Evaluation of Special Education Preparation Programs in The Field of Autism Spectrum in Saudi Arabia

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Abstract
The purpose of this study was to provide information about the effectiveness of the autism *spectrum disorders (ASD) preparation program of Saudi universities from the perceptions of pre-service teachers that are currently studying in autism program. It was also to provide information about the number of Saudi universities that offer personal preparation programs for special education teachers preparing to serve individuals with ASD. An ANOVA was conducted to compare the level of satisfaction in five domain areas assessed across university training programs. The results indicated that, overall, students were satisfied with the special education programs quality offered in various Saudi Universities. Only a few concerns related to the ASD teacher's preparation programs have been found. There are public calls for Saudi Arabia higher-education institutions to be accountable to the importance of producing well-prepared professionals to work with ASD students.*

Keywords*: Special education teachers in Saudi Arabia, autism spectrum disorders (ASD) teacher preparation program, special education, pre-service teachers-preparation, special education pre-service teachers' knowledge in ASD.*

Introduction and Literature Review

Alnefaie (2014) pointed out that the number of students diagnosed with autism is increasing dramatically, and this increase raises concern among parents, physicians, and scientists. Alnefaie stated that in 1980, the incidence of autism was low, at a rate of five in 10 000. However, in 1990, many of the studies carried out in Japan, England, and Sweden determined the incidence of autism to be 37 in 10 000. He also pointed out that a recent study conducted in the United States indicated that for 8-year-olds, one child in 110 had autism spectrum disorder (ASD).

Ness and Chia-ling (2013) reported the number of students diagnosed with autism in Saudi Arabia. They noted: "the incidence rate for autism is 1.8 per 1,000—approximately

the same as that of most European countries" (p. 34). However, many studies have indicated that as the number of children diagnosed with ASD increases, special education teachers report challenges in meeting the unique needs of these students. Furthermore, there is a lack of adequate training and preparation to teach ASD students in the school system (Barnhill, Polloway, & Sumutka, 2011; Barnhill, Sumutka, Polloway, & Lee, 2014; Donaldson, 2015; Hart & Malian, 2013; Loiacono & Valenti, 2010; Mazin, 2011; Scheuermann, Webber, Boutot, & Goodwin, 2003; Simpson, Mundschenk, & Heflin, 2011).

Almasoud (2010) reported that in Saudi Arabia, teachers who teach students with autism lack knowledge and understanding of the disability and are incapable of adjusting their classroom environments. Haimour and Obaidat (2013) reported that general and special education teachers have a weak to acceptable level of knowledge about ASD. They found that general education teachers in the city of Jeddah had a weaker knowledge of autism compared with their knowledge of special education in general. Aldabas (2015) indicated that general education teachers are unprepared for inclusive education because no general teacher preparation programs in Saudi Arabia offer any courses that address special education. Al-Faiz (2006) stated that teachers in Saudi Arabia face challenges when working with children with autism because not all universities in Saudi Arabia offer a Bachelor or Master of Arts degree in Special Education. Al-Faiz also noted that in 2006, only one university of 10 universities in Saudi Arabia, King Saud University, offered a Bachelor's or Master of Arts degree in Special Education.

All in all, in reviewing the literature, researchers found that there has been no recent study that examines the number of universities in Saudi Arabia that offer a degree specialization in autism. The researchers also found only one study that investigated a schoolteacher's knowledge about ASD in Jeddah that was by Haimour & Obaidat (2013). However, that study did not examine all personal preparation programs in Saudi Arabia for future special education (pre-service) teachers (Haimour & Obaidat, 2013).

Few studies have evaluated the special education teacher preparation programs at the one university in Saudi Arabia, King Saud University, that offers degrees in special education (Althabet, 2002; Hussain, 2009). Hussain (2009) studied the perceptions of previous students who graduated from King Saud University to evaluate the effectiveness of the learning disability (LD) specialization area within the special education department. The targets of his study were teachers who graduated from the special education department at KSU, majoring in LD. The data were collected by using a survey consisting of five subscales that measured the perceptions of LD teachers about their preparation program: coursework, internship quality, classroom applications, professors' teaching skills, and personal learning experience. A total of 291 LD teachers were surveyed, and only 160 out of 291 (or 55%) responded to the study. ANOVA methods were used to determine whether certain independent variables—gender, teaching experience, and/or LD as the first choice of specialization—were significantly associated with the teachers' perceptions of their preparation program. The results indicated that no statistically significant differences in perceptions existed for any of the independent variables used. In general, results indicated that most LD teachers agreed their preparation program was effective.

In a related study, Althabet (2002) evaluated the effectiveness of the intellectual disability specialization area within the special education department at King Saud University. Althabet surveyed 255 teachers who graduated between 1992 and 2000. Those teachers were working in special education programs in regular education schools and in special education institutes. The surveys used in his study measured five domains: (a) coursework, (b) internship, (c) professors' grading, and (d) professors' teaching skills. Althabet found that teachers were mostly positive about their overall preparation experiences and content. The results showed significant differences between male and

female teachers in their perceptions of their preparation in the Special Education Program at King Saud University. Results also showed that no significant differences existed among recently graduated special education teachers in their perceptions of the effectiveness of their preparation program. Results showed that teachers did not perceive the effectiveness of the coursework to be strongly positive or negative.

It must be remembered that the increasing number of students diagnosed with ASD has led to a call for legislation, requiring more effective professional development programs in order to produce high-quality teachers. Thus, the concept of preparing those teachers must be taken into account and continues to be an area of concern. "Teachers with college degrees have been found to be more successful in working with children with ASD than are teachers with less training" (Alotabi, 2015, p.3) Therefore, there is a great need for trained special education teachers who are capable of serving students with autism. Al-Faiz (2006) stated that "without such preparation, teachers cannot prepare students with autism to become functioning and contributing members of the classrooms and, later, of society" (p. 4).

Research Purpose/Questions

This study is conducted to gather information about the effectiveness of the ASD preparation program of Saudi Arabia universities based on the perceptions of pre-service students who are currently studying in the autism program in Saudi Arabia. It is also conducted to provide information about the number of Saudi universities that offer personal preparation programs for special education teachers in the field of autism and to examine if Saudi Arabia has enough of these institutions. This study uses a survey method to answer the following questions: 1) How many universities in Saudi Arabia offer personal preparation programs for special education teachers in the field of autism? 2) Are there any differences in level of satisfaction among pre-service teachers enrolled in special education program majoring in ASD in the five domain areas of coursework, internship quality, classroom application, personal learning experience, and professors' teaching skills?

Null Hypotheses

H0: there are no statistically significant differences in the levels of satisfaction of pre-service special education teachers majoring in ASD and in the five domain areas.
H1: there are statistically significant differences in levels of satisfaction of pre-service special education teachers majoring in ASD and in the five domain areas.

Methodology

Research Design

The primary purpose of this study was to obtain the perceptions and opinions of a large number of special education teachers studying in Saudi universities. The design chosen for the current study was a descriptive non-experimental research design. According to Johnson and Christensen (2014), "The primary purpose of descriptive research is to provide an accurate description or picture of the status or characteristics of a situation or a phenomenon" (p. 407). The study is nonexperimental in nature because the researchers wanted to learn what pre-service teachers in Saudi Arabia are doing and thinking. Specifically, the researchers used a survey data collection approach to evaluate individuals' perceptions of pre-service teacher training within those special education programs

specializing in ASD. McMillan and Schumacher (2006) stated the following regarding the use of surveys:

> *Surveys are used to learn about people's attitudes, beliefs, values, demographics, behavior, opinions, habits, ideas, and other types of information. They are used frequently in business, politics, government, sociology, public health, psychology, and education because accurate information can be obtained for large numbers of people with a small sample. (p. 233)*

The design used in this study had two purposes: (1) to assess overall levels of satisfaction in five domains regarding special education programs offered in various Saudi Arabian university programs, and (2) to comparatively test if differences in satisfaction in these domains were associated with certain factors. An example of the latter purpose was to compare the level of satisfaction between male and female pre-service special education teachers specializing in ASD.

Data Collection Instrument

As mentioned above, Hussain conducted research about the perceptions of learning disability teachers regarding their preparation program at King Saudi University (KSU) in Saudi Arabia. His survey used a series of questions asking for responses on a four-point Likert rating scale where 1= strongly disagree (SD), 2= disagree (D), 3= agree (A), and 4= strongly agree (SA). That survey instrument was used for data collection purposes in the present survey. In addition, the questions in that survey were grouped into five subscales that are retained: (a) coursework, (b) internship, (c) professors' teaching skills, (d) classroom application, and (e) personal learning experience.

In addition, since the main purpose of the current study was to assess the perceptions of ASD teachers regarding their preparation at various Saudi Arabian universities, some terms on the Hussain survey were changed to fit the present study purpose. For example, learning disabilities (LD) was changed to autism spectrum disabilities (ASD).

The researchers also deleted the following questions that were unsuitable or unrelated to the present study's purpose from the demographic section: what types of certificates did pre-service teachers hold (because all of them currently are undergraduates), and "Would you recommend a friend to select the special education field?". The researchers also named the new survey *ASD in Saudi Arabia Universities* and adopted Hussain's (2009) four-point Likert rating scale response format: 1= strongly disagree (SD), 2= disagree (D), 3= agree (A), and 4= strongly agree (SA). This Likert scale was used to measure special education teachers' satisfaction in the five domain areas of coursework, the internship quality, classroom applications, and professors' teaching skills. In addition, the personal learning experience subscale had a five-point Likert self-assessment response format as follows: 1= inadequate, 2= weak, 3= average, 4= moderately strong, 5= very strong, and 9= N/A. Overall, the present survey had three sections: 1) 9 demographic questions, 2) 37 close-ended questions in four-point Likert scale format, and 3) 6 close-ended questions in five-point Likert scale format for a total of 52 questions.

Hussain (2009) used a content validity method to measure the validity of the King Saud University (KSU) LD survey. He used three Arab graduate scholars from English-speaking universities who were studying English literature and who specialized in translating documents from Arabic to English as judges. He then allowed their survey version to be examined and revised by different professionals from different university departments who were interested in the field of special education. Those departments

included special education, educational psychology, and curriculum and instructional education. Finally, 12 LD teachers (six males and six females), who had graduated from the special education department at KSU, changed and revised some questions in his survey.

In the present study, content validity was measured by having a second researcher who was familiar with the study purposes examine and revise English items to verify if what was supposed to be measured was actually being done. This person served as a George Mason University (GMU) expert. After the survey was reviewed and examined by that professional, the survey was translated into the targeted language (Arabic). Then, one Arab graduate scholar from GMU's special education department checked the target response with the original English survey.

To ensure reliability, Cronbach's alpha for estimating the internal consistency across items was used to determine the survey's reliability. The alpha coefficient was computed for the combined group of items in the five subscales and for each of the five survey subscales. Cronbach's alpha for the five subscales is presented below in Table 1.

Table 1. Internal Consistency Reliability of Instrument Subscales

Five Domains/Subscales	Number of Items	Cronbach α
Course Work	10	.694
Internship Quality	8	.792
Classroom Application	11	.875
Teaching Strategies	8	.813
ASD Program Effectiveness	5	.793
Total Questions	42	.914

Table 1 indicates overall high reliability of the instrument (Cronbach $\alpha = 0.914$) with high reliability coefficients of individual scales. However, items measuring coursework quality expressed moderate reliability (Cronbach $\alpha = 0.694$).

Study Population and Participants

The study population of universities included 13 public Saudi Arabian universities that offer special education programs. The curriculum of these 13 universities was examined to identify which of these offered teacher preparation programs specifically in ASD. The participant sample for this study consisted of male and female pre-service special education teachers attending one of these universities and specializing in ASD. All of these teachers were in the final years of their undergraduate programs. Thus, it represented a group with enough program experience that they could rate their satisfaction with all parts of the program, including their culminating internship experiences. All pre-service teachers specializing in ASD were invited to participate in the study on a voluntary basis, so the researchers could describe the scope of service teacher training offered within special education programs in Saudi Arabia.

A total of 467 teachers specializing in ASD were invited through requests forwarded them by their university professors, a procedure discussed later in this document to participate in this study. Of 467 teachers only 180 (39%) completed the survey. It is believed that most of those not participating did so for reasons unrelated to the survey content, such as the time of year during which data collection took place. Of the 180 teachers who participated, 84% were female pre-service special education teachers

specializing in ASD, and 16% of them were male pre-service special education teachers. Most (67%) of these participants were between the ages of 18 to 24 years. Almost half (48%) were enrolled in autism courses in two out of the 11 universities, with 25% of them in King Saud University and 23% in Princess Nora University. Of the 11 universities in Saudi Arabia, almost all of these students (99%) were working towards degrees in special education, and only 1% working towards degrees in humanities or social services. Of the specific majors these students had, 81% of them were had a joint major of behavioral disorders and autism, whereas 19% were specifically majoring in autism. However, the average number of student responses per university was 16. Given that 5 of the 11 universities are represented by student responses of 2-7 students, this may have contributed to the differences in university ratings that were found. Table 2 presents demographic information for the 180 pre-service teachers who completed the survey.

Slightly more than half (53%) of these participants had teaching experience of less than one year, while 34% of them had 1-4 years' experience, and 3% had five years of teaching experience. Among these 180 pre-service teachers, 73% of them reported that an Autism degree program was their first preference, and the remaining 27% stated that an Autism degree program was not their first preference.

Table 2. Demographics of the Participants

Variables	Categories	Frequency	Percentage
Gender	Female	151	84
	Male	29	16
Age	18-24 years	120	67
	25-34 years	52	29
	35- 44 years	10	4
University where you studied	King Saud University	45	25
	Almajmaah University	3	2
	Princess Nora University	42	23
	Talbah University	6	3
	Umm-al-Qura University	13	7
	Taif University	21	12
	Qassim University	13	7
	Tabuk University	2	1
	Al Jouf University	4	2
	King Faisal University	7	4
	King Faisal University	7	4
Department of Study	Special Education	178	99
	Humanities and Social Services	2	1
Major in Degree	Autism	34	19
	Behavioral Disorder and Autism	146	81

Stating their reasons for becoming ASD teachers, 68% indicated it was their personal interest to join the ASD teaching profession, 12% reported that doing so was their only available alternative, while 13% joined this profession because they had been guaranteed a job in it. Only 1% of students attributed their choice to become an ASD teacher to the field offering a better salary package. Regarding their academic averages,

almost 60% of students graduated with excellent GPAs, and there were 34% with very good and only 6% with good GPAs (See Table 3).

Table 3. Demographic Information

Variables	Categories	Frequency	Percentage
Experience	Less than a year	96	53
	1-4 years	62	34
	5 years	6	3
Autism as First Choice	Yes	131	73
	No	49	27
Reason for Becoming ASD Teacher	Only Alternative	22	12
	Personal Interest	122	68
	Ease of Major	1	1
	Job Guarantee	23	13
	More Salary	2	1
GPA	Excellent	108	60
	Very Good	61	34
	Good	11	6

Data Collection Procedures

Approval for conducting research with human subjects was obtained from the Institutional Review Board (IRB) at GMU and from the Ministry of Education in Saudi Arabia. To facilitate approval for the study, the major advisor professor at GMU (the second researcher on the present study) wrote an official letter to the Saudi Arabian-Cultural Mission of the United States. The letter explained the purpose of the study and how important it was to conduct the study in Saudi Arabia. Then, the Saudi Arabian-Cultural Mission of the United States gave the first researcher approval to have a field trip during the summer of 2016 for data collection. This student researcher had difficulty in collecting sufficient data and obtaining official approval for such collection from the Saudi Arabian Ministry of Education, thus making it difficult to contact each relevant university in Saudi Arabia.

The researcher, therefore, turned to an alternative method: contacting many professors in the field of special education program by posting a suitable recruitment notice on social media (using Twitter, Facebook, WhatsApp, and e-mail methods). Those professors who were interested were then re-contacted, provided a link to an online survey webpage created on SurveyMonkey, and asked to forward that survey link to their pre-service teacher students. This process occurred in mid-June 2016. At that time, likely participants were advised that their names were not required, demographic information would be kept confidential, and that participation was voluntary.

A follow-up message reminder was sent to these professors in July by e-mail and a group message on WhatsApp, again asking them to distribute the survey to those pre-service teachers to whom they thought might not have had any chance to look at to the survey link during the summer. Thus far, the combination of these two forms of contact with professors asking them to forward the survey link to suitable pre-service teacher students only produced 75 survey completions. Therefore, to supplement the number of ASD respondents, the researcher then relied more extensively on Twitter and Facebook and targeted the

academic accounts for each university in Saudi Arabia. This produced an additional number of 105 pre-service teachers specializing in ASD with usable returns. Other returns were eliminated because they were submitted by people outside Saudi Arabia and thus were not within the scope of the study, and others were discarded because enough survey questions for useful data analysis purposes were not completed.

Data Analysis

The survey data collected via SurveyMonkey was reviewed for basic distributional characteristics including incomplete responses. All missing responses were removed by list wise deletion and preserved completed responses only. Eleven universities were included in final analysis because no response was received from two universities. Once the data was verified for completed surveys, the data was exported to Microsoft Excel format for editing and finally to the Statistical Package for Social Sciences (SPSS) for more advanced data editing and analysis. In addition to eliminating missing data, outliers and other assumptions such as normality and homogeneity of the total and group scores were evaluated by statistical tests, however, no potential outliers were found in the data. The survey administered contained three negatively worded items which were reverse coded before performing statistical analysis.

Descriptive statistics, such as frequencies and percentages, were used to analyze the number of universities offering degree programs for special education teachers in the field of autism and to determine the demographic characteristics of those students. Descriptive statistics, including standard deviations followed by Analysis of Variance (ANOVA) methods, were used to analyze differences in satisfaction levels between subgroups of these students. Independent sample t-tests were also run to test if any significant differences existed between male and female students in the level of satisfaction among five domain areas: coursework, internship quality, classroom application, satisfaction concerning professors' teaching skills, and personal learning experience.

Results

The results presented here in summary form first show (in Tables 4-8) the variability in answers for each of the survey questions that are phrased in English, although they were administered in Arabic, that are then grouped into the five domain areas of interest in this study: coursework, internship quality, classroom application, satisfaction concerning professors' teaching skills, and personal learning experience. Tables show the percentage distribution of responses across each of the Likert rating scale categories followed by each question's mean based on assigning values of 1= strongly disagree through 4= strongly agree and standard deviation.

Table 4. Frequencies of Responses and Means for Coursework

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	SD
1	The number of courses given in the ASD major was sufficient	9%	39%	42%	10%	2.54	.801
2	The ASD courses given in the ASD major program do not need to be updated.	70%	27%	1%	2%	1.36	.623
3	The content material in the ASD courses was sufficient for teachers	10%	46%	37%	7%	2.38	.799

	in the field						
4	Coursework in the ASD major was not too theoretical.	43%	42%	13%	2%	1.74	.763
5	Textbooks in the ASD major were written clearly	3%	24%	64%	9%	2.78	.665
6	The coursework gave me a good understanding of ASD	5%	28%	55%	12%	2.74	.733
7	Argumentative alternative communication (AAC) was covered in sufficient depth for teachers in the field	11%	47%	34%	8%	2.34	.828
8	Argumentative alternative communication textbooks and materials were written clearly.	8%	41%	43%	8%	2.45	.800
9	I had extensive practical experience with AAC applications or devices.	5%	50%	37%	8%	2.47	.735
10	There is no gap between university coursework and the reality of ASD in the resource room.	42%	42%	13%	3%	1.66	.807
	Total					2.25	0.39

Table 4 shows slight agreement (M=2.25, *SD*= 0.39) of students regarding course work offered in special education degree programs at various universities in Saudi Arabia. Detailed analysis of responses confirmed their satisfaction level with course work, and almost 97% of students stated that their course work needed to be updated. Similarly, 85% of students considered their coursework as not being balanced and very theoretical in nature. Almost 84% of students indicated that their course work is not providing them with skills needed to practice in real situations and that a gap exists between university course work and the reality of ASD practices in the resource room.

Table 5. Frequencies of Responses and Means for Internship Quality

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	SD
1	The length of the internship was sufficient.	23%	33%	32	12%	2.25	1.02
2	Students received timely feedback from their supervisors during the internship	13%	19%	46%	22%	2.62	1.11
3	The internship was more useful than the classroom work	2%	7%	21%	70%	3.54	.87
4	The internship provided practical experiences for dealing with school administration	2%	8%	40%	50%	3.32	.83
5	During the internship, I applied instruction methods that I learned in the coursework of teaching students with ASD	10%	18%	57%	15%	2.69	.96
6	The internship allowed me to use my thoughts/ideas of special education in a practical way	10%	12%	55%	23%	2.87	.96
7	The internship provided practical	16%	15%	35%	34%	2.79	1.14

	experiences for dealing with parents of students with ASD						
8	During the internship, I provided assistive technology support for students with ASD	20%	26%	36%	18%	2.42	1.09
	Total					2.81	0.64

Table 5 shows overall moderately high agreement (M=2.81, *SD*= 0.64) regarding the quality of internship offered in special education degree programs in the field of autism in Saudi universities. However, 56% of students indicate that they are dissatisfied with the length of internship program and 46% of students indicated a lack of assistive technology support exists for students with ASD.

Table 6. Frequencies of Responses and Means for Classroom Application

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	SD
1	Develop and implement Individualized Education Plan	2%	6%	52%	40%	3.29	.68
2	Develop and implement Applied Behavior Analysis (ABA)	12%	21%	46%	21%	2.74	.96
3	Implement effective behavior management techniques	3%	8%	56%	33%	3.17	.75
4	Implement effective teaching techniques	4%	11%	62%	23%	3.03	.74
5	Implement effective methods of evaluation and diagnosis	8%	20%	49%	23%	2.84	.90
6	Implement effective language and development techniques for ASD students	10%	29%	49%	12%	2.53	.94
7	Implement effective social and interpersonal development techniques for ASD students	8%	21%	52%	19%	2.80	.87
8	Implement effective techniques such as the using of sign language to support non-verbal students with autism	21%	37%	34%	8%	2.22	.95
9	Develop and implement smart devices such as the iPad and computer that contribute in developing students with autism	21%	27%	34%	18%	2.42	1.08
10	Collaborate with Parents	10%	21%	49%	20%	2.73	.96
11	Collaborate with professionals at school (e.g., Psychologist)	7%	23%	45%	25%	2.84	.94
	Total					2.78	0.60

Table 6 shows an overall moderately high agreement (M=2.78, *SD*= 0.60) with classroom application of the special education programs offered in various universities in the field of autism. Overall, 58% of students disagreed with the provision regarding implementation of effective techniques such as sign language to support students with autism. Moreover, almost half of the surveyed students (48%) disagreed with the need to

develop and implement smart devices such as iPads and computers toward helping students with autism.

Table 7. Frequencies of Responses and Means for Teaching Strategies

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	SD
1	Use many instruction methods	9%	28%	48%	15%	2.69	.83
2	Maintain students' attention	8%	22%	62%	8%	2.69	.74
3	Fit their teaching methods for students of different levels	4%	31%	54%	11%	2.73	.71
4	Guide students to ASD websites	10%	33%	44%	13%	2.58	.86
5	Meet the individual needs of students	10%	28%	53%	9%	2.61	.79
6	Use technology in their instruction	10%	22%	54%	14%	2.72	.85
7	Provide sufficient time for office hours	10%	29%	50%	11%	2.61	.85
8	Maintain students' interaction outside of the classroom	6%	30%	52%	12%	2.68	.80
	Total					2.66	.53

Table 7 shows overall moderate agreement (M=2.66, *SD*= 0.53) regarding teaching strategies used in classrooms by professors. Overall, all students expressed their agreement for the quality of teaching strategies; however, a good number of students (43%) indicated that students are not guided to ASD websites.

Table 8. Frequencies of Responses and Means for ASD Program Effectiveness

#	Statement	Inadequate	Weak	Average	Moderate-ly Strong	Very Strong	Mean	SD
1	Provide relevant examinations/assessments. [either/or NOT both]	6%	14%	38%	32%	10%	3.25	1.05
2	Implementation various of assessment, such as testing, research, or field visits	11%	21%	27%	26%	15%	3.12	1.25
3	Providing sufficient time to complete examinations, field visits, or coursework	6%	19%	38%	25%	12%	3.17	1.08
4	Working with students to promote academic success	11%	13%	33%	22%	20%	3.25	1.26
5	Providing opportunities to discuss academic progress	10%	23%	32%	21%	14%	3.04	1.20
	Total						3.16	0.87

Table 8 indicates an overall high agreement (M=3.16, *SD*= 0.87) regarding program effectiveness offered at various universities in Saudi Arabia. Detailed analysis of responses indicated that their programs were considered average (38%) in terms of providing relevant exams and assignments with sufficient time to complete them (38%). Almost 42% of students felt that working with other students to promote academic success was their program's strength.

Comparisons

As shown in Table 9, independent sample t-test results of possible gender differences on five domains of special education programs in field of Autism in various universities of Saudi Arabia indicated that four of the five domains had non-significant differences between male and female students. These four domains include course work, internship quality, classroom application, and teaching strategies. However, a significant difference in male and female students' views was found regarding program effectiveness. Female students were found to be more satisfied than male students (*M*=2.82, *SD*=0.95).

Table 9. Mean Comparisons for Gender Over Five Domains

Five Domains	Male (n=29)		Female (n=151)		t-value	df	p
	Mean	SD	Mean	SD			
Coursework	2.18	0.38	2.26	0.39	0.92	178	0.36
Internship Quality	2.77	0.62	2.82	0.65	0.41	178	0.68
Classroom Application	2.59	0.60	2.82	0.59	1.91	178	0.57
Teaching Strategies	2.55	0.56	2.69	0.52	1.30	178	0.19
ASD program effectiveness	2.82	.95	3.23	0.84	2.37	178	0.02*
Note. * Statistically significant, p<.02							

The next section of results presents differences in perceptions of different domains across groups of students attending different universities. To better highlight the differences, each table is followed by a graph of each university's mean result in that domain.

ANOVA Results

Table 10. One-Way Analysis of Variance of Coursework by Universities

Source	df	SS	MS	F	P	η2
Between Groups	4.317	10	.432	3.16	0.001	.157
Within Groups	23.111	169	.137			
Total	27.427	179				

One-way ANOVA results were found to be highly significant in perceptions of Special Education preparation programs' course work among students attending various universities in Saudi Arabia, F (10, 179) = 3.16, p=0.001, η^2=.157. The eta-squared result of .157 also reflects the strength of relationship, which highlights that definite differences in perceptions by university attendance were found. Post-hoc pairwise comparisons indicated that only Princess Nora University (*M*=2.41, *SD*=0.36) was offering significantly better course work than Taif University (*M*=1.96, *SD*=0.31), while students at all other universities rated their coursework as relatively similar. The wide disparity between students' ratings at

these two universities is shown in Figure 1. However, the pairwise comparisons were conducted by using the Bonferroni procedure, dividing the overall alpha level of .05 for all tests by the number of tests.

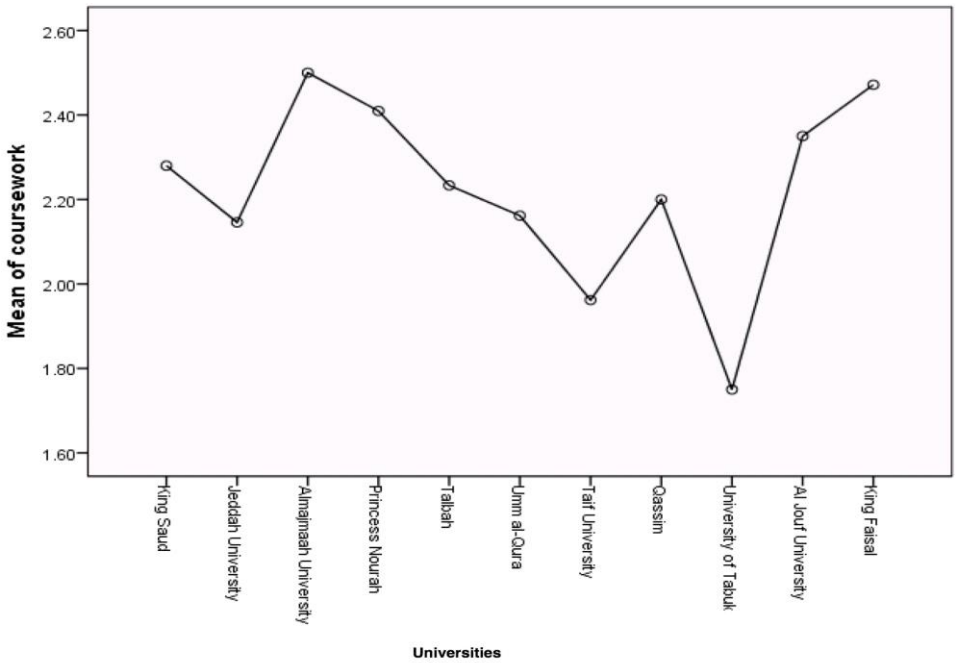

Figure 1. Mean Comparison for Coursework Quality Over Universities

Table 11. One-Way Analysis of Variance of Internship Quality by Universities

Source	*df*	*SS*	*MS*	*F*	*p*	η^2
Between Groups	11.789	10	1.179	3.23	0.001	.160
Within Groups	61.727	169	.365			
Total	73.516	179				

As in Table 11 shows, one-way ANOVA results were found to differ significantly in perceptions of special education preparation program internships' quality among students attending various universities: F (10, 179) = 3.23, p=0.001, η^2=.160. Post-hoc pairwise comparisons again indicated that only Princess Nora University (M=3.10, SD=0.45) was offering significantly better internship quality programs than those of Taif University (M=2.32, SD=0.66). No other universities' results differed significantly from any other.

Table 12. One-Way Analysis of Variance of Classroom Application by Universities

Source	df	SS	MS	F	p	η2
Between	8.448	10	.845	2.57	0.006	.132

Groups						
Within Groups	55.461	169	.328			
Total	63.909	179				

Table 12 presents one-way ANOVA results; these differ significantly in students' perceptions of the classroom application quality found in degree programs at various universities: F (10, 179)= 2.57, p=0.006, η^2=.132. Post-hoc pairwise comparisons indicated that only students at Princess Nora University (M=3.04, SD=0.57) considered their setting to provide significantly better classroom application of special education than students at Taif University (M=2.39, SD= 0.59). All other universities were rated as relatively similar in this domain and did not differ significantly.

Table 13. One-Way Analysis of Variance of Teaching Strategies by Universities

Source	*df*	*SS*	*MS*	*F*	*p*	η^2
Between Groups	8.578	10	.858	3.48	0.001	.171
Within Groups	41.656	169	.246			
Total	50.234	179				

Table 13 presents one-way ANOVA results, that like earlier tables, show highly significant differences in students' perceptions of teaching strategies used by professors and found in degree programs offered at their universities. Post-hoc pairwise comparisons indicated only Princess Nora University (M=2.96, SD=0.45) was significantly higher rated in their use of teaching strategies in special education programs when compared with Taif University (M=2.32, SD=0.56). The nine other universities were rated as relatively similar to each other in this domain and thus did not significantly differ.

Table 14. One-Way Analysis of Variance of ASD Effectiveness by Universities

Source	df	SS	MS	F	p	η^2
Between Groups	26.795	10	2.680	4.21	0.001	.199
Within Groups	107.671	169	.637			
Total	134.466	179				

As in earlier tables, one-way ANOVA results were found to differ significantly in students rating the ASD effectiveness in Special Education degree programs offered at various Universities: F (10, 179) = 4.21, p<0.001, η^2=.199. This domain showed the greatest degree of relation or differences across universities since the eta-squared value was greatest, explaining almost 20 percent. Post-hoc pairwise comparisons indicated significant differences across pairs of three universities. Princess Nora University (M=3.74, SD=0.75) was rated as offering significantly effective programs in ASD related to special education when compared with either Jeddah University (M=3.05, SD=0.69), Qassim University (M=2.71, SD=0.66) or Taif University (M=2.62, SD=1.07). All other universities were rated as similar in this domain.

Discussion

This study was designed to assess the effectiveness of autism spectrum disorder (ASD) special education teacher preparation programs offered by Saudi Arabian higher education public universities. Its data source came almost entirely from contacting pre-service students currently enrolled in these autism training programs. Using this data source, the study attempted to estimate the number of Saudi universities that offer such autism training programs. The study asked these students to complete a self-administered online survey dealing with their perceptions concerning the quality of these programs. Analyses focused on differences by gender and university used Likert scale ratings for five different domains: coursework, teaching strategies, internship quality, classroom application, and overall autism program effectiveness.

In gauging the number of autism teacher preparation programs, it is possible that study results were reasonably close to that actual number. Results found that 11 public universities in Saudi Arabia currently provide teacher preparation programs for special education teachers in autism. But did the 180 survey respondents represent a sufficiently representative sample of all of Saudi Arabia's graduate students? To examine that, Saudi Arabia's education system is known to currently include 25 publics and 27 private universities (Alqassem Dashash, Alzahrani, 2016). Let us exclude the at least eight institutions known by their titles to offer specialized, non-ASD-related educations, in areas including: Petroleum and Minerals, Science and Technology, Public Administration, Health Sciences, Business and Technology, Dentistry and Pharmacy, Medical Studies, or Science. ("Top Universities in Saudi Arabia," 2016). That would still suggest that study findings were based on roughly 40% of all public universities not dedicated to a specific content area.

The coverage of universities across the target universe of Saudi Arabian institutions may be even stronger. When comparing the listing of universities (shown in Table 2) that the 180 survey respondents reported attending with the "Top Universities in Saudi Arabia" (2016) listing cited above, one sees that survey respondents reported attending: 3 of the top 4 universities listed there (excluding one specialized institution), 4 of the next 8 listed (and non-specialized) institutions, and 4 were included of the next 9 listed (and non-specialized). Thus all 11 universities included in the study were in the top 21 (excluding 4 specialized) higher education institutions in Saudi Arabia, a coverage rate of 52%.

The study findings reported here may be somewhat exploratory but still represent a step forward in addressing the research goals of this study. In part, this may be due to the two-stage sampling process used, in which all likely professors in all likely Saudi universities were contacted and asked to forward the survey link to students. That process may not have produced a representative sample of student respondents, which may have resulted in a possible skew in findings.

For example, there appear to be few, if any, accurate counts of the proportion of females and males enrolled in teacher preparation programs in Saudi Arabia or reports of how many graduate students specialize in ASD coursework. It is true that a broader set of statistics come from a Statistical Summary of Higher Education Students by Agency for 2015-2016 provided by the General Authority for Statistics, the official governmental statistics unit of Saudi Arabia, in its Statistical Yearbook of 2015, Chapter 03, called "Education and Training." According to this source, 44% of all university students were males, and 52% of graduate students were females (General Authority for Statistics, 2015-2016). However, these statistics represent much broader categories than the present survey's findings, in which only 16% of those in graduate teacher preparation programs having an ASD

emphasis were male. The study also found that autism courses were offered at two out of eleven universities.

Nonetheless, this study produced useful findings that were not obtainable elsewhere to the best of the researchers' knowledge. The survey instrument was flexible: it was adapted through content validity reviews and parallel translation methods so that it could be administered in either Arabic or English. This ensured that students primarily comfortable with either language could readily understand the survey content. This likely increased its validity. Thus, it is possible that despite the disparity in gender counts, the results gathered may be plausible. Some of these results indicated that 68% of students were specializing in ASD studies due to their personal interest, 12% of them had joined the profession as the only available alternative for them, and another 13% had joined this profession since it provided a guaranteed job.

The survey also extended the utility of Hussain's 2009 survey by conducting Cronbach's alpha internal consistency reliability analyses of the same five scales that Hussain had used, although with a wider sample. Whereas Hussain's study focused on teachers majoring in Learning Disabilities and graduating in special education from one Saudi higher education institution, King Saud University, the present study included ASD students at 11 universities. Given that breadth of educational exposure, the present study showed that the same survey questions were quite reliable. As Table 1 showed, reliability coefficients ranged from .694 (Course work) to .875 (Classroom Application), with a median of .793 across the five scales.

Turning to the second study objective, there seemed to be an overall pattern that a fairly high proportion of respondents believed that their coursework and program scope needed updating and revision to be more practical and better meet their workplace needs. Almost 97% of pre-service teachers agreed that their coursework needed updating, with 85% considering it unbalanced and very theoretical in nature, and troublingly, 84% of pre-service teachers surveyed believed that a gap existed between their university course work and the reality of teaching students with ASD in the resource room. Other indications of this were that more than half (56%) of pre-service teachers were dissatisfied with the length of internship programs and close to half (46%) believed that students with ASD were suffered from a lack of assistive technology support. This view was supplemented by almost half of surveyed teachers (48%) not being well satisfied in the use of "smart devices" such as iPads and computers. A related survey item found that more than two-fifths (43%) of these teachers complained that their professor had not guided them to valuable ASD websites so that they could learn more about children with autism.

These problems directly affect the knowledge, skills, and quality of affected pre-service special education teachers and make them unprepared to deal with students with autism. Donaldson (2015) indicated that students with ASD often require more specialized services in schools because of their social, behavioral, and communication needs. Therefore, policy makers in Saudi Arabia should make appropriate decisions regarding the design and delivery of professional development related to educating students with ASD to produce highly qualified special education teachers with appropriate and adequate training.

These views were generally held by both male and female students alike, as ANOVA results found no statistically significant differences in mean ratings of four of the five domains that were measured: course work, internship quality, classroom application, and teaching strategies. Female students were found to be more satisfied than male students. However, this may be due to male participants possibly being underrepresented in this study, making the male results less statistically reliable. Therefore, future research into students' ratings of their program quality and what factors are associated with these

perceptions should use a more rigorous sample design and larger, more representative sample size.

Limitations of the Study

Several limitations may have influenced outcomes of this study. A major limitation in this study is that of having a smaller sample size than expected. The study began with a pool of 467 likely participants that shrank to 180 actual participants. This may have occurred because, due to circumstances beyond the researchers' control, the survey was distributed during the summer, when most students and professors in Saudi Arabia were on vacation. The survey was initially sent to more than 200 professors at Saudi Universities teaching special education by social media methods and by a group messaging app called WhatsApp. This approach was used so that professors could then send a notification or email to their students studying in autism programs. However, using this method, only 70 students responded to their messages and completed the survey. A follow-up message sent to the professors before the end of the summer also did not result in many more students deciding to participate in the survey after they returned from vacation. This smaller sample size should be noted as it may indicate relatively atypical or fewer male students who took part in the study, producing a possible shift in the direction of survey findings. In addition, those with relatively less computer access, or those with less familiarity with online survey completion may have chosen to leave the survey incomplete.

Second, the target population of the study was limited to those students currently majoring in ASD in Saudi Arabia. The study did not seek the perceptions of professors teaching and researching in this area at the 11 universities studied. Third, the study only used a survey instrument asking for perceptions as the primary method of gathering data. Respondents' attitudinal views could not be verified by gathering factual information, such as specific features of these teacher preparation programs.

Conclusion and Recommendation

The results indicated that, overall, students are satisfied with the quality of special education programs offered in various Saudi universities. The satisfaction expressed by these respondents extended to the coursework offered, quality of internship provided, teaching strategies, classroom applications, and effectiveness of autism programs.

Only few concerns related to applicability of coursework were found for the degree programs. These concerns included the following ideas: the coursework needed to be updated, need to be more practical than theoretical, and need to be well-versed with technological advancements. Similarly, internship length should be increased to provide hands-on experience to students in pre-service special education programs. However, it is essential for future researchers to conduct a qualitative study that examines reasons for why coursework in the field of ASD in Saudi universities is thought to need updating. Is it because the content of the coursework is very old or because the sequence of courses offered on various topics is not covered very well? Masterson et al. (2014) indicated that as part of undergraduate autism coursework, it is beneficial that students in ASD courses receive a solid overview of topics in ASD followed by diagnostic, assessment, etiological, biological, and theoretical courses focused on applied behavior analysis and empirically supported treatments as well as learn how students with ASD communicate communication.

In addition, Masterson et. al (2014) recommended an undergraduate intervention specialist program in ASD serving as an empirical guide for curricular development, and that it should be more practical and be based on evidence-based practices rather than

theoretical ones. They stated that evidence-based practices in ASD can serve as a valuable supplement to coursework. Therefore, as part of their coursework, students could be assigned to complete interview assignments (i.e., having students interview individuals impacted by ASD), and include them in group presentations to discuss a current or controversial topic in the literature. Masterson et. Al (2014) also posit other ideas: "it is also possible to have the class take part in a service-based activity or advocacy project aimed to improve the lives of individuals with ASD and their families…expert guest lectures [could be] presented through videoconferencing" (Masterson et. al, 2014, p.2648).

Shyman (2012) illustrated that because language and communication challenges are a central issue in ASD, a substantial amount of coursework in special education preparation programs should provide teachers with knowledge about natural and typical language development as well as potential differences in language development for individuals with ASD. Therefore, coursework in special education teacher preparation programs should explore theories of how language development is different for those with communication disorders and ASD specifically. Coursework should emphasize that "children with autism can develop solid functional language skills as well as other types of expressive symbolic communication skills through sign language, pictures, or an augmented communication device with picture symbols and voice output" (Kansas State Department of Education, 2009, p.3) Coursework should also emphasize how technologies such as computers and touch screen tablets can support students with ASD in overcoming communication barriers or even help them to develop new language skills (Sula & Spaho, 2014). Therefore, additional research is needed to describe strategies for improving the current practice for integrating assistive technologies coursework into ASD pre-service teacher education program preparation (Van Laarhoven & Conderman, 2011).

More importantly, pre-service ASD teachers believe that there is a gap between coursework and reality in a practicum setting. They also believe that their training time dealing with ASD students is insufficient. Strong (2014) states that a gap exists among what is known about instructional methods, what is learned from coursework, and what is implemented in a school setting during a practicum experience. Therefore, preparation and special education professional development programs should be scrutinized for their content, processes, and outcomes. This would serve to identify changes that could contribute to the implementation and improving of ASD teacher effectiveness.

In this survey, the quality of programs across various universities was found to be quite similar, except for some differences observed between Princess Nora University and Taif University. Both universities differed in coursework, quality of internship, teaching strategies and classroom application. However, for autism program effectiveness, three universities differed. Princess Nora University was found to differ significantly from Taif, Jeddah, and Qassim University in terms of ASD program effectiveness. Therefore, additional research is needed to conduct in-depth interviews and examine why these survey results were found. This will more clearly identify factors that impact teacher satisfaction within teacher preparation programs in the field of autism in Saudi Arabia.

Lastly, results of this survey were based on data collected during the summer, and only 180 out of 467 participants completed the survey. That may be why only 11 universities out of 25 Saudi public universities were found to provide special education teachers with preparation in ASD. Therefore, this study should be re-conducted during other months of the school year to bring about more statistically reliable findings.

In sum, the results of this study suggest that higher education institutions are responsible for the quality of their pre-service teachers, especially for those who are dealing with children with ASD. It is possible that Saudi Arabia higher education institutions need to become even more aware of the need to increase the preparedness and effectiveness of

special education teachers and create an even more conducive environment to effectively prepare teachers for working with children with ASD.

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