College Preparedness and Time of Learning Disability Identification

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ABSTRACT: ***This paper discusses the results of the Learning and Study Strategies Inventory (LASSI) administered to college students in order to identify similarities and differences between time of diagnosis of a learning disability and the development of learning strategies related to will, self-regulation, and skill components. Findings indicate that early identification (in K-12) and providing students with test-taking strategies may ameliorate academic success in higher education for students with learning disabilities. Recommendations for action will assist developmental educators to better serve college students with learning disabilities in higher education.***

Students learn by becoming involved.

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Murray, Goldstein, Nourse, and Edgar (2000) observed that high school graduates with learning disabilities (L.D.) were significantly less likely to attend a postsecondary institution or to "have graduated from postsecondary programs throughout the first 10 years following high school" (p. 119). However, research indicates that the number of students with learning disabilities attending postsecondary institutions is on the rise (Henderson, 2001; Ward & Merves, 2006). In addition, the number of adults returning to higher education is increasing (Schuetze & Slowey, 2002), and older students may have had a lesser chance of L.D. diagnosis in primary or secondary schools due to the lack of a consistent definition of *learning disability*.

Annually since 1966, the Cooperative Institutional Research Program (CIRP) of the University of California, Los Angeles has administered a national survey to a large sample of 4-year college freshmen in the United States; one measure that appears every 4 years asks freshmen whether they have a disability (Ward & Merves, 2006). Among college freshmen with disabilities the most commonly identified category of disability was that of learning disabilities. Data indicated that 2.8% of all entering freshmen self-reported a learning disability (Ward & Merves). This is a relative increase in the number of students with learning disabilities attending college as compared to 2.4% in 2000, 2.6% in 1998, 2.3% in 1996, and 2.0% in 1994 (Henderson, 2001).

In Canada, of those "aged 16 to 21, slightly more than one person in 100 (1.1%) aged 16 to 21 said that they had a learning disability on the 2001 Participation and Activity Limitation Survey (PALS)" (Learning Disabilities Association of Canada, 2007a, p. 1), and 15.4% of the national percentage reported attending university, with or without a degree (Learning Disabilities Association of Canada, 2007a). There is a gap in the literature related to the enrollment rate of students with learning disabilities in Ontario colleges and universities, which is where the current study took place.

Research indicates that students with learning disabilities may arrive on college campuses with slightly different characteristics than their peers without learning disabilities, characteristics which may cause them to place into developmental courses. They are characterized as having higher levels of anxiety, taking less responsibility for their own learning, and having a lesser repertoire of learning and study strategies (Kovack & Wilgosh, 1999). On the positive side, postsecondary students with learning disabilities can have a more positive attitude toward college success compared to their peers (Kovack & Wilgosh). Further, according to Kirby, Silvestri, Allingham, Parrila, and La Fave (2008), subsequent to applying the Learning and Study Strategies Inventory (LASSI) in Canada, students "without dyslexia obtained significantly higher scores than students with dyslexia in their reported use of selecting main ideas and test taking strategies" (p. 85).

Although there have been noted discrepancies in the statistical significance of the content constructs of the LASSI (Cano, 2006), low LASSI scores have been shown to correlate with a lack of academic success. Proctor, Prevatt, Adams, Reaser, and Petscher (2006) compared three academically struggling groups of college students: (a) low GPA, (b) clinic-referred for L.D. testing, and (c) clinic-referred for psychoeducational testing. All three groups displayed weaknesses in study skills relative to their comparison groups; that is, in comparison with students who were not struggling. Areas identified as weaknesses for all three groups included Anxiety, Concentration, Motivation, Selecting Main Ideas, and Test Strategies. Further Albaili (1997)

observed that when comparing low, average, and high achieving college students based on their GPA scores, findings indicated that "low-achieving students scored significantly lower than the average and high-achieving students on all the scales" (p. 171) of the LASSI.

In measuring the learning and study skills strategies of students utilizing the LASSI few studies offer insight into the demographics of learners with L.D. One study primarily focused on college students with Attention Deficit Hyperactivity Disorder and compared them to their peers with learning disabilities and college students with no disabilities. Reaser, Prevatt, Petscher, and Proctor (2007) found that of the 10 scales on the LASSI, college students with learning disabilities scored lower than their peers without disabilities on all the scales except the Study Aids scale on which they scored better than their peers without disabilities.

Further confounding the integration of postsecondary students with learning disabilities is the issue of late identification of disability. In Ontario, identification of learning disabilities can occur as late as at the postsecondary level, which causes a delay in receiving services (Abreu-Ellis, 2008). In fact, this issue has become imperative: "It's essential that early identification, interventions and support be put in place for ALL Canadians" (Learning Disabilities Association of Canada, 2007a, ¶ 10). Therefore, it is valuable to examine the impact of the time of learning disability identification on college student success.

The purpose of this study is to identify similarities and differences between time of diagnosis of a learning disability and the development of learning strategies related to will, self-regulation, and skill components by analyzing the results of the LASSI administered to students with varying times of diagnosis. As well, results of the university students with learning disabilities are compared to normed values of the LASSI in an attempt to measure a difference between characteristics of students with learning disabilities and their peers without learning disabilities.

Developmental Education and College Students

What students need to thrive in the college environment has been a topic of concern to student development theorists. Astin (1987) proposed a theory of involvement stating that "students learn by becoming involved" (p. 133). Further, he found that students' affective and cognitive development can be enhanced by participation in various academic and nonacademic activities during their college experience. In terms of student development, Astin (1993) found that a student who "spends a considerable amount of time studying, attending classes, and using a personal computer, as well as engaging in academically related activities that would be inclined to elicit a high degree of student involvement" (p. 382) has a better chance of succeeding in the college experience. Researchers have observed a multiplicity of factors that influence academic performance and student development in college, including out-of-class experiences (Terenzini, Pascarella, & Blimling, 1996), environment (Astin, 1993; Kuh, 1996), and classroom climate (Blocher, 1978). These factors have enlightened college personnel and led them to develop appropriate programs to serve 1st-year college students in order to reduce drop-out rates and promote retention. Some of these programs include remedial classes, counseling services, tutoring, and learning communities to facilitate student engagement and academic performance.

Students with learning disabilities attending college were found to express difficulties in reading, mathematics, and writing due to the nature of their learning disabilities. Hughes and Smith (1990) observed that "college students with LD do not read as well as their nonhandicapped [sic] peers…given the high volume of reading required in postsecondary settings, college students with LD are at a distinct disadvantage" (p. 71). Further, they found that students with learning disabilities experience difficulties in basic computations and application to more complex and abstract mathematics such as geometry and algebra (Hughes & Smith). They also noted "written expression appears to be one of the most pervasive problems for college students with learning disabilities" (p. 73). It is important to note that not all students with learning disabilities will experience difficulties in all three academic areas.

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The increase of students with learning disabilities and their corresponding academic needs enhanced the development of new programs to serve this population in the postsecondary setting. Rath and Royer (2002) reviewed the literature pertaining to services provided to students with learning disabilities at colleges and found that research focused on academic environment as well as on the cognitive and affective needs of the student:

> The approaches for changing the academic environment in an effort to increase the likelihood that a college student with a learning disability succeeds consist of (a) providing students with disabilities with assistive technologies and programs, (b) creating changes in programs of study, and (c) providing students with direct academic assistance in the form of tutoring and special help. Approaches that are directed at changing the student include (a) providing therapy and counseling, (b) teaching students to use learning strategies, and (c) designing programs to strengthen weak academic skills. (p. 360)

Services Provided to College Students with Learning Disabilities

Canada parallels the United States in relation to services provided to students with disabilities in educational settings in many ways. There are two major differences between these two countries: (a) there is not federal law that mandates access to special education services in Canada, and in the United States education services are federally mandated (Individuals with Disabilities Education Act and Americans with Disabilities Act); and (b) provinces are autonomous in determining the provision of services available to students with disabilities whereas in the United States, individual states must comply with federal legislation (Abreu-Ellis, 2008).

In 1997, the Ministry of Training, Colleges and Universities (MTCU) in Ontario, Canada supported the initiation of the Learning Opportunities Task Force (LOTF) which informed colleges and universities that they would fund projects that supported the following mandate:

> Improve the transition of students with specific learning disabilities from secondary school to post-secondary education, and to enhance the services and supports that students with learning disabilities receive within the post-secondary educational sector, such that they can complete their education successfully. (Learning Opportunities Task Force, 2002a, p. 1)

After extensive review of the proposals "LOTF established eight pilot projects in thirteen postsecondary educational institutions" (Learning Opportunities Task Force, 2002a, p. 1). The LOTF project determined the diagnostic criteria to be used as defining *learning disability* in order to participate in the project. The LOTF Final Report (2002b) stated that staff in pilot institutions reported "many students (over 80% of the pilot students) arrive at the college or university with inadequate documentation of their learning disabilities. This is in spite of the mandated identification and special education service provision

of the Ontario's Education Act" (p. 16) which "includes provisions to address the needs of students with disabilities who have been identified as 'exceptional pupils.' School boards must provide special education programs and services to these students" (Ontarians with Disabilities Act, 2001, S.O.2001, c.32).

Universities in Ontario follow the guidelines provided by the MTCU, LOTF, and Learning Disabilities Association of Ontario (LDAO) in the provision of services to students with learning disabilities. Also, disability offices in the province are expected to submit a yearly report to the Ministry of Training, Colleges and Universities (MTCU) on the number of students with disabilities served by the office and the type of services provided to these students, especially students with learning disabilities.

In 2002, LOTF recommended to the MTCU that colleges and universities in Ontario hire full-time staff with expertise in technology and learning strategies to assist students with learning disabilities. Therefore, a project called Enhanced Service Funding (ESF) was financed by the task force to provide individualized learning strategies and assistive technology to students with learning disabilities. As a result, colleges and universities in Ontario have individuals with expertise in learning strategies and/or assistive technology who work specifically with students with learning disabilities (Learning Opportunities Task Force, 2002b). These initiatives, which focus on the integration of developmental programs that work together with curriculum intervention to enhance student learning, are supported by the proponents of developmental education. Research in developmental education advocates for the development of learning strategies (Arendale, 2000) as well as the incorporation of these strategies into the curriculum as opposed to offering remedial programs alone (Brothen & Wambach, 2004; Grubb, 1999).

Methodology

Instrument

We have applied the Learning and Study Strategies Inventory (LASSI) as the instrument for this study. It is a 10-category scale, 80-item assessment that measures "students' awareness about and use of learning and study strategies related to skill, will and self-regulation components of strategic learning" (Weinstein & Palmer, 2002, p. 4). The 10 categories that are measured by the LASSI are Anxiety, Attitude, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self-Testing, Study Aids, Test Strategies, and Time Management. The minimum possible score for each scale of the LASSI is eight and the maximum possible score is 40.

The LASSI instrument can be used for diagnostic purposes because "it provides students with a diagnosis of their strengths and weaknesses, compared to other college students" (Weinstein & Palmer, p. 4). Further, the authors suggest that there is as a prescriptive component to the instrument in that it provides feedback in the areas of weaknesses. Research has been performed utilizing the LASSI instrument with secondary school students with learning disabilities; findings suggest that the LASSI can "provide useful diagnostic and prescriptive information that can help to individualize learning and study skills programs at [the] secondary school level" (Benz, Fabian, & Nelson, 1996, p. 349).

Participants

Forty-five participants were included in the data set for this study. Of these participants, 32 were women and 13 were men. All participants were registered with the Disability Services Office at a 4-year university in Ontario, Canada. They all had a recent psycho-educational assessment (3 to 5 years old) and were diagnosed with a learning disability. Their documentation indicated the time of diagnosis. As part of this study, participants were grouped into two distinct categories—those who had received a diagnosis in kindergarten through 12th grade (K-12; $n = 22$) and those who had been first diagnosed in postsecondary education ($n = 23$)—to see if there was a significant difference between the two groups' mean scores on the categories of the LASSI. Participants ranged in age from 17 to 29 years old. Twenty-two participants were between 17 and 19 years old. Fifteen participants were between 20 and 22 years old, three participants were between 23 and 25 years old, four participants were between 26 and 28 years old, and one participant was between 29 and 31 years old.

Data Collection and Analysis

This research study used existing data from the Office of Disabilities at the participating university. Participants were asked to fill out the LASSI survey as soon as they registered with this office. The survey results were used to guide the Learning Strategist in working with students with learning disabilities to facilitate the development of appropriate programs. All identifiers were removed from each survey, and the data were analyzed using both descriptive statistics and *t*-tests for independent means.

Results

One-sample *t*-tests were performed to assess the difference between the sample of 45 university students with learning disabilities and the scaled scores for the normed sample (identified in Weinstein & Palmer, 2002) of the LASSI. The scaled scores from the normed sample on the LASSI were considered population values. A significant statistical difference was found in the following categories: Anxiety ($p = .001$), Attitude ($p = .008$), Concentration ($p = .002$), Selecting Main Ideas ($p = .000$), Study Aids ($p = .033$), and Test Strategies ($p = .000$). Table 1 includes complete details of all categories.

One-sample *t*-tests for independent means were performed to analyze the difference between two subgroups of the university students with learning disabilities and the 10 categories of the LASSI. The two subgroups were individuals who had been diagnosed and provided with education accommodations in K-12 segments of education and individuals who had been diagnosed and provided accommodations in postsecondary education. Results indicated that, within the 10 categories of the LASSI survey,

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Table 1

One-Sample* t*-Test Results Comparing Means of Students with Learning Disabilities and the Normed LASSI Sample

LASSI Category	*t*	*df*	Sig. (2-tailed)	*M*	Mean Difference	*SD*
Anxiety	-3.648	44	.001	21.16	-4.364	8.025
Attitude	-2.783	44	.008	31.82	-1.588	3.827
Concentration	-3.241	44	.002	23.87	-3.103	6.423
Information Processing	-.568	44	.573	26.78	-.472	5.580
Motivation	-1.273	44	.210	30.09	-1.101	5.803
Self-Testing	-1.370	44	.178	23.20	-1.330	6.511
Selecting Main Ideas	-4.587	44	.000	24.07	-3.993	5.840
Study Aids	2.196	44	.033	26.82	1.572	4.802
Time Management	.479	44	.634	26.67	.587	8.213
Test Strategies	-5.345	44	.000	25.13	-3.997	5.016

Table 2
Equality of Means* t-*Test by Time of Student Diagnosis

LASSI Category	*t*	*df*	Sig. (2-tailed)	*M* K-12	*M* Post-Secondary	Mean Difference	*SD* K-12	*SD* Post-Secondary
Anxiety	1.334	43	.189	22.77	19.61	3.164	7.715	8.178
Attitude	1.411	43	.165	32.64	31.04	1.593	3.922	3.649
Concentration	1.162	43	.252	25.00	22.78	2.217	5.529	7.128
Information Processing	-.059	43	.953	26.73	26.83	-.099	5.816	5.474
Motivation	1.514	43	.137	31.41	28.83	2.583	5.369	6.035
Self-Testing	.345	43	.732	23.55	22.87	.676	6.801	6.355
Selecting Main Ideas	1.808	43	.078	25.64	22.57	3.071	6.470	4.841
Study Aids	.736	43	.466	27.36	26.30	1.059	4.192	5.363
Time Management	.120	43	.905	26.82	26.52	.296	8.387	8.229
Test Strategies	2.240	43	.030	26.77	23.57	3.208	5.546	3.964

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only one category was found statistically significant at a confidence level of 95% in comparing the two groups: Test Strategies (p = .030). See Table 2 for complete categorical results.

Over the total eight items or questions on the LASSI Test Strategies Scale, a significant difference was found in two items between students who were diagnosed with a learning disability in K-12 and students who were first identified in postsecondary education. These items were "In taking tests, writing papers, etc., I find I have misunderstood what was wanted and lose points because of it" (p = .030), and "When I take a test, I realize I have studied the wrong material" (p = .017). Participants who were identified in the K-12 educational setting indicated that they were less likely to self-identify as demonstrating these behaviors than those students identified with a learning disability in higher education.

Discussion

Foley (2006) observed that students with learning disabilities arrive on "college and university campuses with varying levels of skills and degrees of preparation, and they have experienced varying degrees of success as undergraduates" (p. 642). Success rates are comparatively low for students with learning disabilities in higher education. Although level of preparedness may vary in degree, "prerequisite cognitive and academic skills required for success in higher education are similar for all students" (Foley, p. 642). Some of these skills include general knowledge, critical thinking abilities, analytical and problem solving skills, and writing skills (Astin, 1993).

Horn and Berktold (1999) noted that, compared to their peers without disabilities, students with disabilities in postsecondary education were more likely to have attributes associated with lower rates of persistence and degree attainment. Speculation of the reasons behind this lack of success is represented in the research literature which characterizes students with learning disabilities as having difficulties in reading; challenges in remembering enough details to enable them to show evidence of knowledge, especially in writing; and insufficient time and difficulties in organization and management of their time (Heiman & Kariv, 2004). As Heiman (2006) observed, "the majority of individuals with LD accepted to universities have an average or above average IQ, but also unique difficulties (reading, writing, mathematical thinking, attention, etc.) that pose obstacles in the learning process" (p. 462).

The present study identified a disparity between college students with learning disabilities and their peers without learning disabilities with regard to the difference in mean scores of the LASSI on six of the inventory's scales: Anxiety, Attitude, Concentration, Selecting Main Ideas, Study Aids, and Test Strategies. Each scale will be discussed within the context of current research literature.

Anxiety

The LASSI's Anxiety Scale "assesses the degree to which students worry about school and their academic performance" (Weinstein & Palmer, 2002, p. 4). The current research has found a significant statistical difference between university students with learning disabilities and their counterparts without learning disabilities related to the Anxiety scale. Students with learning disabilities exhibit higher levels of anxiety associated with performance and success in postsecondary education. This result is similar to other studies of postsecondary students with learning disabilities.

Carrol and Iles (2006) compared 16 students with dyslexia with 16 students with no history of learning difficulties in anxiety associated with a timed reading test. Results indicated that college students with dyslexia had anxiety levels well above the levels of their peers without learning difficulties. In applying the LASSI to 122 undergraduate and graduate students, Kovach and Wilgosh (1999) found that "anxiety (ANX) was higher than the norm for the whole group with LD, and higher for females" (¶ 18). Heiman (2006) has speculated that anxiety may stem from students' feelings of lower self-efficacy, and their self-perceived levels of competence and their actual achievements (p. 464). As Wachelka and Katz (1999) observed, "a small amount of anxiety acts as a motivator; it can enhance performance by encouraging the student to try" (p. 192). Anxiety experienced at higher levels can become detrimental to academic performance (Wachelka & Katz).

Attitude

The LASSI's Attitude Scale measures "students' attitudes and interest in college and academic success" (Weinstein & Palmer, 2002, p. 5). It examines their approach to college and academics and how their attitudes help or hinder getting their work done, thus leading to success in college. "Students who score low on this scale may not believe college is relevant or important to them and may need to develop a better understanding of how college and their academic performance relates to their future life goals" (H & H Publishing, 2006, ¶ 1).

Although Kovack and Wilgosh (1999) observed that postsecondary students with learning disabilities were found to have a more positive attitude toward college success compared to their peers, this research did not confirm such a finding. Participants in this study were found to have a less facilitative approach to academics and a less positive attitude towards visualizing the link between college material and its relevance toward their future goals. No evidence was found of a statistical significance between the late and early identification groups related to the LASSI category of Attitude.

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College students' positive attitudes toward college and their academic skills can help facilitate their success (Abreu-Ellis, 2008). However, similar to the current study, Henderson (2001) has found that, in comparison to their peers without disabilities, college students with disabilities were less likely to rank themselves as having a high level of ability. This negative self-perception could have an effect on students' attitudes toward academic material and the ways they approach it. This outcome is also daunting given the fact that there could be other outcomes of success tied to students' attitudes. For instance, Nelson, Dodd, and Smith (1990) surveyed faculty members in order to assess their willingness to accommodate postsecondary students with learning disabilities. Findings indicated that faculty members were willing to accommodate students with learning disabilities, but that "student's attitudes would influence whether or not they would provide him or her accommodations" (p. 188). If college students with disabilities are perceived by faculty as having less commitment to academics than their peers without learning disabilities they may not be afforded the opportunities that otherwise would be extended.

Concentration

The LASSI Concentration Scale "assesses students' ability to direct and maintain their attention on academic tasks" (Weinstein & Palmer, 2002, p. 6). Findings from the current study show that college students with disabilities score less in Concentration than the normed sample for the LASSI.

By nature, students with learning disabilities have a functional limitation regarding processing information. We speculate that the low scores in concentration stem from the challenge in being able to efficiently process information and the frustration and avoidance behaviors that parallel such an experience. "One of the ways college students with LD may compensate for their cognitive difficulties is by relying on metacognition; that is, consciously controlling actions that are too complex to be controlled automatically" (Trainin & Swanson, 2005, p. 261). As such, students may be trained to utilize strategies that help them process material (and especially text-based materials) in a different manner and thus improve concentration.

Trainin and Swanson (2005) studied college students with disabilities and their capacities to "compensate in cognitive processing by relying on metacognitive strategies" (p. 263). They concluded that both grade point average and achievement were related to increased metacognitive learning strategies in students with learning disabilities. Thus, "low scoring students may need to learn to monitor their level of concentration and develop techniques to redirect attention and eliminate interfering thoughts or feelings so that they can be more effective and efficient learners" (H & H Publishing, 2006, ¶5). This may be accomplished by using training techniques such as those based on metacognitive learning strategies.

Selecting Main Ideas

The LASSI's Selecting Main Ideas Scale "assesses students' skill at identifying important information for further study from less important information and supporting details" (Weinstein & Palmer, 2002, p. 5). It analyzes such processing behaviors as whether students can identify the key points in a lecture or decide what is important to underline in a textbook (Weinstein & Palmer). In the current study, findings reveal that college students with learning disabilities had lower mean scores in the Selecting Main Ideas Scale than the normed LASSI sample. Research on information processing may suggest possible explanations for this result.

"Student's attitudes would influence whether or not [faculty] would provide him or her with accommodations."

Research on college students with learning disabilities "indicates that the word attack and word recognition skills that were problematic as children apparently continue to be problematic into adulthood" (Warde, 2005, p. 23). This is highly concerning given that information and evaluations in academia are highly text based. In pursuing a mixed-methods study, comparing college students with learning disabilities to their peers without learning disabilities, Warde asked whether college students with learning disabilities miscue orally read words at the same rate as their peers without learning disabilities and whether the type of text structure influenced the number or quality of miscues for either group. Results from Warde's study indicated that "the college students with learning disabilities produced a significantly greater number of miscues than the college students without learning disabilities" (p. 30) and that "the students with LD produced a significantly higher percentage of Loss-of-Meaning miscues" (p. 30) in which their interpretation of the material had changed the textual meaning of what was being read. This result indicates that students with learning disabilities related to the decoding of written material may struggle to correctly interpret the significance of its meaning due to reading miscues. This could be of relevance in academic performance where students are losing meaning of text-based materials as they read them and misinterpreting the textual meaning of the items.

There are, of course, solutions to this particular issue, but proper identification of the nature of the learning disability is of key importance. "Disability service providers on college campuses are faced with the problem of determining appropriate accommodations for college students with LD. Often these decisions are based on inadequate or outdated assessment results" (Warde, 2005, p. 33). With proper identification of word miscuing, students may be able to take advantage of accommodations such as books on tape, a reader during examinations, or screen-reading software that provides the same outcome, making text-based information accessible. Deacon, Parrila, and Kirby (2006) also suggest that students may be retrained in the way they process text. They claim that, for college students with high functioning dyslexia, "derivational processing skills might permit an avenue of compensation in reading comprehension to surpass phonological difficulties" (p. 110).

Study Aids

The LASSI's Study Aids Scale assesses students' "ability to use or create study aids that support and increase meaningful learning and retention" (Weinstein & Palmer, 2002, p. 12). The current study has found college students with learning disabilities to have better abilities than their peers without learning disabilities in relation to the creation and use of study aids to support their learning and recall.

In their research comparing college students with learning disabilities and attention deficit hyperactivity disorder with their peers without learning disabilities, Reaser, Prevatt, Petscher, and Proctor (2007) found similar results in that "students with LD actually scored higher than ND [Non-Disabled] and ADHD groups on the Study Aids scale" (p. 635). They observed that it is possible that students with learning disabilities may have received accommodations prior to college and were "familiar with seeking out help from support resources such as teachers, counselors, or offices of disability services" (p. 635).

Test Strategies

The LASSI's Test Strategies Scale assesses students' use of both test preparation and test taking strategies. It asks whether students know how to

study for tests in different types of courses and probes student behavior on such test-taking strategies as whether they review their answers to essay questions (Weinstein & Palmer, 2002).

Results from the current study indicated that college students with learning disabilities from this sample scored below the normed sample for the LASSI on the Test Strategies Scale. The Test Strategies Scale was also the only measure in which a significant statistical difference was found between the early learning disability identification group and the late learning disability identification group in this study.

Test-taking skills require students to be able to decode information, remember material, and communicate the material in an organized and coherent manner at time of assessment. Research points to the notion that the development and adaptation of learning strategies that all students need to perform such a process may naturally develop slower for students with learning disabilities (Borkowski & Burke, 1996). Further confounding the issue is the fact that in special education services in K-12 education these strategies are often glossed over or not touched upon at all. For instance, in studying how high-ability students with learning disabilities succeed in postsecondary education, Reis, McGuire, and Neu (2000) have observed that "participants believed that having a learning disability was considered by elementary or secondary school personnel as synonymous with below average ability. They reported that content remediation, rather than instruction in compensatory strategies, was usually provided" (p. 123).

The current study found that individuals who were identified with learning disabilities during their college programs had lower mean scores in the Test Taking Scale on the LASSI than their peers who had been identified in the K-12 education setting. This means that the late-identified group struggled more with test-taking strategies than their peers who were diagnosed earlier in their educational careers. Although Reis, McGuire, and Neu (2000) point to the fact that content remediation takes a primary focus for students identified and receiving special education services in K-12 education, findings of the current research would indicate that early-identified students do come to college with more ample test-taking strategies than their counterparts who have been identified with L.D. in college. If students were provided with even minimal instruction on compensatory strategies during their K-12 educational experiences, then logic would dictate that they would have an advantage over peers who were not identified until college with learning disabilities and had not received previous instruction on compensatory learning strategies. As well, students who were identified after their first year of college would not have been afforded the same opportunities in the form of instruction by a learning strategist as their peers who had transitioned to college with a documented learning disability and thereby had services "transferred" from the high school to the college environment. Early identification then becomes a very important issue for students with learning disabilities to succeed in test-taking at the college level, as supported by findings of this study.

Limitations

The small sample size (N = 45) is a limitation of this study. However, access to the participant population (college students with diagnosed learning disabilities) is limited due to confidentiality and registration with Disability Offices. The indices of students with disabilities in post-secondary education are on the rise, but their numbers are still much lower than the general population. Other researchers have used similar sample sizes with significant results (Reaser, Prevatt, Petscher, & Proctor, 2007).

Suggestions for Active Response

Research on learning disabilities has indicated "at the college level, the combination of less academic support and the need to exert greater independence often results in frustration and failure for students who had previously experienced success in school" (Foley, 2006, p. 641). As such, research has become an important factor in developing effective procedures for assisting the academic learning of students with learning disabilities (Rath & Royer, 2002, p. 253). In recent years, based in large part on research findings, there has been a significant increase in the variety and availability of services to postsecondary students with learning disabilities.

Results of this study indicate significant differences between the scores of students with L.D. and the normed sample in six of the eight LASSI Scales. These findings reflect a strong need to address and improve the learning strategies of college students with learning disabilities. Virtually every college and university in Ontario has a Learning Strategist and an Assistive Technologist on staff to assist students with diagnosed learning disabilities. In addition, many institutions offer comprehensive transition support programs, specifically designed to assist 1st-year students who have learning disabilities with the transition from high school to higher education. Other supports include: study skills training, test anxiety management workshops, individual counseling, and self-advocacy training, all intended to promote postsecondary success for students with learning disabilities. Similar kinds of supports and services are available at postsecondary institutions across North America to the benefit of many thousands of students every year. However, the fact that such supports remain largely unavailable earlier in Canadian students' academic careers is of concern.

Although early identification has been noted as a critical issue in providing appropriate services to students with disabilities (Learning Disabilities Association of Canada, 2007b), it is also the case that early identification without appropriate follow-up falls far short of providing the skills these students need to be successful in higher education. The study by Reis, McGuire, and Neu (2000) suggests that early identification of a learning disability usually results in content remediation rather than skills acquisition, and may in fact lead to the misperception by school personnel that students so identified have below average ability. In other words, early identification may in fact create additional attitudinal barriers to academic success. We would suggest that a more appropriate response to early identification of a learning disability (at elementary and secondary levels) should be:

- Provision of study skills and learning strategies training, with a focus on development of test-taking strategies, management of test anxiety, identification of main ideas in lecture and text, and specific metacognitive training determined by each student's unique learning profile. Early training in these areas could contribute to the development of active independent learners, and indirectly address issues related to anxiety, attitude, and self-esteem.
- Instruction in the use of appropriate technology as supported by assessment (i.e., text-to-voice software, voice-to-text software, semantic mapping and organizing software, etc.)
- Individual education related to each student's assessment, diagnosis, and recommendations for accommodation, as a means for promoting self-awareness, self-understanding, and appropriate self-advocacy.

Early identification may in fact create additional attitudinal barriers to academic success.

- Provision by high schools of meaningful support programs for students with learning disabilities who are transitioning to college/university.

The current wait-to-fail approach in which educators wait for a gap in achievement to be observed through progression of academic failure is incongruent with the potential for long-term success of students with learning disabilities. Recently a new model of intervention has been introduced that may offer a potential solution. Response to Intervention (RTI) is a multilevel system in which intensive instruction is monitored and students' responses to interventions determine if they require additional support (Fuchs & Fuchs, 2005). In this manner all students are potential recipients of accommodations, independent of diagnosis of disability. This marks a progressive move toward both inclusion and individualized education which facilitates both early identification and support for students with learning disabilities. The problem inherent in the RTI approach is that the requirements for assessment and diagnosis of learning disabilities become much more stringent at the postsecondary level. Therefore early accommodations available to students in a response to intervention approach may not be available at all under more stringent postsecondary guidelines. In North America, in many ways, there is a disconnect between the secondary and postsecondary systems of education, particularly as they relate to the identification and accommodation of students with learning disabilities. The unfortunate result is that not only are students arriving on campus without the requisite skills for academic success, but they are now expected to find their way in a system where the rules seem to have changed.

More must be done to bridge the gap and to smooth the transition from high-school to college/university for these students. This may not be as daunting a challenge as it seems, because the solution may simply require the reallocation and redistribution of funding and resources that already exist at the postsecondary level. A uniform standard for defining, identifying, and diagnosing learning disabilities would be a start. Another option to ease the transition to college might be to provide a summer bridge program for students with learning disabilities similar to those for developmental education students.

Further, providing earlier access to the funding and resources that currently become available only at a postsecondary level would increase the likelihood of success for students with learning disabilities in Ontario. All high school students who are on track for postsecondary education should have access to supports such as funding for psycho-educational assessment, learning strategies instruction, funding for appropriate technology, and education about their learning disability at a level which is currently only available to them when they arrive at university.

Conclusion

Although many of the suggested supports are readily available at most postsecondary institutions in North America, they may come too late for many students who may have been identified/diagnosed years earlier but were unable to access appropriate and timely accommodations, information, and support. Failure to provide students with appropriate support and instruction at time of identification can potentially allow for the accumulation of additional emotional "baggage" related to the disability, exposing students to additional experience with academic failure, and promote the potentially destructive development of learned helplessness and passivity regarding learning/study behaviors.

We would also suggest that despite the obvious value and necessity of such services and supports at a postsecondary level, students accessing them for the very first time in university can least afford the additional curricular demands

during what is already a challenging transition. It takes time, effort, and energy for students to learn about the techniques, strategies, and technological supports to which they are entitled on the basis of their learning disability, particularly in the face of an already demanding curriculum. It would make far greater sense for students to begin their postsecondary academic careers having already learned this skill set prior to their arrival at university, fully prepared to learn at their potential. This process is, of course, only possible with early identification/diagnosis of the learning disability: however, we would further suggest that an immediate and proactive response to disability diagnosis is critical to the development of active, productive learners and successful postsecondary graduates.

Although there is clearly an acknowledgement by federal and provincial regulators of the need for supplemental resources and supports for students with learning disabilities, the timing of their provision and their current availability primarily at a postsecondary level needs to be re-assessed. High school students with learning disabilities who are on a track to postsecondary education should be supported in making a successful transition by ensuring that they have earlier, timelier access to the kind of funding, supports, and accommodations that await them in college and university. There are many bright young high school students with learning disabilities who do not see postsecondary education as a realistic goal, but who might see things differently if they were simply provided with the tools they need to succeed in a more timely way. Early identification of the learning disability, coupled with appropriate and timely follow-up emerge as the key elements in propelling these students toward academic success.

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For Your Information

June

10–13, 2009 – National Student Affairs Administrators in Higher Education's (NASPA) International Assessment and Retention Conference, "Taking the Next Step: Shared Ownership of Assessment & Retention in Higher Education," will be held at the Marriott New Orleans, LA. For more information visit http://www.assessconf.net/

14–17, 2009 – The League for Innovation in the Community College's 2009 Learning College Summit will be held at the Arizona Biltmore Hotel and Spa, Phoenix, AZ. For more information visit http://www.league.org

23–27, 2009 – The Washington Center's Learning Communities National Summer Institute will be held at the Evergreen State College, Olympia WA. For more information visit http://www.evergreen.edu/washcenter

24–July 27, 2009 – Kellogg Institute for the Training and Certification of Developmental Educators will be held at Appalachian State University, Boone, NC. For more information, see ad on page 33, or visit http://www.ncde.appstate.edu/kellogg.htm

July

12–16, 2009 – National College Learning Center Association's (NCLCA) Summer Institute will be hosted by North Central College, Naperville, IL. For more information visit http://nclca.org/institute.htm

12-15. 2009 – The Association for Information Communications Technology Professionals in Higher Education's (ACUTA) 2009 ACUTA Summit on Unified Communications and Collaboration will be held at the Marriott City Center, Denver, CO. For more information visit http://www.acuta.org/home.cfm

20–23, 2009 – The 22nd Annual International Conference on the First Year Experience will be held at The Queen Elizabeth Hotel, Montreal, Quebec, Canada. For more information visit http://www.sc.edu/fye/events/international/index.html

21 -23, 2009 – Noel-Levitz's The National Conference on Student Recruitment, Marketing, and Retention will be held at the San Antonio Marriott Rivercenter, San Antonio, TX. For more information visit www.noellevitz.com

26–31, 2009 – Technology Institute for Developmental Educators' (TIDE) 11th Annual Institute, cosponsored by Texas State University at San Marcos, CRLA, and NADE, will be held in San Marco, TX. For more information visit http://www.ci.txstate.edu/tide/tidehome.htm

August

2–4, 17–19, and September 13-15, 2009 – A series of the University of Missouri–Kansas City's (UMKC) Supplemental Instruction Training Workshops will be offered on the UMKC campus, Kansas City, MO. For more information, see ad on page 43, or visit http://www.umkc.edu/si

September

23–25, 2009 – Arkansas Association for Developmental Education's (ArkADE) Annual Fall Conference, "Pearls of Wisdom," will be held at the Crowne Plaza Hotel in Little Rock, AR. For more information, see ad on page 27, or visit http://www.clt.astate.edu/ArKade/

30–October 3, 2009 – National Academic Advising Association's (NACADA) Annual Conference, "Academic Advising: Deep in the Heart of Student Success" will be held in the San Antonio Convention Center and The Grand Hyatt, San Antonio, TX. For more information visit http://www.nacada.ksu.edu/AnnualConf/2009/index.htm

October

1–2, 2009 – National College Learning Center Association's (NCLCA) Annual Conference "Mountaintop Experiences in Learning Assistance: What are they and How do we reach them?" will be held at the Marriott Denver West in Golden, CO. For more information visit http://nclca.org/annualconference.htm

11-14, 2009 – The League for Innovation's 25th Annual Conference on Information Technology, C.I.T. 2009, will be held at the Cobo Conference Center/Exhibition Center, Detroit, MI. For more information visit www.league.org/2009cit/reg

22–25, 2009 – College Reading and Learning Association's (CRLA) 42nd Annual Conference, "Foundations for Success in Times of Change" will be held at the Richmond Marriott, Richmond VA. For more information, see ad on page 7, or visit www.crla.net