



Teaching students with dyslexia in higher education

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dyslexia

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Abstract

Purpose – The purpose of this paper is to examine the type of adjustments to delivery appropriate for students with dyslexia in a UK higher education setting.

Design/methodology/approach – A case study in a UK university department was conducted over a four-year period.

Findings – It was found that a variety of adjustments may be required for students with dyslexia in a UK higher education environment including adjustments to teaching delivery, assessment and pastoral care. In addition it is necessary to provide a managed transition from school/college/work to higher education.

Research limitations/implications – Although the case study reported here focused on only 22 students with dyslexia, the number of students entering UK higher education with dyslexia is likely to increase and institutions need to be aware of the adjustments that may potentially be required.

Originality/value – Previously few students with dyslexia had attended university in the UK. However, growing numbers of such students are now attending university, but thus far little, if any, research has been conducted regarding the adjustments that may need to be made for such students.

Keywords Dyslexia, Teaching, Higher education, United Kingdom

Paper type Case study

1. Introduction

In previous years few students with dyslexia had attended UK universities. Currently, growing numbers of such students are now attending university in the UK. However, as Madriga (2007) points out, students with disabilities are still under-represented in UK higher education. In this paper we examine the adjustments that may need to be made by UK higher education providers in order to cater for students with dyslexia.

Dyslexia can be defined as a processing difference, often characterised by difficulties in literacy that can affect other cognitive areas such as memory, speed of processing, time management, co-ordination and directional aspects. There may be visual and phonological difficulties and there is usually some discrepancy in performances in different areas of learning (Reid, 2003, pp. 4-5).

The UK Special Education Needs and Disability Act (2001) states that students with disabilities should not be discriminated against or substantially disadvantaged by higher education institutions (Perkin and Croft, 2007; Reid, 2004, pp. 118-120). Therefore there is a need to provide advice and support for higher education staff regarding the teaching of students with disabilities in general, and students with dyslexia in particular, since the condition can be difficult to understand. The difficulties of dyslexic students that affect their study skills need to be recognised by higher education institutions so that appropriate support programmes can be put in place (Hatcher *et al.*, 2002). In this paper, a four-year case study in a UK university



department will be used as a basis for informing teaching practice for students with dyslexia in the UK higher education sector.

2. Literature review

It is estimated that around six million individuals in the UK have dyslexia (BDA, 2008). The possible difficulties encountered by dyslexic individuals may include (BDA, 2008):

- Reading hesitantly.
- Misreading, making understanding difficult.
- Difficulty organising thoughts clearly.
- Poor organisation or time management.
- Erratic spelling.

However, as Reid (2004, p. 118) points out, the degree of severity of dyslexia can vary considerably between individuals. Dyslexia was officially recognised as a disability in the UK Disability Discrimination Act 1995. However, more widespread awareness of hidden disabilities such as dyslexia has often been and remains problematic (Dale and Taylor, 2001). The UK Higher Education Statistics Agency (HESA, 2008) statistics show that in the academic year 2005/2006 there were 19,740 first year UK domiciled undergraduate students in the UK with a stated disability of dyslexia.

Pringle-Morgan, a general practitioner, reported the first case of developmental dyslexia in 1896 (Pringle-Morgan, 1896). Pringle-Morgan and Hinshelwood, an ophthalmologist, speculated that such difficulties with reading and writing were due to “congenital word blindness” (Hinshelwood, 1917). The view that dyslexia was caused by visual processing difficulties was dominant for many years after their work.

There is evidence to suggest that individuals with dyslexia may have a visual processing difficulty or may have both visual and phonological difficulties (Valdois *et al.*, 2004; Frith, 1999; Reid, 2004, p. 11). In addition, it appears that working memory difficulties in dyslexia can affect performance in both the phonological and visuospatial modalities (Smith-Spark and Fisk, 2007; Jeffries and Everatt, 2004). Stein and Talcott (1999) identified visual search difficulty caused by reduced ability to correctly control ocular movements in individuals with dyslexia. Individuals with dyslexia may be less sensitive than normal readers to some variables such as contrast sensitivity and visual stimulus persistence (Lovegrove, 1993). However, some researchers consider dyslexia to be a linguistic disorder and more specifically the consequences of a disorder in phonological processing (Vicari *et al.*, 2005). Individuals with dyslexia typically have difficulty analysing and processing phonological characteristics of spoken words (Snowling, 1987; Snow *et al.*, 1998). Dyslexic individuals have been shown to have difficulties in segmenting and manipulating phones in words, limitations in performance of phonics-based memory, and problems with rapid retrieval of phonological information from long-term memory (Tijms, 2004).

Dyslexic individuals can differ in the extent to which they can use phonological reading and spelling strategies. Some research has indicated that variations in the severity of a dyslexic individual’s phonological deficit may determine their reading profile (Snowling, 2001). Simmons and Singleton (2000) commented that dyslexic students in higher education appear to have reading comprehension difficulties that cannot be accounted for by an inability to decode individual words in a passage of text,

but rather have difficulty in constructing inferences when processing a passage of text. Bacon *et al.* (2007) suggested that individuals with dyslexia appear to be inclined to conceptualise information in a visuospatial rather than a verbal manner.

Overall, there appears to have been only limited research into the experiences of students with dyslexia in higher education (Carrol and Iles, 2006; Ingram *et al.*, 2007; Madriga, 2007; Mortimer and Crozier, 2006) and in particular with regard to the adjustments that may be required for such students. The originality of this research is the analysis of the adjustments that may be necessary for students with dyslexia in a UK higher education environment.

3. Methodology

The research method used for the research reported in this paper was the case study research method. The research was based upon longitudinal case studies in a UK university computing department. Reid (2004, p. 114) commented that computing work is usually a very popular choice for dyslexic adults. Powell *et al.* (2004) found that the visualization skills possessed by many individuals with dyslexia are suited to the problem definition and synthesis elements of computer program development. The longitudinal case study was conducted over a four-year period. The actual research techniques used for the research project were interviews, discussions, and observation of staff and students involved in special educational needs provision within the university department studied, and the examination of relevant academic, administrative and technical documentation relating to special educational needs provision. Those interviewed and observed during the research exercise included administrative staff, technical staff, welfare staff (in particular welfare advisors for disabled students), and academic staff (in particular programme leaders, year tutors and personal tutors) as well as students with dyslexia within the university department studied. The research reported in this paper was undertaken with due regard to the confidentiality and anonymity of those involved.

The research project focussed on 22 students with dyslexia out of a running total of approximately 80 students (at any given point in time) with stated disabilities within the university department over the four-year period studied. Six of the students studied had completed the final year of their course and the research exercise tracked them through the three academic and one placement year of their studies. Five students had completed their placement year, and seven had completed the second year of their course, with data regarding these 12 students being available for the two academic years and one placement year of their studies. Three students had completed the first year, and one had withdrawn during the first year of his course, for these students only one year's data was available.

A longitudinal case study approach was adopted in order to examine the progress of students with dyslexia through three academic years and one placement year of their computing courses. However, since there were only six such students in the department within the four year timeframe studied, students with dyslexia who had completed the second and first, and just first year of their course were also included in order to attempt to identify patterns of necessary adjustments across a more statistically significant number of students (22).

The data collected regarding the 22 students mainly concerned: how the students coped with teaching and assessments and what types of adjustments were made for

the students. The data collected was analysed by tabulating the data obtained from the different sources for the 22 students with regard to teaching, assessment, pastoral care, and the transition from school/college/work to higher education. This enabled comparisons of the difficulties faced by these students and the adjustments required for them.

The research questions covered by the research exercise included:

- (1) How should the transition from school/college/work to higher education be managed for students with dyslexia?
- (2) What provision is appropriate in higher education for students with dyslexia?
- (3) How should students with dyslexia be taught in a higher education institution?
- (4) How should students with dyslexia be assessed in a higher education setting?
- (5) How should students with dyslexia be supported in a higher education setting?

These research questions are important because under UK law, higher education institutions should not substantially disadvantage students with disabilities (SENDA, 2001, section 28) and should not discriminate against disabled and prospective students (SENDA, 2001, section 26).

4. Provision for students with dyslexia in UK higher education

The UK Special Education Needs and Disability Act (2001) (SENDA, 2001) sections 26,27 and 28 attempt to ensure that UK higher education providers make reasonable adjustments to their delivery so as to cater for students with disabilities (McAulay, 2005). The aim of the research reported in this paper was to examine and evaluate what is reasonable and appropriate in terms of adjustments to cater for students with dyslexia in a HE context.

4.1 Managing the transition from school/college/work to university

The transition from school/college/work to a full time university course can potentially be stressful for any student. For students with dyslexia this can possibly be even more daunting (Carrol and Iles, 2006; Mortimore and Crozier, 2006). Although there has been investment in UK further education provision for students with learning difficulties, this has not been reflected in the UK higher education sector (Boxall *et al.*, 2004). Discrimination within the UK higher education sector continues to be justified under the guise of maintaining academic standards (DRC, 2002).

A total of 18 of the 22 students in the case study group started at the case study university directly from school or college, whilst four of the case study group students were mature students who came from a variety of work backgrounds. Within the university studied all students who declared a disability on their application form (or who declared a disability upon arrival at the university) were booked an appointment with the central disability support staff. The purpose of the meeting was to ascertain the level of the student's disability and to develop a plan for supporting the student throughout his / her course. This was formally documented in an individual student learning plan (ISLP) that was signed by one of the central disability support officers, the student concerned and the special educational needs co-ordinator in the university department in which the student was based.

Reid (2004, p. 120) noted that it is the higher education institution's responsibility to make reasonable adjustments in an anticipatory manner, meaning that the institution has to pre-plan to ensure that it is equipped to deal with the range of needs that can be required by students with a disability.

Students with dyslexia were asked to undertake a dyslexia assessment that was administered by an external agency (unless the student had undergone a recent assessment by an approved assessor). Dyslexia is one of the few educational needs where private independent assessments can be as commonplace as school-administered assessments (Reid, 2004, p. 17). Assessments will typically include cognitive tests that measure ability, attainment tests that measure performance, or skill specific tests that measure factors such as balance and visual acuity. The results of the assessment, together with discussions with the student were then used to determine what was required in the Individual Student Learning Plan for the student concerned. In addition, the results of the assessment could then potentially be used to claim the disabled student's allowance (DSA, 2008) via the student's local education authority, and or an allowance from charities that supported students with dyslexia. Six of the 22 students in the case study group received the disabled student's allowance.

Only one of the 22 students studied provided a dyslexia assessment that had been privately undertaken at an established dyslexia assessment centre. Six of the students provided a dyslexia assessment from their school/college that had been undertaken since age 16. Six of the students undertook a dyslexia assessment arranged through the central disability support service within the university studied. Although nine of the students had declared dyslexia on their university applications, none of these students provided or undertook a dyslexia assessment nor did they request any types of adjustment. All of the students that applied for the disabled student's allowance undertook a dyslexia assessment through the university, apart from one student that provided a privately undertaken dyslexia assessment.

It is important that assessments and applications for the disabled students allowance are done in a timely manner so that the student can receive any equipment/software provided through the disabled student's allowance before they start their higher education course. In addition, for some students with dyslexia a note taker may be required in teaching sessions. Making the arrangements for a note taker would also need to be done before teaching actually starts.

4.2 Adjustments to teaching delivery

The adjustments that were found to be required to teaching delivery for the students with dyslexia studied for this research exercise included:

- Large font versions of printed handouts in lectures/tutorials/lab sessions. Larger font sizes for printed materials can be beneficial for reading rate for some dyslexic students (O'Brien *et al.*, 2005). Only one of the 22 students requested large font versions of printed handouts.
- Use of coloured paper for printed handouts in lectures/tutorials/lab sessions. Coloured paper for printed materials can be beneficial for some students with dyslexia. This is thought to alleviate symptoms associated with impairment of the magnocellular component of the visual system (which responds to contrast and movement) (Singleton and Henderson, 2006). The use of coloured paper can

be preferred to the use of tinted lenses (Whiteley and Smith, 2001), which some students may feel are awkward and embarrassing to wear (King, 2000). Only two of the 22 students requested coloured paper for printed handouts.

- Use of laptop computers by students in lectures/tutorials/laboratory sessions. The use of laptop computers by students with dyslexia in tutorial and laboratory sessions was supported by a group of computing technicians within the department studied who ensured that the students' laptops could connect to the university computer network and could run the software required during the teaching sessions. Only two of the 22 students used laptop computers in teaching sessions.
- Additional central learner support sessions (group/individual) for report writing and basic mathematical skills. The university studied provided additional learner support in the form of small group classes for report/essay writing and basic mathematics. Students with dyslexia could also be provided with one to one learner support sessions in basic mathematics and report/essay writing if appropriate. Only one of the 22 students requested one to one learner support sessions.
- Use of a virtual learning environment (VLE). In common with many other UK universities, the case study university had adopted the Blackboard system as the university wide VLE. Although the use of the Blackboard system varied throughout the university department studied, as a minimum, lecture and assessment materials were always available via the system. Gerrard (2007) commented that students with dyslexia considered it useful to have lecture notes available prior to lectures, and also this could prevent the embarrassment that some students might feel regarding being given lecture notes on coloured paper, which could identify them as being different to their peers. The Blackboard VLE ensured that information and resources were available to all students, and thus contributed to an inclusive curriculum (SEND, 2001). All of the 22 students studied made use of the Blackboard system in use at the university studied.

Reid (2004, p. 3) commented that there are many ways of learning including the use of pictures (visual) or through experience (kinaesthetic). However, the majority of teaching, especially at university level is auditory, that is learning through listening and understanding through sound. Current research indicates that individuals with dyslexia have a phonological difficulty, meaning that they have difficulty with sounds. Ideally teaching sessions should attempt to include some pictorial and experiential learning materials that can be beneficial for dyslexic students (as well as for non-dyslexic students). Fortunately, all the computing courses in the university department studied typically included a significant proportion of computer use (which allowed kinaesthetic learning) and a significant use of diagrammatical techniques such as dataflow diagrams and entity relationship diagrams (which allowed visual learning).

4.3 Adjustments to assessment practices

The adjustments that were found to be required to assessment practices for the students with dyslexia studied for this research exercise included:

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- Extra time in examinations.
 - Use of a computer for both formal examinations and in-class assessments.
 - Provision of an amanuensis in examinations.
 - Large font versions of examination papers.
 - Use of coloured paper for examination papers and examination scripts.
 - Extra time for courseworks.
 - Alternative forms of assessment.

Williams *et al.* (2006) commented that computers can be beneficial for assessment purposes for students with a range of disabilities, especially dyslexia. Ingram *et al.* (2007) noted that some UK universities identify dyslexic students when written work is submitted by using “special needs stickers”. However, “special needs stickers” were not used in the university department studied. Reid (2004, p. 118) commented that in addition to other forms of assessment, students with dyslexia may often find it difficult to give oral presentations. Although not required by any of the 22 students with dyslexia studied, if appropriate, the university studied allowed appropriate alternatives to presentations (e.g. written reports) to be used for assessment. Such alternatives had been used for students with autistic spectrum disorders within the university department studied.

In total, 12 of the 22 dyslexic students studied (55 per cent) requested extra time in examinations. Four of the 22 students (18 per cent) requested the use of a computer in examinations. Two of the 22 (9 per cent) used an amanuensis in examinations. Two students (9 per cent) requested examination papers and examination scripts on coloured paper, and one student (5 per cent) required large font versions of examination papers. Extra time for courseworks was granted to the students dependant upon the nature and timescales of the courseworks concerned and the circumstances of the individual students.

4.4 Adjustments to pastoral care

Academics need to be aware that students with dyslexia can potentially struggle with (apparently) simple tasks and require support and understanding to achieve their potential (Ingram *et al.*, 2007). Richardson and Wydell (2003) found that UK higher education students with dyslexia were more likely to withdraw during their first year of study and were less likely to complete their programmes of study, although with appropriate support the completion rate of students with dyslexia can match that of students with no disabilities. Out of the 22 students studied, only one withdrew during the four-year timeframe of the research project, with the withdrawal occurring during the first year of the course.

Polychroni *et al.* (2006) commented that students with dyslexia appear to display lower academic self-concept than their mainstream peers in most areas of learning except with regard to practical ability. In addition, Carrol and Iles (2006) found that dyslexic university students had higher levels of trait anxiety than non-dyslexics with respect to both academic and social situations. Dyslexic university students also showed higher levels of state anxiety when faced with a situation in which their reading abilities will be tested.

Overall the 22 students studied generally appeared to perceive that they could complete all of the tasks required of them on their course. However, they might need slightly more time, or the use of a few slight alterations (such as the use of a computer in examinations) in order to achieve the tasks required.

Out of the 22 students studied, only two that had a more severe form of dyslexia had regular contact (typically more than once per month) with the special educational needs co-ordinator within the department studied. Such contact was mainly concentrated around the start of teaching in each semester, and just before examination periods.

5. Evaluation of adjustments for students with dyslexia in an HE setting

In terms of course completion, only six of the 22 students in the case study group had actually yet completed their four-year sandwich course, and hence had three academic year's and one year's placement data available. Five students had completed their placement year; seven had completed their second year, and hence had two year's academic and one year's placement data available. Three had completed their first year, and thus had only one year's academic data available. Only one of the 22 students studied had withdrawn from their course over the four-year period concerned. This student had withdrawn for personal reasons within the first year of their course.

In terms of the academic performance of the students in the case study group, the average first year mark for the 22 students studied was just under 57 per cent with a standard deviation of 9.8. The average first year marks ranged from 38.1 per cent to 75.1 per cent. The average second year mark was 56 per cent with a standard deviation of 11.4. The average second year marks ranged from 25.7 per cent to 76.4 per cent. The average final year mark was 55 per cent with a standard deviation of 10.5. The average final year marks ranged from 34.6 per cent to 64.7 per cent. Overall, the marks for the students studied compared well to the averages for their respective student cohorts. Overall, this appeared to indicate that the provisions made for the group of dyslexic students studied allowed them to perform at a roughly equivalent level to their non-dyslexic peers.

An interesting pattern emerged when the average marks for those students with dyslexia that requested extra time in examinations was compared with those students that did not request extra time. The average marks for the first, second and final academic years were consistently higher for those that requested extra time in examinations. The standard extra time allowed in examinations for students with dyslexia in operation in the university studied was 25 per cent. Thus a two-hour examination would be extended to two and a half hours. The first year averages of those students with dyslexia that requested extra time in examinations was 57.3 per cent compared to 49.4 per cent for those students that did not. The second year averages were 61.8 per cent (for those that requested extra time in examinations) compared to 52.0 per cent. The final year averages were 61.8 per cent (for those that requested extra time) compared to 48.7 per cent. This would appear to indicate that extra time in examinations was beneficial for the students with dyslexia studied, given that there were no overall discernable differences in the academic attainment level at entry of the two groups (those that requested extra time in examinations, and those that did not). However, given the small sample sizes, it would be inappropriate to attempt to generalise this finding in any way.

6. Conclusion

This paper has attempted to outline a number of areas that need to be addressed in higher education with regard to meeting the needs of students with dyslexia. UK higher education institutions are required to make reasonable adjustments for students with a disability in an anticipatory manner. It is hoped that the topics covered in this paper may be useful to staff in other UK higher education institutions to make them aware of the potential adjustments that may be required for students with dyslexia.

In particular, it is important that the transition from school/college/work to higher education is professionally managed and that students with dyslexia are assessed in a timely manner. This is required so that applications for the disabled student's allowance (if appropriate) can be processed so that any equipment or software required is available before the start of the academic year.

In addition, it is important that it is agreed with each individual student what adjustments are appropriate to him or her. Since there can be a large variety in the severity of dyslexia between individuals, it would appear inappropriate to make the same adjustments for every student with dyslexia. Furthermore, ultimately, it is what the student feels that he or she requires to support his or her studies that should be used as the basis for agreeing the adjustments to be applied. Given appropriate adjustments, the research exercise appeared to indicate that dyslexic students can achieve results similar to their non-dyslexic peers in higher education.

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