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Autism Spectrum Disorder Coursework for Teachers and Teacher-aides: An Investigation of Courses Offered in Queensland, Australia

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Abstract: The content and structure of pre-service and teacher-aide programs has major implications for training, management, support and deployment of teachers and teacher-aides in mainstream schools working with students who have ASD. Data pertaining to course content and structure were collected from university and teacher-aide training websites, program enrolment guides, and through direct contact with institutions in Queensland, Australia. 101 education programs were narrowed down to 45 in early-childhood/primary education, and 8 online teacher-aide training programs. Findings indicate the urgent need for academics in institutions to begin working towards redesigning programs that deliver best practices in ASD for pre-service educators.

Introduction

ASD is a developmental disability that can produce considerable social, communication and behavioural difficulties (CDC, 2012). People diagnosed with ASD range from those who are considered gifted, to others who have an intellectual disability (ID) which may impact their learning, thinking and problem-solving as students in school. Other behavioural, developmental, psychiatric and medical diagnoses can co-occur with ASD, such as ID, epilepsy, and attention-deficit hyperactivity disorder (ADHD) (Jacobson, Mulick, & Green, 1998; Van Steijn et al., 2012). A sense of urgency exists among educators and parents to ensure students with Autism Spectrum Disorder (ASD) are provided an appropriate education. This urgency is due to increasing numbers of students who have ASD attending mainstream schools, poor learning outcomes, an increase in lawsuits, and, an ever-growing knowledgebase of strategies that are deemed effective when working with this particular cohort (Robbins, 2010). Furthermore, increasing legislative demands emphasising teacher quality have positioned educators working with students who have ASD under intense scrutiny. Effective methods of educating both pre-service teachers and teacher-aides in the field of autism need to be recognised and implemented in order to better support them in addressing the educational needs of this growing population.

The latest quadrennial data collected by the Australian Bureau of Statistics (ABS), through the Survey of Disability, Ageing and Carers (SDAC) found that the number of people documented to have ASD in Australia increased 79% between 2009-2012 (ABS, 2012). This equates to at least 1 in 63 Australian school children having obtained a formal autism diagnosis. In considering how these children are progressing through education, further examination of the ABS data uncovered that of the children who have ASD and attend mainstream schools in Australia, 86% reported difficulties in areas such as learning,

communicating and socialising (ABS, 2012). This increased prevalence and indications of major complications with schooling has generated significant pressure on education departments, creating a strong need for educators to be better qualified to teach students who have ASD.

Beginning teachers and teacher-aides of students who have ASD need a foundation of essential educational skills in the area of autism. Researchers have stressed the need for educator training as a priority to be developed in autism policy, suggesting that measures taken by state and federal governments are discouraging when considering the increased prevalence of ASD (Giangreco & Doyle, 2007; Hart & More, 2013). Without concentrated effort on improving pre-service teacher and teacher-aide training, both groups of professionals could continue to be inadequately prepared to craft and provide developmentally appropriate learning opportunities for students who have ASD and many of these students will fail to progress. Developing carefully considered content for both pre-service teachers and teacher-aides, including an improvement in educator performance should result in better outcomes for this particular group of students.

Literature Review

Within the modern classroom, teachers often are supported by paraprofessionals such as teacher-aides. Teacher-aides play a vital role towards educating students, with a high proportion of students who have ASD receiving ongoing support from those in this role throughout their education (Alston & Kilham, 2004). Teacher-aides offer consistency when a student who has ASD changes from one teacher to another, which is important for children who require routine and predictability (Alston & Kilham, 2004). Often teacher-aides will have a more positive attitude towards students who have ASD in comparison with other staff, as many teachers have expressed anxiety regarding this particular cohort (Emam & Farrell, 2009). Teacher-aides have recognised in recent years their need for more training (Blatchford, Bassett, Brown, Martin, Russell & Webster, 2009), and focused training has been a pivotal area of this discussion (Groome & Rose, 2005). There is certainly a disparity between the training received by teacher-aides and the workload expected of them (Russell, Blatchford, Bassett, Brown & Martin, 2005). Teacher-aides who work with students who have ASD often begin their career with minimal or no training about ASD (Glashan, MacKay & Grieve, 2004). Merely utilising a teacher-aide without training or prior experience in working with students who have ASD is unsuitable if these students require specific support to reach their full potential (Symes & Humphrey, 2011).

There is a significant quantitative and qualitative international research base that has examined the roles, efficacy, and the factors that impact the performance of teacher-aides working in inclusive classrooms (e.g. Ashbaker & Morgan, 2012; Cajkler & Tennant 2009; Farrell, Alborz, Howes & Pearson, 2010; Giangreco, Suter, & Doyle, 2010; Saddler, 2014; Sharma & Salend, 2016). These studies imply that blurred professional roles, insufficient communication and opportunities for collaboration and training for teacher-aides and teachers results in teacher-aides managing substantial educational roles that unintentionally destabilise the professional responsibility of teachers and the inclusion of students with disabilities. Rather than assuming major instructional roles, teacher-aides should perform complementary roles and be well prepared and supervised.

Due to the increased prevalence of students identified as having ASD, it is more likely that pre-service educators will work with students who have ASD both in the classroom and wider community (Hart & Malian, 2013; Hart & More, 2013). Both teachers and teacher-aides need to have a comprehensive knowledge of ASD, often by simultaneously managing

overt behaviours and supporting access to all aspects of the curriculum (Hart & Whalon, 2012). However, studies overseas have indicated that both universities and teacher-aide training facilities have been ineffectual in designing concentrated, first-rate courses and school-based practicum experiences as a necessary component of both pre-service teacher and teacher-aide training qualifications (Masterson, Dimitriou, Turko, & McPartland, 2012; Shyman, 2012; West, Jones, Chambers, & Whitehurst, 2011). A key element in this ineffectiveness has been an absence of widespread use of evidence-based practices to inform educators generally (Hempenstall, 2003), and those who will be teaching students who have ASD specifically (NRC, 2001), of ASD etiology, its manifestations in relation to learning, and, best practices in providing opportunities to learn.

In conjunction with a limited understanding of the disorder lies the issue of an educator's inability to identify the initial warning signs and features related to ASD (Travers, Tincani, & Krezmien, 2011). Early intervention for children who have ASD is significant because it is often connected to better educational results and a decreased severity level of the ASD diagnosis over time (Hart & More, 2013). This in itself highlights the need to develop better training for pre-service educators in order to expand knowledge and awareness of ASD across cultural contexts. In regard to achieving this challenge, a key concern is the limited time instructors have within universities and teacher-aide training facilities to cover course content associated with inclusion and other disabilities (Kennedy, Hart & Kellems, 2011).

Several studies have examined effective and efficient means of training teacher-aides (e.g. Brock & Carter, 2013; Rispoli, Neely, Lang, & Ganz, 2011; Walker & Smith, 2015). Training teacher-aides to utilise instructional strategies with the specific needs of individual students rather than choosing educational methods developed exclusively on a student's disability category is recommended (Brock & Carter, 2013). They also found that teacher-aides who obtain sufficient training and provision may be able to apply instructional and support strategies correctly to improve educational outcomes for students who have ASD. Training protocols consisting of written and verbal descriptions, demonstrating, such as video demonstrations and role playing may also be effective in training teacher-aides to successfully implement appropriate interventions (Rispoli, Neely, Lang, Ganz, 2011). The value of teacher-aide training as a means of improving skill, behaviour or attitude for both the teacher-aide and student with a disability was highlighted by Walker & Smith (2015). It was also noted that the continued reliance of teacher-aides in inclusive settings and their reported concern in completing appropriate inclusion training should be examined in future research and included by schools as a priority when offering professional development opportunities.

Despite a need for evidence-based guidance in better praxis for preparing the educational service, few papers exist concerning how to conceptualise and organise content of ASD courses for undergraduate studies in education. Currently, many universities abroad offer a certificate in autism at the graduate level, particularly in education (Masterson et al., 2012) and conceivably, similar programs could be developed for undergraduates and those in teacher-aide training programs. The authors found three papers which highlight ways that should be included for pre-service programs to bridge the gap in ASD knowledge for teachers and teacher-aides in training.

One study (Masterson et al. 2012) concluded that an introductory course in ASD is of paramount importance for the field, and that it should be followed by a sequence of intensive courses. The proposed structure is to have an introductory outline of topics in ASD that are followed by intensive courses in Applied Behaviour Analysis (ABA), trial-supported treatments, and effective communication strategies. Masterson et al. (2012) stated that the main intention behind offering an introductory course in ASD is to deliver a concrete summary of the many facets of ASD, such as its biological, etiological, theoretical, diagnostic, assessment and treatment aspects. "Due to the increasing prevalence of ASD,

there is a crucial need for both bachelor and graduate level teachers for these children” (Masterson et al., 2012, p. 2646). It was suggested that to achieve this type of course design would not only sanction duplicate courses at other universities, but would also create standards to ensure excellence in teacher and teacher-aide training.

According to Hart and More (2013), there are many reasons for courses in ASD being difficult to include in pre-service educator studies. These difficulties include limited instructional time within existing pre-service education programs, rising prevalence rates, limited access that many diverse families experience in relation to early-childhood programming, restricted University budgets, variable attendance among students in instructional programs, and, competition for Faculty workload. In order to address these issues, Hart and More (2013) developed a research-based and technology-inspired instructional package, designed to enrich programs without jeopardising the scope and sequence of courses currently offered to pre-service educators. Their design had a marginal effect on institution resources, class attendance by students, and the workload of instructors. It incorporated use of narrated PowerPoints that had been developed by academics with expertise in ASD, with up-to-date key text, audio and visuals as an alternative to delivering information that may go otherwise unnoticed in inclusive-education based and/or generic courses based on disabilities. Further, they recommended that a Professional Development (PD) system be developed with education departments who oversee professional development in ASD. The advantage of using a PD system is the convenience of regular emails, video conferencing, and/or live chat rooms with experts to help and guide educators who may value support as they practise the different strategies they are learning.

Shyman (2012) developed a blueprint for pre-service education programs. Based on available research, the paper outlined major areas pertaining to ASD that should be included throughout pre-service studies. He contended that pre-service education programs with key components in ASD must have practical, hands-on and theoretical information with a commitment to the concrete issues in the field of educating students who have ASD (Shyman, 2012). Such a program essentially would have a curriculum that facilitates studying through practice, meaning, community and identity, and that includes opportunity to ascertain authentic and workable professional knowledge through direct encounters with experienced professionals who have expertise in the field (Lieberman & Pointer Mace, 2008). Shyman (2012) outlined nine areas of ASD that should be taught to pre-service educators as the core of such opportunity. The topics he provided for these nine areas are: *Characteristics of Individuals with ASD; Understanding of Current Research and Evidence-Based Practices in ASD; Multidisciplinary Approaches to Methodologies in ASD; Behaviourally-based Approaches; Emotional-based Approaches; Communication-based Approaches; Technology-based Approaches; Sensory-based Approaches; and Medically-based Approaches* (Shyman, 2012). For those preparing to work effectively with this cohort, these topics are an instalment in framing both a broad introductory understanding of ASD and a sense of need for adaptive use of that understanding as a knowledge base for the skilful, functional and competent enactment of their looming roles as educators with their students who have ASD.

The overview provided in the preceding review presents a vision of need for greater awareness of just what is happening in current provision of specific training in pre-service teacher and teacher-aide training programs in relation to ASD. Accordingly, research as reported was developed to address the following research question: What insights can be gained pertaining to ASD courses currently offered to pre-service teacher and teacher-aide training programs in QLD, Australia?

Method

For the purpose of this paper, both pre-service teacher education and teacher-aide training programs available in Queensland, Australia were identified. Data were collected by:

- a) Collating a table of pre-service education programs offered in Queensland as listed on the Queensland Tertiary Admissions Centre (QTAC) website, and by gathering a list of approved teacher-aide programs offered online. The QTAC website lists every degree program offered in the state of QLD, Australia.
- b) A course-design template from a national university in Australia was selected to use as a guide to analyse what was covered in each course from each Education program at the different universities. Our first step in its application was to examine the name of courses within each program for any indication of topic areas related to Inclusion, and/or ASD. We included 58 courses where this occurred. For those where it did not, we then checked the objectives, anticipated outcomes, curriculum content, assessment and the alignments of these components. An example of the template used can be found in Figure 1 below.
- c) The scope of the current undertaking was so large that we began with all university programs in QLD, however focused on Early-childhood and Primary pre-service programs only. This will be discussed further in the limitations of the study.
- d) Four colleagues were involved in interrater reliability and this provided a 100% agreed outcome. Additionally, three academics who currently are involved in teaching inclusion courses at university screened programs to be included in the current study to agree on the inclusion of early-childhood and primary education programs. Each of the authors rated the courses on a Yes/No/Maybe scale. In cases assigned to the Maybe classification subsequent discussion resolved the assignment to either Yes or No categories. There were no instances of the same course rated as “Yes” or as “No” by one or more raters. This initial allocation and resolution process provided a 100% agreed outcome.
- e) In the 10 cases where evidence that occurred from application of the national university course template was inconclusive, requests were sent to the university for clarification. Academics who were teaching the programs for teacher-aides at different institutions identified courses on offer to become teacher-aides in QLD.

An overview of programs found using these five steps is shown below for preservice early-education and primary school teachers (Table 1) and teacher-aides (Table 2).

Number of Universities	Number of Programs Analysed	Number of Courses Analysed	Data Collection Methods	Number of Inclusion/ Disability Courses	Number of programs offering ASD-specific Courses
10	45	295	Analysis of program-enrolment guides and contact with institutions	51	1

Table 1: Pre-Service Teacher Education Course Analysis from Universities in Queensland, Australia

Number of Institutions	Number of Programs Analysed	Number of Courses Analysed	Data Collection Methods	Number of Inclusion/ Disability Courses	Number of programs offering ASD-specific Courses
8	8	158	Analysis of program-enrolment guides and contact with institutions	17	0

Table 2: Teacher-Aide Training Course Analysis from 8 Institutions in Queensland, Australia

UNIT CODE UNIT TITLE CREDIT POINTS DISCIPLINE CLUSTER (EDUCATION) PRE-REQUISITES: RELATIONSHIP TO OTHER UNITS UNIT DESCRIPTION LEARNING OUTCOMES GRADUATE ATTRIBUTES CONTENT TEACHING AND LEARNING STRATEGIES ASSESSMENT PROCEDURES		
Brief Description of Assessment Tasks	Learning Outcome/s Assessed	Graduate Attributes
Common Assessment Task		
Other Assessment Tasks may include		
REFERENCES		

Figure 1: Course Design Template Example

Results

Data pertaining to course content and structure were collected from university and teacher-aide training websites, course enrolment guides, and contacting institutions in Queensland, Australia. 101 education programs were narrowed down to 45 Early-Childhood (EC)/Primary (P) education programs currently offered in Queensland. University names have been removed as the purpose of this study was not to highlight which institution is producing the most ASD-related content, rather to demonstrate the inconsistencies between each university and the limited ASD-courses that are offered.

	Program Name	Courses (Disability/Inclusion)	Year of study course/s offered	Course Description Summary
University A	1) B.Ed. (EC&P)	4	3 rd & 4 th	Course topics range from creating inclusive environments, family studies and disabilities and catering for diversity in the classroom.
	2) B.Ed. (P)	4	3 rd & 4 th	
	3) B.Ed. (P: Indigenous Studies)	3	2 nd & 3 rd	
	4) M.Teach.	1	2 nd	
University B	1) B. Learning Management (EC)	1	3 rd	How to manage diversity in the classroom.
	2) B. Learning Management (P)	1	3 rd	
	3) GradDip. Learning and Teaching (P)	0		
University C	1) B.Ed. (P)	2	3 rd & 4 th	Inclusive philosophy and practice and meeting the needs of diverse learners.
	2) B.Ed. (Middle Years)	2	3 rd & 4 th	
	3) GradDip. Ed. (P)	0		
University D	1) B.Ed. (P)	2 + 1 Elective	1 st & 3 rd	Adjusting and valuing learner diversity, and the elective is based on students with special needs. The M.Teach course relates to pedagogy for inclusive learning.
	2) B. Child & Family Studies + B. Ed. (P)	2 + 1 Elective	1 st & 3 rd	
	3) M.Teach	2	2 nd	
	4) GradDip. Ed. (P)	0		
	5) GradDip. Ed. (EC)	0		
University E	1) B.Ed. (EC)	1	3 rd	Inclusive Education for students with Special Needs.
	2) B.Ed. (P)	1	3 rd	
	3) B.Ed. (Primary Special Needs)	8+	1 st – 4 th	
	4) B.Ed. (Middle Years)	1	3 rd	
	5) B.A. + B.Ed. (P)	1	3 rd	
	6) B. Languages + B.Ed. (P)	1	3 rd	
	7) GradDip. Ed. (P)	0		
	8) GradDip. Ed. (Years 1-9)	0		
University F	1) B.Ed. (EC)	1	2 nd	Inclusion in early childhood settings and inclusive education studies that focus on disabilities, learning difficulties and inclusion.
	2) B.Ed. (Pre-service EC)	1	2 nd	
	3) B.Ed. (P)	1	4 th	
	4) B.A. + B.Ed. (P)	1	4 th	

	5) B.ASc + B.Ed. (P)	1	4 th	
	6) B.A. + B.Ed (EC)	1	4 th	
	7) B. A (LOTE) + B. Ed. (EC)	1	4 th	
	8) GradDip. Ed. (Early Years)	0		
	9) GradDip. Ed. (Middle Years)	0		
	10) GradDip. Ed. (P)	0		
University G	1) B.Ed. (EC)	1	1 st	Supporting learners with disabilities.
University H	1) B.Ed. (P)	1	3 rd	Diversity and inclusive education, and teaching for diversity in the classroom.
	2) B.Ed. (Middle Years)	1	2 nd	
	3) GradDip. Ed. (Middle Years)	0		
University I	1) B.Ed. (EC)	1	2 nd	Diversity and pedagogy, as well as educating for diversity. Courses covered in major: Introduction to special education, managing supportive learning environments, learning difficulties in literacy and numeracy, Autism Spectrum Disorders, teaching students with high support needs, and differentiating the curriculum.
	2) B.Ed. (P)	1	3 rd	
	<i>Students also have the option to choose 'Special Education' as a Major in the BEd course at this University.</i>	6 (one of which is a 9-week course focused on ASD)	All 6 courses offered in 3 rd	
	3) GradDip. Learn. & Teach. (P)	1	1 st	
	4) GradDip. Learn. & Teach. (Middle Years)	1	1 st	
University J	1) B.Ed. (P)	2	3 rd & 4 th	Diversity in the classroom and teaching exceptional children.
	2) B.Ed. (EC)	2	3 rd & 4 th	
	3) GradDip. Ed. (P)	0		
	4) GradDip. Ed. (Prep-Year 3)	0		

Table 3: ASD course-content for pre-service educators currently being offered by universities in Queensland, Australia

Previous studies (Masterson et al., 2012; National Professional Development Center on ASD, 2008; National Research Council, 2001; Shyman, 2012; West et al., 2011; Volkmar, 2007) have highlighted the knowledge that mainstream educators require in order to work with students who have ASD. We developed the following table to outline courses pertaining to ASD that should be included in pre-service educator programs globally, and how this can be done within the context of Australian universities. An incidental outcome of its creation is that it highlights the limited information and knowledge that currently is provided as essential coursework and practical experience to pre-service educators in Queensland, Australia.

Year of Study	Course Topic	Course Content	Course Purpose	Course Delivery
Second Year (Second Semester)	1. Understanding ASD: Knowledge of the Disorder	Foundations of ASD; including its history, models and theories which have developed, laws and policies, definitions and trends in practice, assessment of ASD.	As a broad introduction to ASD, this course should focus on the foundational information pertaining to ASD where pre-service educators receive the most current available research.	In-person and Online
Third Year (First Semester)	2. Understanding ASD: Characteristics	Developmental characteristics associated with ASD, medical issues, communication issues with speech and language acquisition, behavioural difficulties, factors which impact learning. Multidisciplinary perspectives should be covered from education, psychology, medical fields etc.	This course should focus on the characteristics of ASD by understanding the broad ranges of the spectrum that can be present. Students should complete a practicum/field experience where written reports could be made about experiences with various children who have ASD.	In-person, online and practicum experience
Third Year (First Semester)	3. Supportive Learning Environments and ASD	An overview of instructional strategies which promote positive behaviour and reduce intrusive/negative behaviours, curriculum modifications, evidence-based practices, classroom management, teacher attitude and being realistic with expectations, transitions between activities and promoting inclusion.	As no single strategy will work for every child with ASD, the purpose of this course is to present a widespread collection of available strategies, where pre-service educators can assess how well each strategy is established with solid research evidence.	In-person and online
Third Year (Second Semester)	4. Supportive Learning Environments and ASD 2	This course should be an extension of content covered in semester 1. It should focus on language enhancement, with ways to assist with miscommunication, instructional planning and using technology (such as iPad apps and websites), the role of teacher-aides, modifying and selecting appropriate content for a child who has ASD.	This course is needed for pre-service educators due to communication and language barriers often being a significant concern for people who have ASD. Coursework could comprise of the development of usual/expected language for different ages, and how this compares to the hypothetical differences of language development for people who have ASD. Another key component should be technology advancements for educators to use, covering video modelling, apps for tablets and interactive whiteboard applications.	In-person and online
Fourth Year (First Semester)	5. Ethical Practice and the student with ASD	How to professionally collaborate within a school to generate the best outcomes for children with ASD should be the purpose of this course. It should have a focus on working with people who have biases towards ASD, professional development opportunities, working effectively with teacher-aides, parents, and external professionals. Students should also complete a practicum/field-based component to gain first-hand experience of collaborating with a range of people in a professional sense.	Course content combined with practicum experiences will enrich learning outcomes where pre-service educators can reflect through class discussions and assignments (i.e. presentations, research papers and reflective journals).	In-person, online and practicum experience

Table 4: ASD Course Content for Pre-service Educators Based on Available Research

What is currently being offered to teacher-aid trainees undertaking a Certificate 3 in educational support is presented below. Whilst this certificate is not compulsory for a person to be employed as a teacher-aid in Queensland, it is needed (Education Queensland, 2014). What is covered in this particular qualification does highlight several issues. Given that many teacher-aides work with students who have ASD (Alston & Kilham, 2004), it is concerning to see that while in training they are not taught anything specifically related to ASD. There appears to be more consistency in course titles and content across the eight training institutions for teacher-aides in comparison with the university programs. The distinction is in what an institution labels as compulsory or elective. The former underscores greater importance and essential contact. Where electives in ASD studies are not taken, teacher-aides will receive training which is only minimal in scope and general in focus – typically on “disabilities”. Some may receive none at all. As inclusivity is the norm in mainstream schools in Queensland, and the prevalence rates of ASD continue to rise, more teachers and more teacher-aides will encounter more students with ASD. Clearly, an overhaul of what currently exists as preparation is needed urgently if these encounters are to be evidence-informed, truly inclusive and productive for child learners in their learning, communication and social development.

Teacher-Aide Qualification	Institution	Programs Offered	Course Names	Compulsory (C) or Elective (E) Course	Course Description
All of the institutions analysed offer the <i>Certificate 3 in Education Support</i>	A	2	1. Support students with additional needs in the classroom environment 2. Support learning for students with disabilities in a classroom environment	C E	1. Supporting students with additional needs/diversity: This course teaches the skills and knowledge required by a teacher-aid to support students with additional needs in classrooms where there are students with a mix of abilities and needs. 2. Support learning for students with disabilities in a classroom environment: This course describes the skills and knowledge required as an introduction to working with students who have a recognised disability.
	B	2	AS ABOVE	Both C	
	C	2	1. Work with diversity in the education environment 2. Support learning for disabilities in the classroom environment	C E	
	D	2	AS ABOVE	Both C	
	E	1	1. Work effectively with people with a disability	C	
	F	2	1. Support students with additional needs in the classroom environment 2. Facilitate learning for students with disabilities	C E	
	G	2	1. AS ABOVE	Both C	
	H	2	1. Support students with additional needs in the classroom environment 2. Facilitate learning for students with disabilities	C E	

Table 5: ASD course-content currently being offered by institutions for teacher-aides in Queensland, Australia

Discussion

Generic Coursework vs Specific Coursework

Whilst all ten universities listed in Table 3 offer courses relating to *inclusivity* and *disability*, only one addresses ASD specifically. This particular institution has a nine-week course on ASD as one of six courses constituting a major in Special Education. However, students need to wait until their third year of study to enrol in these six courses and no practicum component is attached to them, meaning students do not have the practical and hands-on experience to link with theoretical information that Shyman (2012) suggested as essential. More generally, each university appears to be addressing the phenomenon of ASD within the generic disability/inclusion courses offered, however, to what depth remains unidentified. Seven of the 10 universities were presenting courses in the creation of '*inclusive environments*' with only one offering courses of study specifically related to the needs of students with ASD. A similar trend exists with '*diversity*', where eight of the 10 universities offer courses dealing with diversity, but only one of these explicitly focuses on ASD. Of the 10 universities surveyed, and of the 51 courses available across their campuses, only one institution was presenting courses in the '*high support and differentiated curriculum area*' specifically relating to students with ASD.

Given these findings, it is not difficult to see why so many in the profession have little or no knowledge of what to do about the complexities of teaching students with ASD. The pressing need for ASD-specific courses to become compulsory for pre-service educators was outlined in the literature review. However, the findings from the 10 universities in Queensland show that ASD information is presented in generic topic areas, and often in elective courses rather than compulsory core studies. An understanding and an appreciation of both human *diversity* and *inclusion* not only are essential components of an equitable education system, but also form the foundation for responsible citizenship. Teachers for decades have welcomed children of all races, religions and cultures, and with the support of advisory teachers, have been effective in including such diversity within their classrooms. However, when the terms "diversity" and "inclusion" are applied to students on the autism spectrum, a vastly expanded understanding of the terms and a specific set of skills are required.

Educators should not be expected to enter the profession without being trained with the necessary skills and knowledge to enable them to offer a fully equitable education for all students. There is evidently a strong need for the development of specific ASD-focused courses to fill this void. Having one or two teachers trained in the complexities of ASD at any one school is no longer a sufficient contingency for immediate and long-term management of equity and excellence - the first of the goals from the Melbourne Declaration on the Educational Goals for Young Australians (2008). Nor is attendance at a one-day, one-off course adequate preparation for teachers of students who have ASD.

ASD-based courses for universities and teacher-aide training institutions to build upon and begin using within pre-service educator training programs are shown in Table 4. Affordability is needed in teaching pre-service educators about the myriad of facets related to ASD, evidenced-based supports that can be used within the classroom, and, opportunities to work one-to-one with students who have ASD (Thomson et al., 2009). The putative courses of study in Table 4 ostensibly should deliver such affordability much better than the current provision outlined in earlier tables. Certainly, this potential needs to be measured and checked for its fidelity in delivery and for outcomes it achieves. Assessing students' prior knowledge and what they know after completing the courses, obtaining their ratings of their practicum experiences and those of their supervisors, assignment results data, and course evaluations they make are quantifiable ways in which to assess the courses immediate impact (Masterson et al., 2012). However, data are also needed both to indicate the portability and

effectiveness of such outcomes as these students transition into professional practice and as the basis for an action learning approach to maintaining and strengthening the affordability of initial learning.

The Importance of Teacher-Aide Training

The literature reviewed here has highlighted the context of the professional training dilemma in that teacher-aides are often designated to assist students with behavioural, emotional and social difficulties, in addition to supporting the classroom teacher with management of student behaviour. The diversity of students within current, inclusive classrooms can present a myriad of learning difficulties and disabilities, and members of this collection of students often work in one-to-one situations or within small groups with teacher-aides (Groom & Rose, 2005). Several studies have found that qualifications held by teacher-aides vary considerably, that few aides are university-educated and that many are employed with no training and experience in education or special education (Balshaw & Farrell, 2002; French, 2001; Giangreco & Doyle, 2007; Giangreco, Broer & Edelman, 2002; Riggs & Mueller, 2001). This literature foreshadows a solution in addressing this dilemma that rests in definitive action in recognising the significance and breadth of need for more and better focus on ASD in the preparation, deployment, management and in-service support of teacher-aides within schools.

In accordance with knowledge that teachers should obtain at the pre-service level regarding ASD (highlighted in Table 4), teacher-aides should also achieve a similar understanding surrounding the complexities of the disorder. Essential course content for teacher-aides should comprise

1. Current, available research surrounding foundational information related to ASD, the use of particular strategies depending on the child's diagnosis, and using technology with students who have ASD in the classroom, such as specific apps, video modelling etc.
2. Complete hands-on practicum experiences with a collection of students who have ASD in order to demonstrate the complex differences which can be found within each student.
3. How to effectively collaborate with classroom teachers to ensure successful outcomes for students who have ASD, and
4. Assessing the use of particular strategies that have a solid research base for students who have ASD. Content could be taught, and then experienced first-hand during practicum placements.

Inclusion of ASD Courses: At What Cost?

Furthering the discussion earlier pertaining to the difficulties surrounding the inclusion of ASD specific courses in pre-service educator programs made by Hart and More (2013), we believe there is an added point to be made. The outcome from those providing the curriculum at each of the universities opens up opportunities for innovative and collaborative solutions such as nominating universities to particular areas where they might include ASD courses as a curriculum priority, with other universities following suit. Whilst time constraints and various content demands associated with teacher education curriculum can result in important content being overlooked, (e.g. effectively working with students who have ASD in a classroom), we believe these changes are necessary. Education programs should begin to acknowledge the prevalence of ASD in comparison to other disabilities, such

as a 289.5% increase in ASD diagnoses against other common disabilities such as Attention-deficit Hyperactivity Disorder (ADHD) 33% between 1997-2008 (Boyle et al., 2011; CDC 2012). General inclusive education courses can continue to include less prevalent disabilities that are more easily defined and managed by teachers and teacher-aides within the classroom. While the current study has not canvassed data on what basis those responsible for teacher education programs make these difficult choices, this is an important dimension in creating an evidence-led best mix of specific and generic address disability and appropriate pedagogy and an imperative for further research.

Conclusion

There is an absence of comprehensive teacher education programs which include vital information regarding ASD today in Queensland, Australia. Several implications are highlighted in this paper. Most importantly, the training of both teachers and teacher-aides at the pre-service level in Queensland, Australia, regarding foundational knowledge of ASD and follow-on professional development, needs to be addressed urgently. We have taken the evidence of prior research (e.g. Masterson et al., 2012; Shyman, 2012; Volkmar, 2007; West et al., 2011) as a first step in conceptualising such an address by outlining courses of essential study that Queensland institutions might begin implementing with those seeking state of the art professional preparation.

In addition to pre-service training related to ASD, both student teachers and teacher-aides need to be instructed on how to work collaboratively in order for inclusion to be real and successful in its purpose. Training school staff to develop effective collaborative groups is fundamental to progressing equity and excellence in education, as is training teachers to be skilled in offering support, and in mentoring and learning from teacher-aides. Teacher-aides and teachers play key roles in the ease and success with which students who have ASD are genuinely included into mainstream schools. Teacher-aides should not be required to function as the primary teacher of students who have ASD, and will not need to do so if appropriate pre-service and in-service training is provided.

Limitations and Future Research

While findings have provided clarity about current provision and indicated particular shortfalls that require urgent redress, further research is needed to progress this work beyond its current limitations. Notably, we had not included secondary pre-service courses and programs or professional learning of in-service educators in our analysis. Nor had we sought and reported the perspectives of in-service educators who currently work with students who have ASD on the data we had gathered on ASD courses currently offered to pre-service teacher and teacher-aide training programs in QLD, Australia.

Certainly, further research is needed to address these limitations, and also to determine whether the scope of what has been reported here as shortfall is generalisable elsewhere in the preparation of pre-service teachers and teacher-aides for supporting students who have ASD. Additionally, there are important issues of process that require investigative report. For example, it would be useful to document what policies and mechanisms for implementation, monitoring and refinement exist in Universities and teacher registration authorities for consideration and decisions on evidence-based rationale for what could, should and would be included in courses and programs.

Such information has implications for ongoing improvement of teacher and teacher-aide training programs and can play a key part in supporting what teachers and teacher-aides

in many studies have been reporting as their key challenges in recent years. Applicable training based upon research recommendations is essential if they are to meet these challenges within inclusive classroom environments. If institutions in Queensland, Australia, wish to have teachers and teacher-aides who are at the cutting edge of inclusive education for students who have ASD, consideration when creating pre-service programs must be aligned with research evidence such as findings outlined in this paper.

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