

Building Capacity to Deliver Sex Education to Individuals with Autism

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Abstract Professionals from a variety of fields are called upon to understand the needs of individuals with autism, advocate for services, and provide sexuality education, however few have formal training. This study examined a process to build capacity for individuals with autism to receive human sexuality education through training professionals via a 1 day workshop and providing ongoing education online. To better understand both the context for professionals and the outcomes of the training we examined the reasons participants attended, their work climate surrounding issues of human sexuality education for individuals with autism, the extent to which the training changed instructional behavior and perceptions of readiness, and the differential effectiveness of follow-up education based on online delivery modality (Facebook update or email message). Participants were interested in attending a training on human sexuality education even if they had no intention to teach this topic. In general, the climate among attendees was positive for teaching human sexuality education both in terms of their own values and their perceptions of support by others. The workshop and follow-up online education were effective for increasing instructional behavior and feelings of readiness.

Keywords Autism spectrum disorder · Human sexuality education · Online education · Professional development · United States

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Introduction

The topic of human sexuality education introduces a dialectic of abnormality and normality that is difficult to understand as concretely in other contexts. It is *normal* to feel different, embarrassed, and alone when learning about human sexuality and in doing so practitioners are able to empathize with the *otherness* that individuals with autism spectrum disorder (ASD) often experience in their daily lives. At the same time, within the context of human sexuality, individuals with ASD are experiencing a profoundly normal part of human development. Unfortunately, practitioners are not always prepared for individuals with ASD to be so *normal*: to develop sexual thoughts, feelings, and desires. Typically developing individuals often learn about human sexuality through a combination of three channels: parents, friends, and teachers. There are many barriers, however, to individuals with ASD accessing information from human sexuality from each of these channels.

The need for providing support to individuals with ASD in many areas such as social skills, daily living skills, and communication is widely recognized, however, the need for support in the area of comprehensive sexuality education remains controversial [1]. Early studies reported that individuals with ASD had no interest in intimate relationships with others [2, 3]. Additionally, there remain common myths that perpetuate the idea that individuals with ASD are asexual [4]. However, studies on sexuality in individuals with ASD, find that individuals do have a desire for intimate relationships [5–8]. Moreover, it is believed that sexuality education may both reduce inappropriate sexual behavior and be a protective factor against sexual abuse [9–13]. Parents may have a difficult time providing education at home. One parent focus group on sexuality and their children with ASD found that: (a) parents struggled with what healthy sexuality looked like in their children with ASD; (b) they believed their children's social impairments made many sexuality topics difficult to understand; (c) they perceived that the community did not understand the sexuality needs of their children; and (d) they saw themselves as unprepared to support their children with their sexuality needs [14].

Parents may have a difficult time talking to children with ASD about human sexuality and so may peers. ASD is defined by significant social communication deficits that must present in early childhood and impair daily functioning [15]. These deficits are defined in the areas of social-emotional reciprocity, non-verbal communication behaviors, and developing and maintaining relationships [15]. Social communication skills are key components of the expression of sexuality and also how people learn about sexuality; by virtue of their disability individuals with ASD are uniquely challenged when learning about sexuality concepts. Among the general population, sexuality is a topic often learned through informal channels but individuals with ASD have difficulty learning, especially learning informally about social relationships [13, 16]. For example, individuals with ASD may have difficulty understanding sexual humor, flirting, and conversations about sexual behavior. Because individuals with ASD may struggle with understanding the social context of their environment, typical avenues of sexual socialization may lead to misinformation or misunderstandings.

The difficulty of accessing information about human sexuality through informal channels suggests a need for formal sexuality education as an essential support for children on the spectrum. Most studies on human sexuality and ASD call for formal sexuality education [17]. Yet even when the need for comprehensive human sexuality education is acknowledged, the need often goes unmet. This may be due to lack of adequate teacher training and curriculum access.

Teachers vary greatly in the level of experience and training they have had with regard to teaching sexuality topics. There have been several studies that specifically examine special educator training. In a study of directors of special education teacher training programs throughout the nation, only 59 % report students receiving course work in sexuality education; this course work ranged from 3.6 to 20 h of class time [18]. Of 494 Florida special education teachers who served individuals with a moderate intellectual disability, most felt at least some comprehensive sexuality education topics were appropriate, but also reported delivering only a moderate amount of sexuality education [19]. In addition, the teachers reported their training to be inadequate. Moreover, teachers' own beliefs about what topics *should* be taught were a predictor of what they *actually* taught. Furthermore, teachers of children with ASD may perceive the sexual expression of children differently based on their general level of functioning. Kalyva [20] found that teachers perceived students with “low functioning Autism” to have more problematic sexual behavior; however, they expressed more concern for individuals with “high functioning Autism” regarding sexuality topics. The lack of training on teaching human sexuality education for special educators suggests that further professional development is needed. Furthermore, other professionals such as social workers, adult service providers, therapists, case managers also provide sexuality education, however, little is known about their experience with professional development on this topic.

Building Capacity to Deliver Human Sexuality Education

This study examined a process to build capacity for individuals with ASD to receive human sexuality education by providing professional development and resources to practitioners. Because of the barriers to traditional avenues of learning about sexuality, we anticipated that educators may be interested in receiving training in this area using alternative methods. Given the marginality of the topic, we were also interested in the climate surrounding human sexuality education for individuals with ASD. Finally we evaluated a professional development program on how to teach human sexuality to individuals with ASD that incorporated follow-up support using technology. For this study, we utilized a pretest posttest design with random assignment between two treatment conditions. All participants attended a 1 day workshop and data were collected from participants via an online survey before they participated and again one month after the workshop. During the interim, participants were randomly assigned to receive Facebook or email updates that included additional information about teaching human sexuality to individuals with ASD via a link to a website: asdsexed.org [21]. Specifically we asked

- For what reasons did the professional attend the training?
- What is the climate for providing sexuality education?
- Can professional development improve instructional behavior and practitioner readiness?
- Are online follow ups more effective when delivered through Facebook or email?

Face-to-Face Program: The Birds and the Bees

Due to the individualized nature of teaching human sexuality to individuals with ASD, *The Birds and the Bees* program attempted to address teaching human sexuality generally as opposed to how to teach a certain type of curriculum. *The Birds and the Bees* was based on a transformative learning process. Mezirow [22] explains that in a transformative process

of learning: a person feels disoriented, examines her or his thoughts and feelings, critically examines her or his internalized role, relates to others, explores options for new ways of acting, builds competence in new roles, plans a new course, acquires skills necessary to achieve this course and then participates in society within this new role. This transformative learning experience highlights the connection between paradigms and behavior through a series of conscious steps. Transformative learning is *instrumental* and *communicative*, meaning it centers on task oriented problem solving and understanding the meaning of others [23]. Transformative learning has been utilized and examined in the context of professional development and is specifically useful for training educators on how to implement sexuality education. King [24] found that educators became more open-minded towards others and themselves, developed a reflective orientation, and understood students better after undergoing a transformative learning experience. These outcomes are especially critical for education around sensitive topics. Trimble [25] suggests that sex education should be a transformative learning experience for adolescents and adults. Previous suggestions for sex education for individuals with ASD focus on concrete knowledge acquisition [26] but not necessarily how to tackle the nuanced aspects of sexuality and structuring the process of reflection. Pietrykowski's [27] examination of power and knowledge is especially relevant to educators working with individuals with ASD; if educators are seen as sexual experts holding all the sexual knowledge, individuals with ASD may be less inclined take ownership over their own sexual autonomy. Furthermore, educators who are not engaged in a similar transformative process may not be able to connect with individuals with ASD in a way that is relevant [28]. Thus, both utilizing transformative learning method and modeling a transformative experience is critical for teaching professionals to deliver sex education. This is what *The Birds and the Bees* sought to do.

The Birds and the Bees introduced comprehensive sexuality education (as consistent with SIECUS guidelines), attempted to broaden educator attitudes, teach practical strategies for instruction, and stimulate problem solving about difficult situations with regard to areas of sexuality for students with ASD. The workshop provided content and models for teaching comprehensive sexuality education, linked educators to additional resources, and facilitated educators' exploration of their own values and experiences related to sexuality education. Over an hour of the 7 h workshop was dedicated to examining educators' own thoughts and feelings related to disability and sexuality. Additionally several hours of the workshop focused on skills related to participants' roles as sexuality educators such as lesson planning, instructional methods, and background information. Participants spent time planning how they would use these skills in the future. The workshop was *instrumental* in that participants were required to solve specific solutions such as one small group activity where participants were asked to utilize behavior change theories to plan support around a sexual challenging situation (e.g. plan how you would respond if you were working with someone who does not understand why he gets in trouble for staring at his female classmate when the student insists "it is not hurting her"). The workshop was *communicative* in that participants were engaged with understanding the meaning of others, such as when they had to explain why someone might agree with a value statement that they themselves disagreed with. In short, the workshop was designed to start educators down the road of developing expertise in the area of human sexuality education with the understanding that doing it well requires a complex skill set. A 1 day workshop has limited scope; however, if teachers are inspired to start developing expertise independently, the impact of the workshop can increase exponentially through non-formal learning experiences [29].

Online Program: Asdsexed.Org

As in many areas, resources for enhancing sexuality education are limited. Creating effective educators requires programmatic support that can change complicated behaviors in a limited amount of time with a limited amount of resources. This, coupled with technological innovations, has opened the door to online learning including the area of professional development. The online presence had three forms: website, Facebook, and email. The website served as a library in which educators could access educational resources. This study examined two common online mediums that both offer the opportunity to connect with participants outside the face-to-face workshop: email and Facebook. Both of these mediums provide the opportunity to create an online learning community, “a learning atmosphere, a context providing a supportive system from which sustainable learning processes are gained through a dialogue and collaborative construction of knowledge by acquiring, generating, analyzing, and structuring information” [30]. Although email and Facebook provide an opportunity for an online learning community, Facebook enables one that is more consistent with the idea of a transformative learning experience. On Facebook, participants theoretically have more opportunity to participate in role exploration within their social networks by virtue of an individual’s network having access to information shared via Facebook. For example, one’s “friends” will be able to see that you “like” a page associated with teaching sexuality; this is consistent with Mezirow’s [22] idea of participating in society under a new role.

For the online treatment conditions, participants either received an email or Facebook updates. Both updates informed participants of recent developments in sexuality education, places to find additional resources, and tools for teaching human sexuality. All updates were in the form of recent posts to the website (which were controlled during the experiment). Due to the differences in best practices for email and Facebook delivery, although the content was the same, the timing was slightly different for each condition. In the Facebook condition, there were three posts during the week delivering content.¹ These updates were typically on Mondays, Wednesdays, and Fridays in the late afternoon unless there were holidays on these days (Fig. 1). In the email condition, participants received one email each week with three pieces of information.² These emails were typically sent on Fridays in the late afternoon (Fig. 2).

Methodology

Participants

Participants were recruited from the approximately 300 individuals who registered for *The Birds and the Bees* workshop on teaching human sexuality to individuals with special needs. The workshop was hosted by The Autism Program of Illinois (TAP), a state wide initiative to address the needs of individuals with ASD and their families. TAP facilitates relationships between 27 agencies and universities, and also sponsors five training centers. The *Birds and the Bees* workshops were conducted at eight of the TAP centers in 2012.

¹ Facebook recommends posting about once per day, but due to the limited resources of this project posting was limited to 3 days per week [31].

² We used a plain text email, however, we did consult with MailChimp email marketing plan guidelines [32].

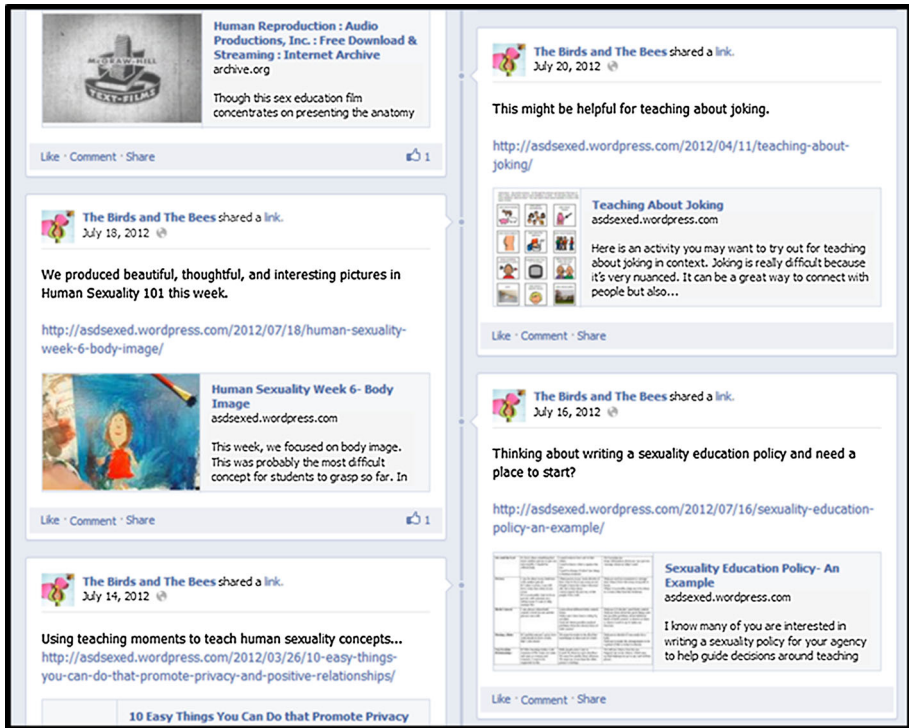


Fig. 1 Example of weekly Facebook posts

When participants registered for the program, they were invited to participate in the study. In order to participate, respondents were required to use email, use Facebook, and work with individuals with ASD. The invitation received 59 responses, all of whom were then sent a link to the pretest survey, and were randomly assigned to one of the two ongoing support conditions; 55 individuals completed the first survey; and 43 individuals completed the second survey ($n = 21$ email group, $n = 22$ Facebook group).

Special educators are required by the Illinois Board of Special Education (IBSE) to receive continuing education units (CEU) in order to show they are maintaining professional development throughout the year and other professions require similar continuing education. Several types of continuing education credits were issued for any individuals participating in *The Birds and the Bees* workshop. TAP charged \$20 for the workshop, which included lunch and CEUs. Participants who completed the pretest and posttest received a \$20 Amazon gift card as an incentive.

Participants ranged in age from 23 to 61 ($M = 38.21$, $SD = 10.82$). Most (87 %) of participants were female (1 participant did not answer). Participants held a variety of professions (Table 1). Participants varied on whether they were teaching or planned to teach human sexuality education to individuals with ASD.

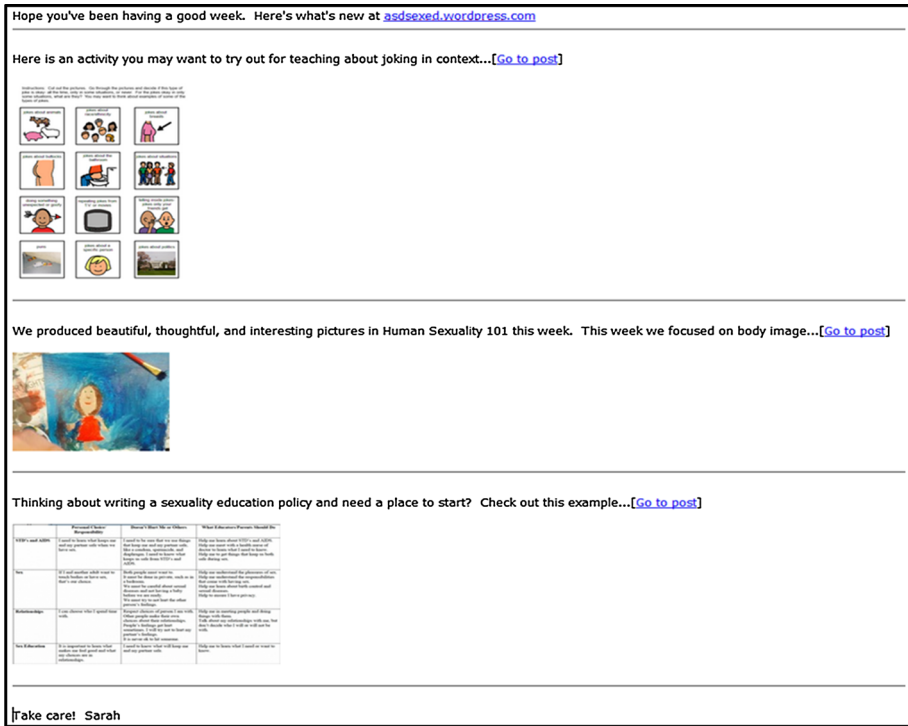


Fig. 2 Example of a weekly email post

Table 1 Participant professions and reason for attending

	n	Teaching	Planning to teach	Not planning	Percent of total (%)
Social worker	17	4	6	7	31.5
Adult service provider	14	4	4	6	25.9
Special educator	9	3	5	1	16.7
Nurse	3		1	2	5.6
Case manager	3			2	5.6
Specialized therapist	3		1	3	5.6
Student	2	1	1		3.7
Parent	2		2		3.7
Staff trainer	1		1		1.9
Not answered	1				1.9
Total	55	12 (21.8 %)	21 (38.2 %)	21 (38.2 %)	

Measures

Data were collected in four domains via self-report online questionnaire: participant background, instructional climate, program outcomes, and online content satisfaction. There is a lack of reliable and valid sexuality measures, especially with regards to normative sexual experience and behavior. Many measurements of sexual knowledge, values,

and behavior have been designed to be used with special populations such as with perpetrators of sexual violence, victims of sexual violence, or individuals with HIV or AIDs [33]. For this reason a tool was developed to specifically target the goals of *The Birds and the Bees* when no reliable measures could be found. The entire measurement tool underwent a cognitive interview process to reduce social cognitive problems with survey design. A cognitive interview is a process of assessing if the perceived meaning of the questions are consistent with intended meaning by asking interviewees to think out loud as they are answering [34]. The measurement tool was also reviewed by experts on teaching human sexuality to individuals with ASD. Overall, both experts found the tool to be valid and comprehensive; their suggestions were included in the final revision of the assessment tool.

Participant Background

Participants were asked about their profession (e.g. teacher, social worker, aide, etc.), gender, intention to teach (e.g. currently teaching, planning on teaching, or not intending on teaching), and reasons for participating in the workshop.

Instructional Climate

Instructional climate was assessed in several ways: banned topics, policy, support for education, endorsement of SIECUS content, need for education, values, strengths, and challenges.

Banned Topics and Policy Participants were asked which of the 39 SIECUS topics were *banned topics* at their place of employment via a multiple response item. They were also asked if there was a *sexuality policy* at their place of employment via a multiple choice item.

Support for Education Participants were asked about *support for teaching sexuality education* via 3 items on a five point scale ranging from strongly disagree to strongly agree with an additional “don’t know” option: “My administration/organization is supportive of teaching sexuality education to individuals with ASD”, “Individuals with ASD are interested in sexuality education”, and “Parents seem supportive of their children with ASD receiving sexuality education”.

Endorsement of SIECUS Content Participants were asked about the *endorsement of SIECUS content*. For each of the 39 SIECUS topics they were asked “How important to you is each of the human sexuality content areas listed below when teaching individuals with ASD?” They could answer on a six point scale from extremely unimportant to extremely important. Cronbach’s α s for the total scale were .94 (pretest) and .94 (posttest).

Need for Education Participants were asked about *need for sexuality education* via a four item scale with a possible range of scores from 1, extremely unimportant to 6 extremely important with an additional not applicable option. The scale asked about sexual

exploitation, right to information, sexually inappropriate behavior, and facilitating intimate relationships. Cronbach's α s for the total scale were .92 (pretest) and .86 (posttest). Participants were also asked about the need for sexuality education via an open ended item: "why do you think individuals with ASD need education about human sexuality?"

Values Respondents were asked to rate how much they agreed or disagreed with 21 items adapted from *SEICUS values on sexuality*. For example, "For individuals with ASD, sexuality is a natural and healthy part of living." Items were rated on a five point scale from strongly disagree to strongly agree.

To look for potential subscales we performed an exploratory factor analysis using principle components extraction with varimax rotation on the 21 values items. Factor analysis was performed on the pretest data as the training experience may have altered participant values. Missing data were eliminated listwise. The KMO for the 21 values items was .79 and deemed appropriate for interpretation. Results indicated a 5-factor solution that explained 74 % of the total variance in values towards sexuality and individuals with ASD. Two factors were dropped because three items cross-loaded onto different factors with similar magnitude and two of the five factors only had one or two items (full results of the factor analysis are available from the author upon request). Three factors of sexuality values and individuals with ASD were created. These factors were called *core values* (7 items: e.g. people with ASD have dignity and self-worth), *sexual expression* (6 items: e.g. people with ASD have the right to make responsible sexual choices), and *traditional values* (4 items: e.g. parents should be the primary human sexuality educators of their children with ASD) based on the themes represented in the items. Each of the subscales represents a dimension of the values inherent to the training experience. Cronbach's α s for the subscales were .93, .84, and .77 respectively.

Strengths and Challenges Participants were asked about the *strengths and challenges* individuals with ASD may have when learning about sexuality topics via an open-ended item: "please list several strengths you see student with ASD bringing to classes about human sexuality" and "what are some challenges to teaching human sexuality to individuals with ASD?"

Program Outcomes

Program outcomes were assessed in terms of developing expertise and readiness to teach. Developing expertise had four domains. Respondents were asked "In the past month, how often have you engaged in each of following activities in regards to human sexuality and individuals with ASD?" Items covered topics such as (1) *knowledge seeking* (5 items, Cronbach's $\alpha = .87$ pretest and .76 posttest), (2) *collaborating* (5 items, Cronbach's $\alpha = .94$ pretest and .93 posttest), (3) *utilizing curriculum* (3 items, Cronbach's $\alpha = .91$ pretest and .95 posttest), and (4) *advocacy* (4 items, Cronbach's $\alpha = .86$ pretest and .83 posttest). Items were rated on a five point scale with the options never, rarely, sometimes, frequently, and very often. *Readiness to teach sexuality* was assessed by asking participants about the degree to which they felt ready to teach human sexuality to individuals with ASD on a five point scale from strongly disagree to strongly agree. Two items on the scale were reversed coded. Cronbach's α s were .84 for the pretest and .79 for the posttest. Participants also gave open-ended feedback of the workshop experience.

Online Content Use

Three items were used to assess *satisfaction with the online component* of the training experience. The first item asked, “During the past month, you received Facebook [email] updates with information about teaching human sexuality. How often did you read these messages?” on a five point scale with answers ranging from never to always. The second item asked, “How often did you click on the link in Facebook [email] to view additional information online?” on a five point scale with options ranging from never to always. The third item asked, “In general, how useful were the Facebook [email] updates?” on a five point scale with items ranging from very un-useful to very useful.

Analysis

To answer the first and second research questions, “Who is interested in learning about human sexuality education?” and “What is the climate for providing sexuality education?”, we performed a descriptive analysis. Open ended questions were coded thematically. The data from the pretest ($n = 55$) were used to answer these research questions. To answer the second and third research questions, “What are the outcomes of face-to-face training and online, ongoing support in terms of changes in attitudes, values, and the degree to which participants spend more time participating in professional development activities?” and “How are outcomes moderated by how ongoing support was delivered (i.e., email versus Facebook)?” we conducted two sets of analysis. The preliminary analysis looked at Chi-square and t-tests for all pretest comparison groups and correlates between scales. The secondary analysis consisted of a series of repeated measure ANOVAs with type of online support as a between-subjects factor. Data that were missing were excluded listwise. Only participants for whom we had pretest and posttest data were included ($n = 43$).

Results

Reasons for Attending the Training

There were many reasons participants were interested in attending the training. Twelve participants (21.8 %) were currently teaching human sexuality to individuals with ASD in some capacity. These participants often cited professional development or wanting to learn more ($n = 7$). Sometimes they simply explained their profession such as, “I am a school social worker for students with Autism” ($n = 3$). One participant indicated that they were attending the training to see if it would be beneficial to bring to the agency. Twenty-one participants (38.2 %) were planning on teaching in the future. Many responded that they wanted to improve their skills or that they thought the training would help in some way ($n = 14$). Several participants had a specific situation in mind such as “[we] have had an incident of ‘bad touch’” ($n = 4$). One participant cited no previous training, one wanted to set up a curriculum for a life skills class, and one attended to receive CEUs. Twenty-one participants (38.2 %) did not plan on teaching. Most of these participants thought the information would be helpful or to learn about the topic ($n = 7$) and several were motivated by CEUs ($n = 4$). Two wanted to be able to guide others (e.g. parents) and two wanted to be able to answer sexual questions that individuals with ASD raise. One

participant was dealing with issues of “hypersexuality”, one wanted to better serve individuals who may be sexually abused, and one participant came because his or her boss thought it was a good idea.

Instructional Climate

This section describes the climate in the previous month as related to teaching human sexuality to individuals with ASD in terms of banned topics, policy, support for education, endorsement of SIECUS content, need for education, values, and strengths and weaknesses.

Banned Topics and Policy

Very few respondents ($n = 4$) reported that topics were banned from being taught. The topics that were banned included reproduction, sexual orientation, gender identity, masturbation, shared sexual behavior, human sexual response, sexual fantasy, sexual dysfunction, contraception, and abortion. If a participant mentioned that a topic was banned they were likely to mention that several other topics were banned as well. Eleven participants (20.0 %) reported that there was a sexuality policy where they worked; 28 participants (50.9 %) reported that there was not a policy; 15 participants (27.3 %) did not know.

Support for Education

When rated on a five point scale from strongly disagree to strongly agree most participants thought there was administrative or organizational support for teaching human sexuality ($M = 4.15$, $SD = .82$), that individuals with ASD were supportive of human sexuality education ($M = 3.84$, $SD = .73$), and that parents were supportive of sexuality education ($M = 3.36$, $SD = 1.01$).

Endorsement of SIECUS Content

Respondents generally endorsed SIECUS recommend educational content across all content areas; on a six point scale regarding “how important to you is each of the human sexuality content areas listed below when teaching individuals with ASD” from extremely unimportant to extremely important the mean response was 4.72 ($SD = .66$). However, there was variation across content areas, with some topics being perceived as less important than others (see Table 2).

Need for Education

In terms of why individuals need sexuality education, respondents saw risk as a key factor ($M = 5.21$, $SD = 1.24$ on a six point scale); that individuals have a right to the information ($M = 4.89$, $SD = 1.25$), to prevent sexually inappropriate behavior ($M = 4.96$, $SD = 1.21$), and because individuals need pro-social skills ($M = 4.79$, $SD = 1.32$).

Participants were also asked why they thought education was necessary via an open ended question (this was asked before the close ended version). As participants often had several reasons, the question yielded 72 unique responses, 69 of which could be coded. The

Table 2 Mean and standard deviations of SIECUS topics by order of perceived importance

Topic	Mean	SD
Communication	5.41	.63
Sexual abuse, assault, violence and harassment	5.41	.98
Help seeking	5.35	.85
Decision making	5.30	.82
Contraception	5.20	.88
Friendship	5.17	.82
Understanding own values	5.13	.91
Sexuality transmitted diseases	5.13	.97
HIV and AIDS	5.11	.97
Assertiveness	5.08	.83
Love	5.04	.85
Romantic relationships and dating	5.04	.95
Families	5.02	.88
Negotiation	4.96	.91
Puberty	4.91	.90
Masturbation	4.87	.86
Shared sexual behavior (sexual behavior with another person)	4.83	.95
Reproductive health	4.83	1.10
Pregnancy and prenatal care	4.80	1.11
Marriage and lifetime commitments	4.72	.98
Sexuality throughout life	4.70	.88
Sexuality and the law	4.69	.93
Body image	4.67	.80
Sexuality and society	4.67	.87
Reproduction	4.66	.78
Raising children	4.61	1.14
Reproductive and sexual anatomy and physiology	4.48	.82
Abortion	4.46	1.02
Sexual abstinence	4.44	.90
Human sexual response	4.41	.90
Gender identity	4.41	.92
Diversity (of sexual attitudes and behaviors, discrimination)	4.39	.92
Sexual orientation	4.35	.87
Sexuality and the media	4.28	.90
Gender roles	4.26	.96
Sexual dysfunction	4.02	1.06
Sexuality and the arts	3.96	.98
Sexuality and religion	3.96	1.03
Sexual fantasy	3.94	1.02

universality for education on human sexuality was cited 21 times (30.4 %). *Universality* was expressed in such terms as “I think everyone needs education about human sexuality.” The *unique struggles* of individuals with ASD was also a common response (n = 19,

27.5 %). Unique struggles were presented in terms of the extra support individuals with ASD often need surrounding issues of sexuality, “People with ASD have a much harder time trying to navigate their way through this part of their world.” There were several times when the universality for the need of human sexuality education and the unique struggles for individuals with ASD were listed together ($n = 8$) implying a need for specialized or adapted instruction. Participants were concerned about issues of *safety* and cited it as a reason for needing education ($n = 12$, 17.4 %). Sometimes this regarded individuals with ASD as potential perpetrators, victims, or both, “Furthermore, individuals with ASD often do not have an understanding of what is socially appropriate—this can put them at risk to be sexual victims or aggressors.” Eleven responses (15.9 %) acknowledged at least some aspect of individuals with ASD as *sexual beings* yet were not explicit in the universality of human sexuality education, “Because they need to understand what is happening to their bodies and the feelings that they get.” Several responses ($n = 5$, 7.2 %) were centered on individuals with ASD being *excluded* from human sexuality education, “Because most likely they have never been taught about human sexuality before, either through fear or the belief that they don’t need to know about human sexuality...” One response (1.5 %) acknowledged the need but also included a *caveat*, “Those with ASD have a right to education about human sexuality if it is appropriate for them.”

Values

The mean rating for agreement with SIECUS value statements was 4.18 ($SD = .52$) on a five point scale. Examination of the three subscales showed more agreement with core values ($M = 4.54$, $SD = .72$), followed by sexual expression ($M = 4.27$, $SD = .67$), and then traditional values ($M = 3.70$, $SD = .71$).

Strengths and Challenges

Respondents were asked to, “Please list several strengths you see students with ASD bringing to classes about human sexuality.” Less than half of the respondents ($n = 23$) answered the question yielding 34 unique responses, 31 of which could be coded (summarized in Table 3). Participants reported individuals with ASD were frank, willing to learn, good students, want boundaries, have more “basic” needs, and not superficial. Participants were also asked, “What are some challenges to teaching human sexuality to individuals with ASD?” Thirty-four participants answered yielding 54 unique responses (summarized in Table 3). Challenges included impairments of students with ASD, concreteness of individuals with ASD, their own lack of expertise, inadequate teaching environments, support for providing education, the ability for individuals with ASD to generalize information to different contexts, and the stigma that individuals with ASD experience regarding sexuality.

Effectiveness of the Training Experience

This section examines outcomes related to the training experience and differences in those outcomes by type of update received. The first set of results examines demographic differences between email and Facebook groups based on the preliminary analysis. The second set of results reflect the repeated measure ANOVAs with type of online support as a between-subjects factor. 43 participants responded to the posttest.

Table 3 Strengths individuals with ASD bring to classes about human sexuality and teaching challenges

Response	N	Example
Strengths		
Frankness	9	“Students with ASD tend to not think of the topic as taboo or be embarrassed to talk about it”
Willingness to learn	8	“This seems to be a topic that is important to them and in turn they may be more motivated to learn about it”
Good student	7	“Keeps appointments” and “ask questions”
Want boundaries	3	“It is important to them that they do things well, include behave appropriately in social contexts”
Basic	3	“Their sexual needs are very basic and have not been complicated through social pressures and cues”
Not superficial	1	“I think they would be less concerned with the looks of a person. They might be more concerned with the kindness of the person and how they act”
Challenges		
Impairments	27	Impairments were sited in cognitive (n = 9), communication (n = 7), Socio-emotional (n = 6), developmental (n = 4), and sensory (n = 1) domains
Concrete	7	“it is hard to explain the concepts in a simplified, concrete manner”
Lack of expertise	8	“Currently our challenge with getting started is my lack of knowledge on how to teach it”
Teaching environment	4	“Appropriate environment” and “group size”
Support	4	“Some challenges include parents/families who hold certain beliefs about what is acceptable to teach in regards to sexuality”
Generalizability	3	“I find it very challenging for individuals to put into action what we talk about in our sessions”
Stigma	1	“I have had a client in the past get into trouble at college where he was “flirting” with a female though she felt he was a threat”

Comparison of Groups

The preliminary analyses used the pretest data with t-tests and Chi-square tests to look for differences among comparison groups by demographics. There was one significant difference between the email and Facebook groups ($\chi^2 = 13.32$, 2 degrees of freedom, $p < .001$) in terms of teaching status and intention. Participants in the email condition were much more likely to not plan to teach sexuality to individuals with ASD whereas participants in the Facebook condition were much more likely to plan on teaching human sexuality in the future. The preliminary analysis also examined inter correlations of key study variables (at posttest) to see whether or not a positive correlation between instructional behavior, values, or use of online content was observed in this sample (Table 4).

Only significant relations are described. Each of the instructional behaviors (*knowledge seeking, collaborating, utilizing curriculum, advocacy, and readiness*) were positively correlated with one another. There were also relations between the three values subscales. *Core values* was positively correlated with *sexual expression*, but not *traditional values*. *Sexual expression* was positively correlated with *traditional values*. There were relations between the items related to online content use. *Reading updates* was correlated with clicking the link to additional content. There were relations between instructional behavior,

Table 4 Inter correlations of key study variables at posttest

	1	2	3	4	5	6	7	8	9	10	11
1. Knowledge		.69***	.65***	.69***	.45**	.12	-.18	-.32*	.31*	.35*	.08
2. Collaborating			.85***	.62***	.47**	-.10	-.10	-.41**	.04	.12	.04
3. Curriculum				.74***	.46**	-.05	-.22	-.24	.06	.08	.26
4. Advocacy					.52***	-.01	-.27	-.21	.12	.24	.35*
5. Readiness						.06	.02	-.30	-.14	.03	.03
6. Core values							.55***	.01	.04	.08	-.19
7. Expression								.36*	-.24	-.25	-.23
8. Traditional									-.06	-.29	.09
9. Read updates										.66***	.15
10. Clicked on											.16
11. Found useful											

* $p < .05$; ** $p < .01$; *** $p < .001$

values, and online content use. *Knowledge seeking* and *collaborating* were negatively correlated with *traditional values*. *Knowledge seeking* was positively correlated with *reading updates* and clicking the link. *Advocacy* was positively correlated with finding online updates useful.

Program Outcomes

We present the pretest and posttest means for all outcome variables in Table 5 below. We conducted paired t-tests to examine differences in the means between the pretests and posttests, and calculated the correlation between pretest and posttests for each outcome measure. The t-tests showed significant increases on *knowledge seeking*, *collaborating*, and *readiness*. There were high correlations between measures at pretest and posttest; the correlations for those measures showing significant change were especially high. The correlations between pretest and posttest indicate that relative ordering of individuals at each measure was quite high.

Next we tested whether being in the email or Facebook group moderated any changes between pretest and posttest. Table 6 summarizes the results of the repeated measures ANOVAs for values and instructional behavior that used time as the within subjects factor and type of online group as the between subjects factor. None of the main effects for type of group were significant, nor were any interactions between time and type of group.

Instruction

We did not expect that the workshop would increase instruction and did not find an indication that it did. A paired sample T-test indicated there was no significant difference between mean time teaching at pretest and posttest. Repeated measures ANOVA with intention as a between subjects factor was also used to indicate if there was a difference in time spent teaching depending on intention to teach and there were no significant mean differences.

Feedback from Participants

All 43 respondents provided feedback and the overwhelming response was positive; 42 respondents listed at least one positive comment. The comments were generally related to the experience of attending the workshop ($n = 17$) such as, “I loved it! It was very interesting and you definitely kept things interesting and moving!” Many participants ($n = 17$) mentioned something specifically related to knowledge seeking by mentioning the information and resources presented such as, “I enjoyed the workshop. I felt that there was a lot of information that was helpful for all in attendance.” The opportunity to

Table 5 Outcome means and standard deviations at pretest and posttest, correlations, and paired samples T-tests

	Pretest		Posttest		T-test	r^2
	M	SD	M	SD		
Knowledge seeking	1.64	.79	2.18	.70	-5.49***	.66***
collaborating	2.00	1.04	2.27	.96	-2.34*	.73***
Utilizing curriculum	1.82	1.14	2.16	1.33	-1.95	.60***
Advocacy	2.04	.98	2.16	1.03	-.80	.53***
Readiness	2.48	.75	2.94	.64	-4.86***	.62***

* $p < .05$; *** $p < .001$

Table 6 Descriptive statistics and summary of program outcomes from repeated measures ANOVA with online delivery method as a between subjects factor

	Within	Between	Interaction	η^2
Knowledge seeking	29.98***	2.74	2.91 [†]	.44
Collaborating	5.20*	.42	.14	.12
Utilizing curriculum	3.67 [†]	1.31	.00	
Advocacy	.74	.05	.88	
Readiness	22.72***	.29	.67	.37

* $p < .05$; *** $p < .001$. [†] Indicates the variable is approaching significance ($p < .10$). η^2 s are reported for the within-subjects main effects, time. There were no significant interactions between time and delivery method

collaborate was also mentioned ($n = 6$), “I enjoyed having a refresher course and the interactions with other providers. It’s nice to have different perspectives and philosophies shared.” Two respondents specifically mentioned utilizing curriculum, “Loved the workshop, especially doing some of the activities. It helped me think of ways I could incorporate the activity or something similar in my education sessions.” No respondents specifically mentioned anything related to advocacy. Critiques were offered ($n = 8$). More specifics may have been helpful ($n = 4$) “Was hoping for more specific info on ASD common behaviors and how to remedy them.” Several participants ($n = 3$) did not feel the material was applicable to their students, “It was good but I work with very low functioning kids and found it difficult to apply a lot of what we went over to my students.” One participant suggested tailoring the workshop for different levels of expertise.

Online Ongoing Support

There were no differences between the email and Facebook groups on any of the outcome variables though *Knowledge seeking* approached significance. Although the conditions were randomly assigned, the groups differed on one characteristic: the majority of the participants in the email condition did not intend to teach human sexuality to individuals with ASD ($N = 14$) whereas the majority of the individuals in the Facebook condition did ($N = 12$). However, using intention as a between group factor was not significant on any of the outcomes. Individuals in the email condition did report reading the messages more and found the updates to be more useful (see Table 7).

Discussion

As we predicted, those interested in learning more about how to teach human sexuality to individuals with ASD came from a variety of different professional backgrounds. Practitioners from various professions were teaching or intending to teach, but many participants attended with no intention to teach. That over a third of participants had other motivations besides direct instruction may indicate an awareness that when supporting individuals with disabilities it is important to understand them as a whole person including as a sexual person. This is also supported by the data indicating a fairly positive climate for teaching human sexuality to individuals with ASD: (1) there were few respondents reporting banned

Table 7 Summary of Email and Facebook use

	<i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>P</i>
Read message		2.41	39.00	<.05
Email	4.05 (.91)			
Facebook	3.14 (1.42)			
Clicked link		1.87	38.00	>.05
Email	3.17 (1.20)			
Facebook	2.41 (1.33)			
Found useful		2.37	38.00	<.05
Email	3.84 (.69)			
Facebook	3.14 (1.11)			

topics, (2) at least some participants had knowledge of existing policy in their place of employment, (3) they perceived support especially from the administration at their place of employment, (4) they endorsed comprehensive sexuality topics as being important for individuals with ASD, (5) they could independently articulate the need for human sexuality education, (6) their values were consistent with values inherent to teaching comprehensive sexuality education, and (7) many participants were able to see strengths that individuals with ASD bring to classes on human sexuality.

Despite a seemingly positive climate, only twelve of the participants were actually providing human sexuality education to individuals with ASD. Furthermore, at the one month post-test, although participants did show greater efforts in terms of knowledge seeking and collaborating as well feeling more ready to teach, they did not report that they were actually providing more human sexuality education. The strengths and challenges respondents offered may give some insight as to why this is the case. There seemed to be deficit oriented thinking regarding individuals with ASD. The challenges also indicated deficit oriented thinking. Most of the responses were in regards to challenges posed by individuals with ASD as opposed to structural, personal, or institutional challenges. Furthermore, some of the impairments cited pose genuine difficulties, but the perception of these impairments maybe creating barriers rather than the impairments themselves. This is evident in some responses regarding program feedback. Some participants could not see how the content could be used with individuals with intellectual impairments despite the fact the content was coming directly from instruction.

Further research could explore the challenges to teaching sexuality education and how educators have successfully overcome these challenges. Specifically, future research could examine the role of transformative learning in sexuality education programs for individuals with ASD. The Birds and the Bees modeled a transformative learning experience. The implication was that educators should provide sexuality education to individuals with ASD through a transformative learning experience as well. It may be that educators do not entirely believe that individuals with ASD are capable of such an experience. There is very little empirical evidence of which teaching methods are the most successful for teaching individuals with ASD about human sexuality.

In addition to providing information regarding who is providing sexuality education and the climate for providing it, this study also evaluated professional development outside the school context. Most previous research only looked at special educator training, but other practitioners are often called upon to provide these resources. Although providing sexuality education within schools is important, until the structural barriers limiting classroom based

sexuality education is addressed, other avenues, such as community based service providers, may be able to fill the need for sexuality education. This study indicated that a relatively low intensity training opportunity could prepare practitioners from diverse professions in becoming sexuality educators. Specifically, participants felt more ready to teach human sexuality, were taking steps to increase their knowledge on sexuality topics above and beyond the workshop, and were collaborating around issues of sexuality instruction for individuals with ASD. The workshop and ongoing support were specifically targeting knowledge seeking behavior so it is reasonable that there would be change in this domain. Collaborating was not specifically targeted, however collaborating behaviors were modeled throughout the workshop. In terms of readiness, perceptions of readiness may predict future instruction. Participants may have felt more ready due to their own knowledge seeking efforts. Future research could look more long term to see if these outcomes lead to an increased likelihood of delivering sexuality education over time.

Additionally, future research could explore the connection between values and teaching behaviors in long term follow ups. This study showed there was a relation between values and behavior in both predictable and unpredictable ways. For example, we expected that reading updates that were sent electronically would be correlated with clicking the link to additional content as the link is embedded in the update. Unexpectedly, *traditional values* had a negative correlation with *knowledge seeking* and *collaborating*, despite these values being consistent with the underlying values of comprehensive sexuality education. It may be that an emphasis on the role of parents in human sexuality education and abstinence reduces instructional behavior. Additionally, it is unclear why advocacy would relate to finding online updates useful. It may be that the content, in addition to being educational, could be used to advocate with administrators, parents, and self-advocates.

There were no significant differences in terms of the interactions with treatment conditions, however, participants did engage differently with the online content depending on the delivery method. Recently much attention has been paid to the importance of social media, but in this study, participants receiving email updates were more likely to engage with additional content. This suggests email may be a more effective avenue for delivering educational content, however in this study, the modality did not affect any other outcomes. We expected the Facebook updates would be most congruent with a transformative learning experience and therefore more effective but there was no evidence that this was the case. Even if the Facebook updates were more effective, if participants are not seeing them, they have less of a chance of making an impact. Alternatively, it may be that although email may be less consistent with our theoretical model, it is still a good tool for disseminating information. This idea is consistent with data from The Pew Internet and American Life Project which suggested that email at work can make it easier for workers to keep current [35]. This study did not have a comparison group so there was no way to examine the role of ongoing online support in overall program outcomes. There was indirect evidence that the online support was beneficial; one of the significant outcomes was increased knowledge seeking. This behavior could have been directly facilitated by the online component of the training which provided opportunities to expand the knowledge base.

In this study, we examined the current capacity for teaching individuals with ASD about sexuality, the outcomes of a transformative learning experience, and how differences in online delivery methods moderated the effects of a face-to-face learning experience. Program developers are increasingly being held to rigorous standards of program effectiveness [36]. Although there is still much work to be done in this area, this is one of the first studies that has examined how to best train professionals in becoming sexuality

educators specifically to individuals with ASD. This research indicates that training practitioners from a variety of professions is appropriate and that the climate is somewhat favorable for instruction. It also indicates that modest professional development efforts can support practitioners in being more prepared to teach human sexuality to individuals with ASD but that a more significant intervention or more time may be necessary for actually providing additional instruction even beyond regular online updates of additional content. There are many components that must fall into place in order for individuals with ASD to receive human sexuality education. Agencies, school systems, parents, and individuals with ASD must support and put resources into sexuality education. Practitioners must be provided with training on how to teach sexuality topics, search out additional information, and adapt existing materials. Finally, sexuality education must be addressed across the service spectrum as traditional avenues, such as school based education, may be inaccessible to individuals with ASD.

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Compliance with Ethical Standards

Conflict of interest Neither Sarah L. Curtiss nor Aaron T. Ebata has a conflict of interest related to this study.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the internal review board at the University of Illinois #12424.

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