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## **What are the reported Executive Functioning skills deficits in students with Specific Learning Difficulties compared to other students in higher education? (0125)**

### **Background**

There is evidence that students with Developmental Coordination Disorder (DCD) experience problems relating to executive functioning (EF) skills such as time management, planning and organisation affecting their ability to cope in Higher Education (HE) ( Kirby et al, 2008). HE institutions are challenged with providing appropriate support – practical, financial and academic – to increase the likelihood of academic success.

### **Aims**

1. To investigate the level and range of difficulties related to EF in students with DCD compared with those with Dyslexia, and controls all attending higher education.
2. To compare and contrast methods of study support.
3. To identify areas where additional support could improve academic success for students with learning difficulties and to consider the implications of this for support in university and in early intervention.

### **Method**

Students were recruited from different universities and from The Dyscovery Centre database in order to recruit 4 groups of students:

1. Students diagnosed with DCD
2. Students diagnosed with Dyslexia
3. Students with DCD+ Dyslexia
4. Students with no formal diagnosis

### *Questionnaire*

A questionnaire was developed with 6 areas – a) Planning, b) Organisation, c) Inhibition/impulse control, d) Working memory, e) Metacognition and f) Time management.

In addition, the students were provided with a 20-item list to record the frequency of using tools (if at all) that may guide them to be 'more organised' e.g. using a diary, calendars, computer software etc..

### Analysis

Descriptive statistics were used to describe the student population which revealed that there was a sub-group of students who did not have a formal diagnosis of a Specific Learning Difficulty (SpLD) but rated themselves as having some study difficulties. DCD, Dyslexia, DCD and Dyslexia, no formal diagnosis but difficulties experienced and no formal diagnosis were used as grouping variables.

### Results

353 students completed the survey. Table 1 describes the student sample - there were significantly more females in the 'no diagnosis/difficulties' group ( $\chi^2=34.35$ ,  $df=8$ ,  $p<0.000$ ).

Table 1	Frequency % (n)	Male % (n)	Female % (n)	Mean Age (sd)
DCD	6.1 (20)	35.0 (7)	65.0 (13)	23.90 (5.59)
Dyslexia	16.8 (55)	52.7 (29)	47.3 (26)	24.85 (8.83)
DCD and Dyslexia	4.0 (13)	38.5 (5)	61.5 (8)	25.77 (9.63)
No formal diagnosis	56.4 (185)	59.0 (108)	41.0 (75)	26.86 (9.68)
No formal diagnosis but difficulties	16.8 (55)	21.8 (12)	78.2 (43) *	27.17 (8.55)

### Key points from the Executive Functioning scale:

- There was a significant difference between the no diagnosis group and the other sub-groups for all six of the EF domains ( $F(1, 322)=17.80$ ,  $p<0.000$ )
- There was no difference between planning skills of the DCD, DCD/Dyslexia or Dyslexia groups
- The DCD and DCD/Dyslexia groups scored significantly lower on the organisation scale than the Dyslexia group ( $F(1,322)=23.53$ ,  $p<0.000$ )
- The DCD and DCD/Dyslexia groups scored significantly lower on the impulse control scale than the Dyslexia group ( $F(1,322)=25.91$ ,  $p<0.000$ )
- There was no difference in the working memory scores for the DCD, DCD/Dyslexia and Dyslexia groups but they all scored significantly lower

working memory scores than the no diagnosis but difficulties group ( $F(1,322)=43.34, p<0.000$ )

- The DCD and DCD/Dyslexia groups scored significantly lower on the metacognition scale than the Dyslexia group ( $F(1,322)=21.66, p<0.000$ )
- The no diagnosis but difficulties group scored significantly higher on the time management scale than the DCD and DCD/Dyslexia groups but not the Dyslexia group ( $F(1,322)=20.75, p<0.000$ )

In terms of the tools used to assist learning; the DCD group were significantly less likely to use folders ( $\text{Chi-squared}=18.55, df=4, p<0.001$ ) than the DCD/Dyslexia, Dyslexia, no diagnosis but difficulties and no diagnosis groups. The DCD group were also significantly more likely to use speech to text software ( $\text{Chi-squared}=13.36, df=4, p<0.010$ ) as tools to aid study and organisation than the other groups.

## **Conclusions**

The level and usefulness of support provided during HE impacts strongly on the academic success of students with SpLDs. The findings provide evidence for difficulties experienced in each EF domain by students with DCD and Dyslexia and these results will help inform possible future support strategies in HE. Apart from text to speech software, students with DCD are not making use of the resources available to aid study and organisation. Further research is needed to investigate the underlying reasons for this. The study also revealed a relatively high number of female students reporting difficulties but who are undiagnosed.