environment suitable to Indigenous students in which they would like to remain to continue to learn. Digital transmission provide such an environment for learning which may be an added attraction to Indigenous children to learn without going to a physical building which may be a barrier to Indigenous children attending schools. Allocating different bandwidth during digital transmission can facilitate different levels of education. In addition, by allocating channels, information can be disseminated for different types of services. The services can be targeted towards different age groups, needs, content etc. The service can be enhanced by adding peripherals to the TV sets in terms of talking devices or keyboards if it is necessary to type answers to questions and devices that allow users to submit activities depending on the sophistication of such devices and that of the service providers.

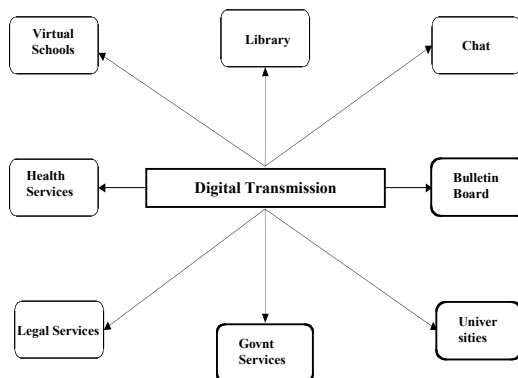
Another advantage of digital transmission is the incorporation of electronic commerce. Users of digital transmission will be able to buy and sell goods using the interactive TV concepts. This will help to project the Indigenous communities in a commercial environment (McConnel, 2000). Further, a number of additional resources such as health information, science, legal, women's issues etc. can also be provided using this transmission (Lovell, 2000).

### DISADVANTAGES OF DIGITAL TRANSMISSION

There are few disadvantages in the overall scheme envisaged. The purpose is to

suggest ways to bring about education for Indigenous communities (primary to secondary) and in particular the remote or rural communities. Digital transmission may not be able to provide the typical laboratory set up as provided in schools for purposes of learning chemistry, biology and physics. The possibility of learning these subjects by digital transmission overcoming some basic difficulties. Current discussions about digital transmission are focusing on the types of services, fees for such services, legal aspects relating to transmission and commercial organizations overcoming the barriers of the traditional broadcast service. Moreover, the nature and use of traditional broadcasting services after the advent of digital transmission is not very clear. Within Australia digital transmission is currently discussed from the commercial perspective and educational perspective is something new on the horizon and may take few years before its potential to reach rural and remote areas (McConnel, 2000). Notwithstanding the disadvantages, the idea of digital transmission within the educational perspective is outlined with the following architecture.

**Figure 1. Digital Transmission services for flexible delivery**



The above architecture provides a representation of various services that can be offered based on a uniform transmission and hence a unified view. Users of digital transmission can access these services

using an interactive mode. For instance educational materials including curriculum offered by universities can be accessed at once own pace. While such an access is attempted materials can be rewound, fast forwarded, stored and selectively chosen based on catalogue system similar to a library access. Further any intermediate services associated with educational services can also be accessed using this architecture. Links can be established to various repositories. Digital transmission architecture simulates the services provided by the Internet with a set of manageable resources. The perceived advantage of this architecture is that, services are offered under uniform code of practice as defined by National broadcasting Authority. One of the basic requirements of such a broadcasting is to reach of every Australian Home irrespective of the geographical location. Therefore there is a guarantee that the materials can be accessed. Another advantage is the standards followed in the broadcasting arena. Due to enforcements of standards, device manufacturer must adhere to standards and hence hardware equipment will meet the minimum requirement to access the materials uniformly. The limitations include quality of content preparation and its appropriateness to the customers.

## CONCLUSION

Digital transmission is just gaining momentum. A number of broadcasting companies have highlighted the importance of this technology for consumers. The transmission technology promises to offer services via TV sets to consumers. However, to realise this promise a number of other issues need to be considered. In terms of flexible delivery options, this technology appears to be an ideal solution to address some of the problems encountered by Internet technologies. To Indigenous Australians, this technology can provide some short-term solutions in addressing the numeracy and literacy issues. Due to the minimal additional learning required to access materials for

education purposes, this technology may be preferred to the Internet by Indigenous people in Australia. In addition, with education delivery as a flexible option, this technology can be used to address problems such as access to markets by linking electronic commerce resources. The technology is promising but needs to be tested!

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