PODCASTING & MOBILE LEARNING
CAN THEY AID SOCIAL INCLUSION
FOR STUDENTS WITH DYSLEXIA?

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Abstract

The paper begins by giving some background information on dyslexia. It then looks at some of the popular Assistive Technologies (ATs), that are used to increase participation by learners with dyslexia in higher education. It then looks at Podcasting and its potential use as an additional AT that may aid social inclusion for such learners. The paper then describes a study on the use of Podcasts as an AT to help enable learners with dyslexia to participate fully in higher education. The initial findings of the study show that learners that are dyslexic may benefit from aural input of information using mobile learning technology over the traditional face to face method.

Introduction

It is estimated that 10% of the population in Britain suffer from dyslexia with 4% being severely dyslexic [1]. It is therefore a highly significant condition in overall population terms and has become a major issue for education providers.

Dyslexia while traditionally thought of colloquially as a difficulty with spelling and reading, is now being recognized as a difference in cognition and learning that creates difficulties in more than just literacy skills. For instance, most people with dyslexia do not seem to develop metacognition skills automatically. This leads to problems with the organization and planning of tasks. Furthermore, social interactions can be affected by problems with verbal fluency, leading to inappropriate silences or word usage. Memory deficits and problems with eye contact can also reduce social skills. The secondary characteristics, which can develop as a result of the above difficulties, can include poor self esteem, lack of confidence, anxiety, stress, feelings of helplessness and social exclusion. Taken together all of these can militate strongly against the engagement of learners with dyslexia in education.

However, dyslexia has many positive attributes, for example most people with dyslexia are also persistent, determined, hardworking and resilient. Often the development of learning strategies to enhance their strengths and to develop greater control over their learning can reduce helplessness and anxiety. Gerber [2] has identified several factors which contribute to the success of individuals with learning difficulties; the main overriding factor is the power to take control of their lives or to feel in charge of their lives. ATs are already playing a role in this regard and are widely deployed by educational providers for the use of dyslexic learners. In particular, this paper looks at the possible benefits of podcasting in this regard. This paper begins by describing a

number of ATs used by dyslexic learners and briefly describes the podcasting approach. An experiment recently conducted by the authors is outlined and finally some conclusions are drawn.

Background to Assistive Technology for Dyslexia

Assistive Technology is any piece of equipment either hardware or software that supports an individual with a disability in living their lives. Assistive Technology is an umbrella term for a vast range of equipment and systems that are increasing all the time in sophistication and application. In the context of dyslexia and education the following are examples of commonly used ATs.

Word Processing

Many dedicated software applications have been developed in this field to help learners compensate for their language disability. However, a person may not always require such specialised software or hardware, as most computer word processing applications come with built in solutions such as spelling and grammar checking facilities and the ability to change font size and colour. These built in features allow the user to concentrate on communicating the content and context of the task, without having to worry about spelling and grammar issues. Errors are automatically highlighted when these checks are run through the relevant text. This low-cost AT option as an alternative for submitting handwritten material has greatly benefited many learners in higher education.

Text Reading Systems

Specialised software that can automatically read back text on a computer screen [3] through the computers built-in sound card, can also benefit a user struggling to keep up due to poor reading skills. Most of these applications now come with audible spell checkers and customizable word prediction features, that further assist learners in creating and modifying reports.

Voice Recognition

As an alternative to typing into a word processing application, a user simply speaks into a microphone attached to the computer to input text [4]. This method of inputting text can be up to three times faster than typing and has a high degree of accuracy.

Phonetic Spelling Systems

There are a number of solutions available for people with Dyslexia that spell words as they sound. Some software applications can provide feedback to the user as they type where words are incorrectly spelt. Phonetic spell checking, word prediction, homophone support and speech feedback can all help improve reading and writing skills. In addition there are dedicated electronic dictionaries [5] that can change incorrect phonetic spelling into correctly spelled words.

Mindmapping Software

The concept of Mindmapping was invented by Tony Buzan. Essentially it is a way of helping an individual remember, organize and connect ideas and concepts. Mindmapping is useful for taking notes, revising, summarizing and generally organizing information. Mind maps use images and words connected by lines and colour. One begins with a central topic or idea and related concepts and ideas are added. Mindmapping software allows the user to insert images from different sources to build and communicate ideas, key words are also used but it is primarily a visual method of communication.

Podcasting

An emergent technology which has the potential to add to the list of ATs for dyslexia is podcasting. Podcasting originally and most commonly describes the ability of users of portable MP3 players to register interests with a website which will then cause the user of the MP3 player to receive new or updated MP3 files reflecting their registered subject of interest. The podcast update process works in much the same way that an email client may check for new mail, instead an MP3 player can be set to check for new MP3 files meeting registered topics of interest, whenever the unit is docked and thereby connected to the internet.

Within a short time of the emergence of podcasting, educators became aware that the ubiquity of MP3 players among learners and the ease of the download facility would facilitate educational applications. They were also facilitated by the ease of the production side of podcasting which can be in contrast to the high costs associated with developing eLearning materials.

Approaches such as the use of summary podcasts can be used as cognitive scaffolds to provide support needed to accomplish learning by presenting the material in a manageable format. Memory is aided by the repetition of the material as the material can be reviewed at the discretion of the learner while mobile. This is important, as the retrieval of information for revision purposes is not automatic for individuals with dyslexia. Traditional note taking of lectures is a huge task for the working memory of any individual, the listening and comprehension, processing and organizing of information; the recording of material in a coherent manner can be very difficult for a learner with dyslexia. The use of podcasts can be seen as adapting to the learner needs as well as to the diverse learning style of learners with dyslexia.

Podcast Experiment

This study sets out to show the pedagogical benefits of using podcasts when compared to the traditional face to face method of lecture delivery for students that are dyslexic.

Theoretical background to the study

American psychologist Howard Gardner's theory of a multiplicity of intelligences posits that humans can have up to eight and possibly nine different types of intelligence.

Linguistic; Logical-Mathematical; Musical; Spatial; Bodily-Kinesthetic; Interpersonal and Intrapersonal intelligences; Naturalist and Existential make up the list.

Dyslexic learners strong in Musical intelligence may benefit from aural input of information as their ability to listen and discern may be enhanced. Gardner posits that Musical intelligence may be related to other intelligences such as linguistic, spatial or bodily kinesthetic. Educators around the world have embraced Gardner's theory [6]. They recognize that people are clever in different ways and Gardner's hope is that "more students can be reached more effectively if their favoured ways of knowing are taken into account in curriculum, instruction and assessment. Summary podcasts of lectures delivered via MP3 players could be the preferred method of information processing by students especially those with dyslexia over the more traditional methods. The ubiquity of the use of MP3 players (ipods) by all learners can be exploited in this context.

Experimental Design

The experiment involved two groups of students, a control group and an experimental group. The control group were presented with learning material in the normal face to face classroom scenario – lecture format and handout. The experimental group received exactly the same learning material via an audio MP3 file - the podcast. This content was accessed through a mobile device, an MP3 player (ipod).

There were eighteen participants in total. Six were dyslexic.

The podcasts were seventeen minutes long and the subject material was Assistive Technologies that are available in IADT in Dublin, Ireland where the students were attending college. The entire experiment was recorded with the student's permission.

They were then given an instruction page on how to operate the MP3 player and were allowed five minutes to familiarize themselves with it. The students were then asked to listen to the audio file and write down any comments, either positive or negative, about the podcast. A scored questionnaire was administered to test recall of information contained in the podcast. After the experiment a brief discussion on the technology used and the experience in general took place enabling learners to discuss any issues either good or bad they encountered while listening to the podcast. This was also videotaped with the consent of the participants for transcription purposes. This produced qualitative data for analysis.

Results and Discussion

Preliminary results show that there was no significant difference between the dyslexic and non-dyslexic groups in the ability to recall information – see figure 1. This finding is encouraging because it shows that the group of learners with dyslexia, using mobile learning technology were able to complete the learning task in the allotted time. This also allowed them to complete the scored questionnaire that was designed to test recall of the learning content contained within the lesson.

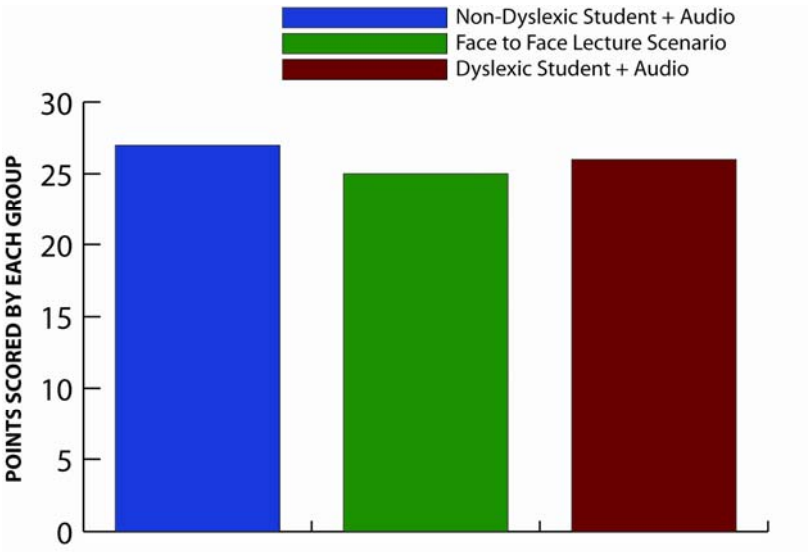

Figure 1. Bar chart showing scores for recall of the same information delivered to three groups of students using two different methods of delivery.

The Kruskal Wallis Test was performed for the three groups as above. The differences between the rank totals of rank differences in the total score for Learning of 56.5 (iPODDyslexic), 60 (iPODNonDyslexic) and 54.5 (FaceTo Face) were not significant (p=.946). The lowest overall scores were achieved by Face To Face teaching. But the frequencies here are low, differences are not significant.

In addition to the quantitative data gathered, one of the comments from a participant with dyslexia was interesting. On seeing the 10 page hard copy of the dialogue it was said "there is no way I could have read through all that, I would have given up". This particular individual scored 100% correct on the questionnaire having received the learning content via the audio file. This seems to imply that a part of the problem is overcoming the barrier of expecting failure, and once that is overcome significant achievement can ensue. Another suggestion from one of the participants was whether or not highlighting the text on screen as it is spoken might enhance the experience.

The pilot study was conducted in a laboratory type setting, ideal for measuring the participant's performance of recall of learning material and general observation. However, the authors are aware that a larger study over a longer period is required. The reason for this is to expose the concept of 'podcasts and learning in the proposed context' to the various 'threats to validity' that are inherent in most studies of this nature.

The authors also acknowledge that the scored questionnaire used was limited in scope. This issue will be addressed in a larger study to be conducted later in the year.

Between March and April 2007 the study will be expanded at IADT, Dublin. The learning content will be taken from the Psychology course syllabus and will include a number of students with dyslexia.

Conclusions

Podcasting has significant potential to connect learners to learning contexts at times and places entirely of the learner's choosing. It has little overhead expense in terms of setup or configuration and utilises a modality (hearing) which can be attended to in a large variety of settings and contexts. It contributes to a learner having greater control over their learning particularly for those who favour aural delivery. It is therefore likely to be of benefit to learners with dyslexia as it would allow the student control of the pace of delivery. Podcasting would empower the student to have control over their own learning thus enhancing self esteem. It also provides the content in a multi-sensory and manageable format thus making learning easier for the student with dyslexia. The widespread provision of podcast versions of class materials (lecture summaries) can therefore have an impact on the inclusion of learners with dyslexia in the educational process.

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