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Attitudes and Practices of Faculty Members Toward Implementing Universal Design for Learning at Higher Education Institutions

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Abstract:

The purpose of this study was to investigate the attitudes and actual practices of faculty members toward Universal Design of Learning tenets. After an extensive review of the literature, the Inclusive Teaching Strategies Inventory (ITSI) was selected and culturally and linguistically adopted as the most appropriate tool to achieve the study objectives. Faculty members (n=579) from universities located in the central region of Saudi Arabia participated. Findings revealed that faculty members highly endorsed implementing accommodations, accessible course materials, and inclusive instructional practices. Faculty's actual practices of UDL were measured against their attitudes, which revealed that their actual practices align with their attitudes in all UDL constructs. However, their actual practices and attitudes varied in construct related to instructional assessment and test accommodations. Recommendations emphasize the importance of professional development for faculty pertaining UDL practices. Further, future research should direct their focus to examine the experiences of SWD regarding faculty's instructional inclusive practices.

Keywords: SWD, faculty, universal design for learning, inclusive instructional practices.

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اتجاهات وممارسات أعضاء هيئة التدريس لتطبيق التصميم الشامل للتعلم بمؤسسات التعليم العالي

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المستخلص:

هدفت الدراسة الحالية إلى استقصاء اتجاهات أعضاء هيئة التدريس وممارساتهم لمبادئ التصميم الشامل للتعلّم ، ومقارنة اتجاهاتهم مع ممارساتهم الفعلية ، واشتملت عينة الدراسة على ٥٧٩ من أعضاء هيئة التدريس بجامعات المنطقة الوسطى بالمملكة العربية السعودية ، كما تضمّنت الدراسة مراجعة شاملة للأدبيات ، تُبني من خلالها مقياس Inclusive Teaching Strategies Inventory (ITSI) ، الذي قُنّن بوصفه الأداة المناسبة لتحقيق هدف الدراسة. وأشارت النتائج إلى أن أعضاء هيئة التدريس يؤيدون بشدة تطبيق التكييفات ، واستخدام أدوات تعليمية سهلة الوصول ، وتطبيق الممارسات التدريسية الشاملة. كما أشارت النتائج إلى أن ممارسات أعضاء هيئة التدريس الفعلية تتوافق مع اتجاهاتهم في جميع البنود الخاصة بمبادئ التصميم الشامل للتعلّم بالمقياس المُعدّ ، ماعدا محوري التقييم والتكييفات الخاصة بالاختبارات ، فقد تباينت ممارساتهم الفعلية عن اتجاهاتهم في هذين المحورين. وأوصت الدراسة بضرورة تبني الجامعات لبرامج تهيئة مهنية موجّهة لأعضاء هيئة التدريس في قضايا الممارسات التدريسية الشاملة ، وضرورة توجّه الأبحاث لتقصي تجارب الطلاب الجامعيين من ذوي الإعاقة بشأن الممارسات التدريسية الشاملة المُطبّقة في القاعات الدراسية.

الكلمات المفتاحية: الطلاب ذوي الإعاقة ، أعضاء هيئة التدريس ، التصميم الشامل للتعلم ، الممارسات التدريسية الشاملة.

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Introduction:

Higher education institutions in Saudi Arabia (SA) have experienced a steady increase in Students With Disabilities (SWD) enrollment. This is a response to the international legislative regulations, which SA officials obligate to, that reinforce equal access of individuals with disabilities to academic programs, and which states: "States parties shall ensure that persons with disabilities are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others." (United Nations 2006, p.18). Aligning with international forces, the Saudi promising vision 2030 had strategically directed to provide equal educational opportunities for individuals with disabilities. Consequently, many Saudi universities embrace diversity and establish inclusive environments through Disability Support Service (DSS) centers to support the diverse learning needs of college SWD (Human Rights Commission, 2019).

To implement inclusive practices, DSS centers across Saudi universities provide needed supports, through academic accommodations, for eligible college SWD. However, academic accommodations might be insufficient to address the needs of SWD and do not ensure success and quality education which may explain the persisted students' academic challenges such as class participation, college retention and graduation (Gawronski, Kuk, & Lombardi, 2016; Izzo, Murray, & Novak, 2008). Additionally, SWD might be unaware of the supports and accommodations they need or might be hesitant to disclose their disabilities and address their academic challenges by their own (Li et al., 2020; Lyman et al., 2016), others might be hesitant to request supports from their instructors due to their fear from getting rejected, losing social belonging, or getting negative social interactions in classrooms (Li et al., 2020). This issue is prevalent to students with hidden disabilities such as learning disabilities and attention deficit and hyperactivity disorders, consequently, their needs might be underestimated and overlooked by their faculty members (Morina, 2017).

Additionally, students reported that faculty lack of inclusive practices and varying their instructional methods impact their participation and interaction in class. Although faculty members are considered experts in their fields, they lack adequate knowledge of pedagogical and instructional strategies (Scott, McGuire, & Shaw, 2003). Thus, researchers suggest that if accommodations are considered through the development process of classrooms, learning materials, syllabi, and course delivery many students' challenges might be eliminated (Black et al, 2014). More importantly, effective implementation of such accommodations relies significantly on faculty member's knowledge, attitudes, and actual practices. (Lombardi et al, 2015; Lombardi et al, 2011b)

Universal Design for Learning (UDL) presents one of the inclusive practices that had been extensively investigated and presents promising instructional practices with college students (Fornauf & Erickson, 2020). In the United States, Higher Education Opportunity Act recognizes UDL as a scientifically-based framework that directs educational practices in universities. UDL offers a holistic approach in designing instruction that offers flexibility use by a broad range of students, reduces instructional barriers, increases students' access and participation without relying on expensive accommodations, and maintains high expectations for all students (Center for Applied Special Technology, 2021; Gawronski et al., 2016).

UDL is defined as:

A set of principles for curriculum development that gives all individuals equal opportunities to learn. UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone--not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs. (UDL on Campus, 2020).

UDL encompasses three primary pillars: offer multiple means for representation, offer multiple means of expression, and offer multiple means of engagement (Center for Applied Special Technology, 2021). The notion of UDL could increase classroom inclusivity and access for all students regardless of their age, color, culture, level of ability. Consequently, UDL is consistently receiving growing interest among postsecondary literature and university faculty (Li et al., 2020). It provides the fabric for inclusive teaching practices that supports various learning styles and needs of all learners, decreases the need for individual accommodations, and leads to positive student academic achievement, especially for SWD (Lombardi et al., 2011b; Schelly, Davies, & Spooner, 2011; Gawronski et al., 2016). Through our literature review, few studies were found that cover the use of UDL in Saudi educational settings (Alshaik, 2017; Alsalem, 2016; Alquraini & Roa, 2020), which focused solely on K-12 settings. Alsalem (2016) study investigated the effectiveness of a UDL training program that was implemented with teachers in the deaf and hard of hearing programs. Findings showed a significant positive impact of the training program in teachers' knowledge, skills, and willingness to implement UDL tenets within their instruction. Similarly, Alshaik (2017) examined the effectiveness of proposed training that was conducted with students teachers to increase their knowledge and skills in developing science educational materials based on the UDL principles. Findings showed the effectiveness of the UDL training in teachers' skills. On other endeavor, the study of Alquraini and Rao (2020) found that many teachers lack proper knowledge and skills and indicated a high demand for UDL training for teachers.

Many studies explored university faculty who had positive attitudes toward UDL practices (Dallas & Sprong, 2015; Dallas et al, 2014; Lombardi et al., 2013; LaRocco & Wilken, 2013), other researchers hypothesized that positive attitudes align with the actual implementation of UDL practices in the classroom. Researchers aimed to identify the

association between positive attitudes toward applying UDL principles and the actual implementation of such instructional practices in classrooms. In studying this association, Dallas et al, (2016) found that instructors who had positive attitudes toward inclusive strategies were more likely to implement these practices in their classrooms. Other studies found inconsistency between faculty attitudes and actions in some UDL aspects (Cook, Rumrill, & Tankersley, 2009; Lombardi et al., 2015; Lombardi et al., 2011b, West, Novak, & Mueller, 2016; Zhang et al., 2010). Some faculty were able to implement UDL principles; yet, they were less likely to have positive attitudes toward these principles (Lombardi et al., 2011b). In a similar aspect, Lombardi et al. (2015) investigated weather faculty attitudes consistent with their actual implementation across different countries (United States (U.S.), Canada, and Spain), they found that faculty in U.S. and Spain were inconsistent in their reported attitudes and actual implementation. Specifically, they had positive attitudes toward accessible courses, inclusive classrooms, inclusive strategies; yet, they showed less likelihood implementing these practices.

The purpose of the current study was to examine the attitudes and practices of faculty members regarding the implementation of inclusive practices using the UDL framework. As this study is the first in its scope and nature to investigates this group, it will have a valuable contribution to the literature as it fills the dearth of Arabic literature, particularly Saudi literature, that allows us to understand instructional practices of faculty members to include SWD at Saudi universities. In addition, the study will provide a validated tool in Arabic. The following research questions guided the study:

1. What are the attitudes of faculty members of Saudi universities toward UDL?
2. What is the level of UDL implementation of faculty members of Saudi universities UDL?
3. Are there significant differences between the faculty's attitudes and actual practices?

Methodology

The purpose of this study was to examine the attitudes and level of UDL practices of faculty members in Saudi universities. We employ a descriptive cross-sectional method to examine these two main elements of our study through conducting an electronic survey that was disseminated to study sample.

Instrument

The study utilized a web-designed self-report questioner that was developed based on literature review. Several studies (Alrayes & Alkharji, 2010; Bakri, 2019, Dallas et al., 2016; Lombardi et al, 2011b; Lombardi et al., 2015; Hartsoe & Barclay, 2017) reviewed, no Arabic instrument was identified. We selected the Inclusive Teaching Strategies Inventory (ITSI), (Lombardi et al., 2011a), and received ITSI developers' permissions.

The ITSI encompasses three main sections. The first section contained demographic information, where participants were asked to identify (gender, the university, faculty academic rank, years of teaching experience, college, academic discipline, their experience teaching SWD, courses they taught those students, and number of SWD). The second section measured faculty attitudes pertaining three main constructs: (a) accommodations, (b) accessible course materials, and (c) inclusive instructional classroom practices. Same constructs were included in the third section, where faculty asked to rate their actual practices towards those constructs. The ITSI contained two types of responses: attitudes and actions. In the attitude section, using a 5 Likert scale, the response options range from (strongly agree to strongly disagree) with a score from 5-1, respectively. While the actions section used a 5 Likert scale, the response options range from (always to never).

The ITSI contained a total of 66 items, 33 items included in the attitudes section and 30 items in the actions section.

Procedures and participants

After we obtained the Institutional Review Board approval (Number 18-0290) from our university, the electronic ITSI was sent through several steps. First, we identified three universities based on certain criteria: (a) universities are located in the central region of SA, and (b) had DSS offices. Then, during Spring 2020, research participation invitations were sent to identified universities for recruiting faculty members. Simultaneously, we disseminated email invitations to faculty members at selected universities, indicating the purpose of the study, how the study results would be used and kept, data confidentiality procedures, and researchers' contact information to receive any potential inquiries from the study participants. Five hundred seventy-nine faculty members completed the survey, Table (1) shows the demographic information of the study participants.

Table(1)

Demographic information

Category		Frequency	%
Gender	Females	459	%79
	Males	120	%20.7
Total of Faculty		579	%100
College	Education	132	%23
	Art	168	%29
	Management and Business	90	%15.5
	Science	48	%8.3
	Medicine and Health Sciences	42	%7.3
	Engineering	27	%4.7
	College of Art and Design	21	%3.6
	Community	%51	%8.5
Faculty Academic rank	professor	36	%6.2
	Associate professor	99	%17.1
	Assistant professor	249	%43
	lecturer	147	%25.4
	Teaching Assistant	48	%8.3

Category		Frequency	%
Teaching experience	6 years or more	399	
	5 year	21	
	4-2 year	39	
	<2 year	231	
The approximate number of SWD that a faculty member studied	over 20	15	
	20-11	18	
	10-6	42	
	5-1	261	
	I have never had that	213	
	Don't know/not sure	30	

Validity

The ITSI instrument was used in many studies (e.g. Lombardi et al., 2011a; Lombardi et al. 2011b; Lombardi et al.; 2015; Dallas & Sprong, 2015; Hartsoe & Barclay, 2017). As this is the first study using the ITSI in Arabic, we followed several steps to ensure the instrument validity. After obtaining permission to use the ITSI, we translated the instrument to Arabic and then was back-translated to English. Minor changes were made based on the translation process before it was sent to field experts in UDL to ensure content validations. The field experts reviewed the items' cultural and linguistic appropriateness and items' clarity and relevance to their construct, then, we revised the instrument based on the experts' feedback and comments. Then five faculty members used the ITSI and then developed an electronic Arabic version of the ITSI using Survey Monkey.

Reliability

To examine the ITSI internal reliability, we ran statistical testing to identify Cronbach's alpha coefficient. A minimum value of 0.70 was considered sufficient and 0.80 was preferred to ensure the internal reliability of the instrument (Nunnaly, 1975). An overall value of 0.922 was detected, which shows high internal reliability for the entire instrument. Besides, we

tested the reliability of the ITSI constructs and subconstructs; faculty attitudes toward the implementation of UDL practices and the three subconstructs ranged between (0.75 to 0.88). Internal reliability of the three subconstructs of the faculty practices toward the implementation of UDL practices ranged between (0.81 to 0.92).

Data Analysis

The Statistical Package for Social Sciences 26.0 (SPSS) was used to analyze the data. After data collection was completed, we reviewed the data to extract outliers, replicated values. Then, respondents who did not complete demographic information and selected one answer for all items were removed. Consequently, 48 respondents were removed, and data from 579 respondents were analyzed. To answer the first and second research questions, descriptive statistics were conducted through frequencies, percentages, means, standards deviations, and means ranks. These values were identified for all items included in both, attitudes and actual practices, sections. Paired t-test was used to identify the differences between the faculty attitudes and their actual practices. All results presented in table (2-6) and detailed description are included in the results and discussion section below.

Results and Discussion

The study investigated the attitudes and actual practices of faculty members at SA universities regarding their inclusive practices through employing UDL principles. The study also detected any significant differences between the faculty attitudes and their actual practices implementing UDL practices. Hence, the following section portrays study results along with discussion by first, showing: (a) faculty members attitudes toward implementing UDL, (b) faculty members actual practices employing UDL practices, and finally (c) revealing any significant differences between faculty attitudes and actual practices. All results are presented using tables accompanied by brief descriptive texts of figures included in the tables. Implications for practice and study limitations are discussed.

Faculty attitudes toward the implementation of UDL practices.

The first part of the ITSI was used to measure faculty attitudes toward several UDL practices that encompassed three main subscales: accommodations, accessible course materials, and inclusive instructional classroom practices with means averaging from (4.29, 4.00, 4.21) respectively with an overall mean of (4.201), as shown in (table 2). Findings revealed that faculty members hold positive attitudes toward implementing UDL practices through accommodations and UDL concepts subscales. Specifically, faculty members reported that they allow students to use assistive technology and other auxiliary aids during lectures, provide them with their notes before lectures, are flexible in changing assessment methods, and offer SWD with multiple assessment choices.

Table(2)

Results of faculty members attitudes toward UDL

Construct 1: Accommodations		
Domain Items	**Mean**	**SD**
I believe that it's important to allow SWD to use assistive technology (recorders or videos) during lectures, even when such technologies are not permitted for use by students without disabilities.	4.497	0.770
I believe that it's important to allow SWD to use assistive technology (laptop, calculator, spell checker) to complete exams, even when such technologies are not permitted for use by students without disabilities.	4.461	0.734
I believe that it's important to provide copies of my lecture notes or outlines to SWD.	4.269	0.852
I believe it's important to provide copies of my overhead and/or PowerPoint presentations to SWD.	4.316	0.833
I believe it's important to allow flexible response options on exams (e.g. change from written to oral) for SWD)	4.155	0.903
I believe it's important to extend the due dates of assignments to accommodate the needs of SWD.	4.155	0.897
I believe it's important to allow extended time on exams for SWD.	4.279	0.867
I believe it's important to spend extra time to provide needed support for SWD.	4.232	0.790

Construct 2: Accessible Course Materials		
Domain Items	**Mean**	**SD**
I believe it's important to use a course website (e.g. Blackboard, or faculty web page).	4.378	0.688
I believe it's important to post course materials electronically for all students (e.g. blackboard).	4.471	0.668
I believe it's important to upload my lecture notes online for all students (on Blackboard or another website)	4.305	0.716
I believe it's important to post electronic versions of course handouts and activities.	4.305	0.716
I believe it's important to allow students flexibility in submitting assignments electronically (e.g. email, digital cloud).	4.331	0.771
I believe it's important to allow SWD to submit extra credit assignment, even when such permission is not permitted for use by students without disabilities.	3.378	1.191
I believe it's important to reduce course reading for SWD, even when I would not allow a reduced reading load for students without disabilities	3.238	1.212
Construct 3: Inclusive Instructional Classroom Practices		
Domain Items	**Mean**	**SD**
I believe it's important to repeat the question back to the class before answering when a question is asked during a class session.	4.04	0.736
I believe it's important to begin each class session with an outline/ agenda of the topic that will be covered.	4.440	0.689
I believe it's important to summarize key points throughout each class session.	4.456	0.635
I believe it's important to connect key points with larger course objectives during class sessions.	4.487	0.577
I believe it's important to use a variety of technology tools (e.g. podcast of lecture, smart board) so my course materials can be available.	4.507	0.603
I believe it's important to use interactive technology to facilitate class communication and participation (e.g. discussion board, Whatsapp, Twitter).	4.331	0.716

Construct 3: Inclusive Instructional Classroom Practices		
Domain Items	**Mean**	**SD**
I believe it's important to present course information in multiple formats (e.g. lecture, text, graphics, audio, video, hands-on exercises).	4.342	0.732
I believe it's important to create multiple opportunities for student engagement.	4.580	0.562
I believe it's important to survey my students, in advance, to assess students' expectations about the course, and anticipate any possible barriers to success in the course.	4.238	0.716
I believe it's important to include a statement in my syllabus inviting SWD to discuss their needs with me.	4.357	0.728
I believe it's important to use various ways and strategies during my lecture (e.g. small groups, peer support, case study, hands-on activities, brainstorming, critical thinking)	4.518	0.594
I believe it's important to use visually presented materials during my lecture (e.g. pictures, videos, graphs, interactive simulation).	4.456	0.602
I feel comfortable when talking with a student with disabilities.	4.388	0.643
I believe it's difficult to work with SWD.	3.02	1.296
I believe it's important to allow my SWD to express their understanding and skills using various ways, other than the traditional assessment ways, by offering options (e.g. exam, write a report, online project)	4.217	0.792
I believe it's important to be flexible with my students in the assignment submission due dates when my students express their need to.	4.072	0837
I believe it's important to allow my SWD multiple ways for expression during exams (e.g. changing from written exam to oral), when my students express their need to.	3.984	0.908
I feel that SWD receive unfair privileges.	3.057	1.18

Table(3)

Overall means and SDs of ITSI constructs

Construct	Mean	SD	Rank	Direction Level
Accommodations	4.295	0.569	1	Very high
Accessible course materials	4.052	0.541	3	High
Inclusive instructional classroom practices	4.214	0.446	2	Very high
Overall mean	4.201	0.424	Very high	

Results revealed that faculty supported the implementation of accommodations in the classroom and provide all means and methods possible to include and embrace SWD in classrooms. These findings are consistent with findings of (Lombardi et al., 2013; Dallas & Sprong, 2015; Dallas et al., 2014). On average, all study participants highly favored all three subscales, however, we found that faculty rated slightly lower rates on items that require faculty to make minor changes in the means of assessment and expressions and to offer extra time for students in submitting course assignments. The rate of those items was not consistent with the high rate that other items received (e.g. I believe it's important to provide copies of my overhead notes or outlines to SWD). This is consistent with Lombardi et al., 2011a who found that faculty were less likely making changes in means of assessment as they perceived it impact their course integrity. We claim that faculty were hesitant to make changes in assessment methods as this practice imply that changes in course assignments and activities may not be favored or supported in some their universities.

Many academic programs in the Saudi universities are obligated to adhere to specific standards determined by the Education and Training Evaluation Commission, which has the authority to evaluate, assess, and provide accreditation to academic programs in public and private sectors to promote quality of education and training (Education and Training Evaluation Commission, 2021). To meet these standards, faculty members are required to follow course specification forms that were priorly developed by the academic department. Course specifications include instruction modes, teaching strategies, assessment methods, student academic counseling and support, and learning resources that faculty members must implement in their teaching. Any changes to these strategies or assessment methods require academic department formal approval. We believe that this aspect plays a vital role in faculty responses to the ITSI tool, especially items that include assessment alterations as they were hesitated to make any changes to the assessment methods in a response to their students' special needs.

Nevertheless, findings also showed faculty members' feelings toward working with SWD, especially in items (I found it hard to work with SWD compared with students without disabilities; I feel that SWD receive unfair benefits) as responses scored average and did not reach consensus. These findings suggest that faculty members' various feelings toward working with SWD. We believe that this could highly be attributed to the faculty academic discipline (e.g. Education, engineering, arts, and other majors), and years of experience. These factors were explored in other studies (Harstsoe & Barclay, 2017; Dallas et al., 2014; Li et al., 2020) and found similar results. It also could be attributed to the faculty's lack of disability knowledge and training, which suggests the need for developing disability training and inclusive pedagogical practices which will provide the adequate support that faculty members need. Furthermore, faculty were unsure whether SWD have the right to receive accommodations, half of them agreed that SWD receive unfair privileges. This attitude might refer to the faculty experiences working with students with hidden disabilities (e.g. learning disabilities, attention deficit and hyperactivity disorders) and the validity of the disability's existence and its associated challenges that students encounter.

Faculty practices toward the implementation of UDL practices.

The second section of the ITSI measured the actual practices implementing UDL principles on the same subscales: (accommodations, accessible course materials, and inclusive instructional classroom practices) with means ranging from (3.53, 3.61, and 3.94) respectively, as seen in Table (4). The overall mean is (3.714) which is lower than the attitudes section. Results showed that faculty reported that they allow SWD to use assistive technology and other auxiliary aids during lectures, spend extra time with their SWD to provide support, which is consistent with the faculty attitudes toward these practices. This finding aligns with what Lombardi et al. (2015) who found that faculty members scored high in implementing accessible course materials and delivering inclusive instructional practices in classroom which also consistent with (LaRocco & Wilken, 2013; Lombardi et al., 2011a). Faculty

members reported that implement accessible course materials, especially the use of technological accessibility features. This might be attributed to the faculty's adherence to their institutions' requirement to embed technological features into their lectures. Moreover, most faculty members might be trained to use recent instructional strategies, thus, they are confident in their implementation of accessible practices in their classrooms.

Despite the high level of faculty's UDL implementation, they were reluctant to implement some of the practices, especially in the accommodations construct of the ITSI. They scored themselves moderately lower in using (laptop, calculator, and/or spelling corrector) during exams or submitting assignments, allowing extended time on exams and assignments due dates to accommodate the needs of SWD, providing copies of my lecture notes or outlines to SWD. Findings also revealed that most faculty members do not allow their SWD to submit extra assignments as a bonus and do not reduce the amount of course information or text for their SWD. allowing their SWD to offer multiple options for expression and responding to exam questions (e.g. changing a written exam to an oral exam), when their students ask for it. This might be attributed to the faculty lack of knowledge of UDL and indicated their needs for UDL training needs that would aid them to meet the need of their students including SWD. This aligns with LaRocca and Wiken (2013) who found that faculty's lack of UDL implementation was due to their lack of UDL training.

Table(4)

Results of faculty members actual UDL practices

Construct 1: Accommodations		
Domain Items	**Mean**	**SD**
I allow SWD to use assistive technology (recorders or videos) during lectures, even when such technologies are not permitted for use by students without disabilities.	3.487	1.497
I allow SWD to use assistive technology (laptop, calculator, spell checker) to complete exams, even when such technologies are not permitted for use by students without disabilities.	3.362	1.515

Construct 1: Accommodations		
Domain Items	**Mean**	**SD**
I provide copies of my lecture notes or outlines to SWD.	3.243	1.450
I provide copies of my overhead and/or PowerPoint presentations to SWD.	3.585	1.453
I allow flexible response options on exams (e.g. change from written to oral) for SWD)	2.875	1.435
I extend the due dates of assignments to accommodate the needs of SWD.	3.352	1.426
I allow extended time on exams for SWD.	3.383	1.503
I spend extra time to provide needed support for SWD.	3.575	1.361
Construct 2: Accessible Course Materials		
Domain Items	**Mean**	**SD**
I use a course website (e.g. Blackboard, or faculty web page).	4.139	1.220
I post course materials electronically for all students on (e.g. blackboard).	4.471	1.173
I upload my lecture notes online for all students (on Blackboard or another website)	3.704	1.363
I post an electronic version of course handouts and activities.	3.906	1.289
I allow students flexibility in submitting assignments electronically (e.g. email, digital cloud)	4.103	1.165
I allow SWD to submit extra credit assignments, even when such permission is not permitted for use by students without disabilities.	2.772	1.561
I reduce course reading for SWD, even when I would not allow a reduced reading load for students without disabilities.	2.549	1.571
Construct 3: Inclusive Instructional Classroom Practices		
Domain Items	**Mean**	**SD**
I repeat the question back to the class before answering when a question is asked during a class session.	4.139	1.095
I begin each class session with an outline/agenda of the topic that will be covered.	4.228	1.053
I summarize key points throughout each class session.	4.233	1.069
I connect key points with larger course objectives during class sessions.	4.160	1.12

Construct 3: Inclusive Instructional Classroom Practices		
Domain Items	**Mean**	**SD**
I use a variety of technology tools (e.g. podcast of lecture, smart board) so my course materials can be available.	4.088	1.124
I use interactive technology to facilitate class communication and participation (e.g. discussion board, Whatsapp, Twitter).	3.960	1.250
I present course information in multiple format (e.g. lecture, text, graphics, audio, video, hands-on exercises)	3.94	1.246
I create multiple opportunities for student engagement.	4.310	1.012
I survey my students, in advance, to assess students' expectations about the course and anticipate any possible barriers to success in the course.	3.844	1.204
I include a statement in my syllabus inviting SWD to discuss their needs with me.	3.435	1.475
I use various ways and strategies during my lecture (e.g. small groups, peer support, case study, hands-on activities, brainstorming, critical thinking)	4.119	1.088
I use visually presented materials during my lecture (e.g. pictures, videos, graphs, interactive simulation)	4.01	1.134
I allow my SWD to express their understanding and skills using various ways, other than the traditional assessment ways, by offering options (e.g. exam, write a report, online project).	3.730	1.134
I am flexible with my students in the assignment submission due dates when my students express their need to.	3.740	1.298
I allow my SWD multiple ways for expression during exams (e.g. changing from written exam to oral) when my students express their need to	3.352	1.473
I repeat the question back to the class before answering when a question is asked during a class session.	4.139	1.095

Table(5)

Overall means and SDs of ITSI construct

Subscale	Mean	SD	Rank	Direction Level
Accommodations	3.358	1.119	3	Moderate
Accessible course materials	3.618	0.940	2	High
Inclusive instructional classroom practices	3.949	1.248	1	High
Overall mean	3.714	2.31	High	

Differences between faculty attitudes and actual implementations of UDL principles.

Findings revealed that the attitudes of faculty members aligned with their practices, however, their attitudes and actual practices vary in other aspects, as shown in table (6). Particularly, practices that require faculty members to alter instructional assessment methods and implementing accommodations during exam performances while they highly endorsed these exact practices. This could be attributed to the lack of training that faculty members had on how to meet the needs of their SWD. This finding aligns with (Bakri, 2019; Lombardi et al., 2011b; Alonizy & Turkestani, 2019) that showed that faculty members who had a prior disability training programs had higher level of knowledge and practices regarding UDL practices. Furthermore, according to Alonizy & Turkestani (2019) and Bakri (2019), faculty members in Saudi universities lacked proper background about disability and educational needs of SWD. The faculty reluctance to implement some of the UDL practices such as changing assessment methods or allowing students to select a method of class participation could be due to the limited time, large volume of class students, and lack of proper knowledge and training on how to alter some of the assessment modes, class activities, and other procedures that meet the needs of diverse students. This is consistent with the findings of Dallas et al., (2016) who found inconsistency between faculty's attitudes and actual practices which were due to the hardship of making major changes in the course requirements which was highly associated with the lack of time, knowledge, resources, and support.

Table(6)

Results of differences between faculty members attitudes and actual practices toward UDL

Subscale	Attitudes N= 579		Actual practices N= 579		T-value	P
	Means	SD	Means	SD		
Accommodations	34.36	4.55	26.86	8.95	23.72	0.00
Accessible course materials	28.4	3.78	25.33	6.58	12.52	0.00

Subscale	Attitudes N= 579		Actual practices N= 579		T-value	P
	Means	SD	Means	SD		
Inclusive instructional classroom practices	75.86	8.04	59.24	12.48	41.59	0.00
Overall faculty attitudes and actual practices	138.63	14.02	111.44	23.1	37.34	0.00

Inevitably stating, faculty members may lack pedagogical backgrounds, especially those whose academic disciplines are not in education. Some faculty members are considered experts in their field; however, they may lack sufficient knowledge and pedagogical skills allowing them to modify their instruction (Scott, McGuire, & Shaw, 2003). This can explain their hesitation changing their instructional practices and make them perceive it as they are compromising course standards.

Findings showed a clear gap between and contradiction between faculty's attitudes and their actual practices in some of the items. To elaborate, faculty reported high positive attitudes toward statements: it's preferable to provide the SWD with the class notes before the lecture, while it is not offered to all students, I think lecturer should encourage their SWD to use assistive technology "laptop, calculator, and spelling corrector" during exams, while they are not allowed to all students. Although those statements scored high, these exact statements were rated moderately by faculty members when they responded to the (action) domain of the survey. This inconsistency could be due to the faculty commitments and high accountability toward the course design and their hesitation to alter any part of the course. It is imperative to mention that faculty members across all Saudi universities are required to adhere to the Study and Exam regulations that mandates type of assessments that every course should include.

We also claim that faculty members lack sufficient knowledge of who SWD are and their characteristics and their different way of learning, this

impacts their willingness to implement UDL practices. Moreover, some accommodations require time and additional effort from the faculty side, for instance, some faculty members may perceive providing extra time for SWD requires additional effort and time which they may lack. Additionally, faculty members could perceive implementing accommodations and other inclusive practices to be the DSS's responsibility.

Our study findings align with other studies that were conducted in other countries and other contexts (e.g. Dallas et al., 2016; Lombardi et al, 2011b; Lombardi et al., 2015). These studies identified an inconsistency between faculty attitudes and their actual implementation, nevertheless, it is unknown why faculty members do not implement what they endorse, this may be attributed to lack of institutional support and faculty's limited time implementing UDL practices (Raue & Lewis, 2011; Zhange et al., 2010).

It is crucial to mention, that faculty members are hesitant to implement some of the UDL practices could be attributed to their lack of knowledge of UDL. The area of UDL is a considerably new concept, especially at university levels in SA and the Arabic region. Many faculty members may lack proper knowledge and skills of such concepts. Moreover, the low reinforcement of many universities that require faculty members to implement UDL practices and lack of UDL training programs could play a role in the faculty's minimal implementation of some of the UDL practices. Additionally, many SA universities do not pay the needed attention to the existence of a diverse group of learners and the need to address this notion during curriculum development and instruction delivery. Although plenty of evidence exists that supports the need to implement UDL practices across all educational levels, SWD still encounter many challenges, which cause many educational systems to be hesitant for implementing them (Griful-Freixenet et al., 2017).

We claim that faculty members desire to choose socially accepted responses, this explains the difference between faculty attitudes and some of their actual practices. Faculty members might believe that their responses allow them to

adapt socially acceptable values, to obtain social approval, and to prevent them from being socially criticized (King & Brunner 2000; Huang et al., 1998; Van de Mortel TF, 2008). Such responses are not guided by the participants' deception or self-deception, yet, those responses are indicative of the faculty self-protection and social conformity (Yezbec et al., 2004).

Limitations

Through study investigation, several limitations were detected. The first limitation pertains to the limited regional scope, the study covered universities located in the central region. Although Saudi universities share similar institutional factors, this limitation may impact the generalizability of the study results. However, the study findings could be considered preliminary and have the potential to guide efforts that Saudi universities undertake to include SWD. The second limitation was the low response rate that we received. As discussed by Fan and Yan (2010), online surveys are consistently present exclusive challenges for researchers, as web surveys receive 11٪ lower rate compared with other survey methods. The response rate of the ITSI was not as expected, we took further practices to reach higher number of responses and 579 was the highest we could obtain. We believe that this is attributed to the length of the ITSI, as the inventory encompasses three major domains that are explicitly associated with the study research questions revolving around faculty attitudes towards UDL practices and their actual practices towards implementing UDL practices and finding any differences between the two constructs.

The third limitation of the study is that we did not examine any attributable variables (e.g. age, sex, academic discipline, type of institution, college, years of experience, and prior disability training). We recognize the importance to investigate the influence of such variables on the faculty responses, however, the primary aim of the study was to examine the faculty attitudes, actual inclusive practices embedding UDL principles and identify any differences between these two constructs. Future research could focus

on the influences attributable variables could have on the responses (e.g. Gawronski et al., 2016; Hartsoe & Barclay, 2017; Lombardi et al, 2011b; Dallas et al., 2014). The last limitation of the study pertains to higher numbers of female participants compared with male participants, as this proportion occurred due to the study researchers' affiliation with a women-only university. This provides the study researchers direct and fast reach to study participants.

Implications for practice

Although the primary objectives of the study were to explore faculty attitudes and practices regarding UDL principles, the ITSI presents a valuable tool to be used by future researchers, as this is the first Arabic version of the inventory. The ITSI was widely used in the literature (e.g. Lombardi et al., 2011a; Dallas et al., 2014; Gawronski et al., 2016; Hartsoe & Barclay, 2017). This study should be replicated across different regions in SA to reach additional validity and reliability of the tool. This study provides the literature with needed findings regarding the faculty members' inclusive practices and their attitudes toward implementing accommodations and inclusive instructional methods through UDL tenets. Additionally, as study results show, there is a high need to train faculty members on UDL practices that would promote faculty instructional practices. On other hand this may guide future research to conduct experimental studies.

Furthermore, we believe that the ITSI could be used at institutional levels as a need assessment to measure faculty knowledge and skills regarding inclusive instructional practices (Dallas & Sprong, 2015; Lombardi et al., 2011a; Lombardi et al., 2011b). The adaptation of such tool can encourage the development of faculty inclusive instructional knowledge and skills, Saudi universities can examine faculty knowledge and practices on UDL practices, which would benefit universities' efforts in increasing their readiness including SWD across colleges and academic disciplines by preparing faculty members to teach a diverse group of learners. Further, the

ITSI can support deanships of academic development and centers of excellence in teaching and learning across Saudi universities in their efforts to develop training programs for faculty members, specifically, disability and inclusive training programs. This will assist at institutional and leadership levels that aim to adhere to the call of Authority for the care of Persons with Disabilities that emphasize increase enrollment of SWD and promote inclusive practices across universities.

Moreover, this study guide DSS centers at Saudi universities to elevate their roles from only providing accommodations for SWD, to providing adequate support for faculty members by offering workshops and training programs that support faculty members in their instructional practices, which will increase the students' curriculum accessibility. Explicitly, the DSS centers can use the ITSI to identify possible factors that may impact the experiences of SWD in classrooms.

Further studies are highly needed in this area, most of the Arabic literature that investigates issues pertaining college SWD in their institutions is in its early stage. Future research should consider expanding the scope of the study to cover a wider range of universities and share their findings to benefit all universities towards creating inclusive learning environments. It is crucial to get a deeper understanding of the faculty members' experiences about teaching SWD. Research studies should go beyond only examining the attitudes of including SWD at universities and immerse into the experience of faculty members teaching these students and the experiences of the students. Future researchers can examine the perspectives of SWD regarding the faculty inclusive practices using UDL principles (e.g. Gawronski et al., 2016). Moreover, future studies can utilize multiple methods to explore faculty inclusive instructional practices and determine factors that impact their instructional practices by employing mixed methods that pair the use of the ITSI and conducting focus groups of faculty members to gain additional understating of the faculty attitudes of the inclusive practices.

Conclusion

SWD are enrolled in Saudi universities in greater numbers. Moreover, Saudi leadership in higher institutions call for increasing accessible environments (e.g. facilities, web accessibility) and other materialistic items. Importantly, educational accessibility in classrooms is crucial to ensure students' success and prosperity in university contexts. Without such accessibility and support provided by their faculty members, SWD's degree completion could be jeopardized. Creating inclusive campuses through inclusive college classrooms and skilled faculty members teach a diverse group of learners is crucial. This study provides promising results that can guide the DSS efforts in supporting SWD and engaging faculty members with disability-related trainings and in inclusive instructional practices.

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