

Delivering School-Based Sexuality Education: Examining Determinants of Teachers' Intention To Teach, Co-Teach or Invite a Sexual Health Educator

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Abstract

Background

Schools need to collaborate with health network to actualize their important role in promoting sexual health among students. Studies focus on determinants of teacher's intention to deliver sexuality education (SE), but do not take into consideration the specificity of the action and the context, i.e., the multiple teaching strategies they could choose. Teachers can deliver SE by (a) teaching students alone, (b) co-teaching, (c) inviting a sexual health educator in their classroom. The purpose of this study is to investigate the psychosocial determinants of teachers' intention to deliver SE in any of those roles, using a theory-based approach.

Methods

Godin's (2012) health behavior change theoretical framework - an integrated version of Ajzen's planned behavior theoretical framework, Triandis's interpersonal behaviors, and Banduras's social cognitive theory - was used to measure teachers' intentions and determinants to do SE. A 66-minute online questionnaire was sent to teachers at a school service center in Quebec. Hierarchical logistic regression analyses were conducted to assess the relationship between the independent variables (determinants of intention) and the intention to teach alone SE, co-teach, or invite a sexual health educator.

Results

A total of 295 teachers from 51 elementary and 12 secondary schools were selected for analyses. Nearly 40% (39.9%) of the study participants had a favorable intention to teach SE alone to their students, 36.2% by co-teaching and 76.5% by inviting a sexual health educator. The main predictors of intention were respectively: a) for the teaching SE alone model ($R^2=58\%$): self-efficacy in sexual health education (OR = 6.07; $p < .001$), followed by moral norm (OR = 5.35; $p < .001$), descriptive norm (OR = 3.37; $p < .01$), comfort teaching the SE curriculum (OR = 3.09; $p < .01$), and past experience (OR = 2.89; $p < .01$). Age was also negatively associated with the outcome variable (OR = 0.92; $p < .001$). b) For the co-teaching model ($R^2=46\%$): moral norm (OR = 7.97; $p < .001$), followed by educational attainment (OR = 3.40; $p < .05$), teaching multi-age or multi-grade groups (OR = 2.36; $p < .05$), and self-efficacy with working in partnership (OR = 1.27; $p < .05$). Further, age (OR = .93; $p < .001$) and gender (OR = .44; $p < .05$) were negatively associated with the outcome variable. c) For the inviting sexual health educator model ($R^2=55\%$): moral norm (OR = 3.81; $p < .001$), followed by anticipated regret (OR = 2.45; $p < .05$), and descriptive norm (OR = 2.38; $p < .05$). Teachers who reported feeling comfortable teaching the SE curriculum (OR = .45; $p < .05$) were less likely to intend inviting a sexual health educator.

Conclusions

Results indicate that determinants of teacher intention are relatively distinct depending on whether teachers make the decision to teach SE to their students alone, co-teach, or invite a sexual health educator in their classroom. The study further suggests complementary strategies being adopted by schools to optimize implementation of SE program.

Contributions To The Literature:

- Healthcare networks need to collaborate with schools in health promotion approach to implement evidence-based sexuality education.
- There are remaining challenges to collaboration between sexual health educators like nurses and teachers. Teachers must be aware of sexual health promotion and be ready to implement the evidence-based program.
- This research is the first one to investigate determinants and intentions to deliver sexuality education of the most appropriate practitioners in health promotion at school (i.e. teachers) with a theory-based approach.
- Findings suggest implementation targets to bring about behaviour change to deliver effective sexuality education, including to teach alone, co-teach or to invite a sexual health educator in the classroom.

Background

Sexuality education (SE) in schools makes a fundamental contribution to young people's health and well-being. When based on scientific evidence, it can foster the development of interpersonal skills (e.g., emotional management), sexual health, well-being, and sexual fulfillment in addition to reducing social inequalities [1–9]. Moreover, by creating a safe environment, SE could promote students' educational success [10, 11].

Promotion of school-based sexual health necessitates collaborative practice between health organizations and schools. As the main sexual health educator at school, teacher plays a key role to implement and maintain SE evidence-based programs [12–17]. Teachers must, actually, actively engage with their health promotion role to ensure SE's effectiveness. However this role is greatly complicated by the integration of a health mandate in schools, the multidisciplinary nature of sexuality didactics, and the intimate nature of teaching sexual health [13, 18–24]. For instance, teachers often feel uncomfortable teaching several SE topics [20, 25], often leading them rely on sexual health educator as fellow colleagues or community members for instructional activities (e.g., sexual and gender diversity testimonials) [18, 26–28]. Health professionals working in a school environment (e.g., sexologists, psychologists, etc.) and in healthcare and social services (e.g., school nurses, community organizations working in reproductive health, HIV prevention, or in the prevention of violence against women and children, etc.) are thus called upon for their expertise. These calls to health professionals could be particularly pronounced when the type of expertise required is specialized or when the subject matter is sensitive in nature (e.g., sexual assault, sexual orientation, gender identity, abortion)[18].

Given the need for interprofessional coordination within schools as well as intersectoral coordination with healthcare services, teachers make an active decision about which strategy they wish to implement to deliver effective SE to their students: teaching it themselves, co-teaching, or invite a sexual health

educator in their classroom. Understanding the determinants of teachers' intention to deliver SE using one of these strategies is therefore critical for the implementation of evidence-based public health programs.

Theoretical background

The selected theoretical framework (Godin, 2012) [29] integrates Ajzen's [30] theory of planned behavior (TPB) and variables from Triandis' [31] theory of interpersonal behavior and from Bandura's [32] social cognitive theory. An integrative theoretical model makes sense for an interventional study, as it provides a comprehensive overview of the psychosocial determinants at play in decision-making relative to changes in professional practice [33]. Like TPB, Godin's integrative model posits that intention to perform a behavior is a direct determinant of the behavior. In this model, the primary determinants of intention are attitudes, norms, and one's perceived control relative to the given behavior. In cases where the behavior is not completely under the voluntary control of the individual, perceived behavioral control can be a direct predictor of intention. An attitude refers to the personal evaluation of the behavior's anticipated positive and negative outcomes, whereas a norm refers to the subjective evaluation of the pressure to perform the behavior, and others' expectations. Perceived control refers to the evaluation of one's personal abilities or capacities to perform the desired action in the presence of facilitating conditions or despite barriers. External variables (e.g., individual characteristics) indirectly influence behavioral intention, whereas past experience directly influences behavior or moderates the relationship between intention and behavior. The model plans to study indirect rather than direct measures of attitudes, norms, and perceived control, since an intervention on these indirect measures (e.g., underlying beliefs, etc.) is required to change behavioral intention [34]. Figure 1 illustrates Godin's integrative theoretical model.

Theory-based approach to teachers' intention to teach, co-teach or invite a sexual health educator for sexuality education

Using a theoretical model is considered best practice for implementing evidence-based programs, both for direct targets of change (e.g., students) and for the agents who work with them (e.g., teachers) and who deliver school-based SE [33, 35]. Applying a theoretical model allows for a better understanding of key determinants of behavior and of the steps involved in the planning of change. Despite its importance, no study has recently used a theoretical model in implementation science for SE. However, Paulussen et al. in 1995 [36] were interested in better understanding the determinants of teachers' intention to choose one HIV prevention program over another among the four national curricula available in the Netherlands. Using an adapted version of the TPB [30], they demonstrated that subjective norm, descriptive norm, sexual morality, and perceived instrumentality of the innovation (i.e., the instructions' preciseness), were determinants of curriculum selection. They also concluded that the effects of different contextual variables, including sociodemographic variables, appear to be mediated by specific beliefs related to curriculum adoption.

Key factors associated with teachers' teaching, co-teaching or inviting a sexual health educator for sexuality education

Several studies have attempted to elucidate key factors that are related to teachers' delivery of SE. Past experience was found to positively influence teachers' willingness to teach the curriculum [20]. Attitude was found to be positively associated with teaching SE, whether regarding its benefits on students (cognitive dimension), benefits to be gained as a teacher (affective dimension), or to personal beliefs [37–43]. Norm has also been found to be negatively linked with SE delivery among teachers: students', parents', and administrators' opinions can be sources of concern or even censure [20, 40, 44, 45], and can influence teachers' levels of openness to teaching SE [20]. Finally, perceived control has been shown to be positively related to SE delivery. Feeling comfortable with the topics at hand or being confident in one's abilities to convey this type of knowledge is a crucial factor in adhering to, faithfully implementing, and delivering the curriculum [12, 43, 46]. Several facilitators have been reported by teachers: the presence of a national policy or curriculum, time, incentives for integrating SE into their discipline, additional resources (human, material, monetary), teamwork, ease of adoption of teaching methods, and the quality of available materials [40, 47–52]. Study findings conflict regarding the influence of external variables such as gender and age, but generally suggest that they are associated with attitude, norm, and perceived control rather than intention [20, 53]. Furthermore, being trained and familiarity with the curriculum has been shown to positively influence teachers' attitudes toward SE or comfort level relative to teaching it [12, 15, 20, 54–58].

Overall, in addition to not employing a theoretical model to support a better understanding of the key factors that may be related to teachers' delivery of SE, the aforementioned studies do not always specify the teachers' chosen SE delivery method. Behavioral prediction could be inaccurate when the behavior itself is too generic [59]. The lack of specificity regarding teachers' expected behavior can also render ineffective the implementation of supportive strategies for sexual health promotion in schools. For example, teachers with low or moderate levels of self-efficacy regarding teaching SE may not want to teach alone and instead opt for co-teaching or inviting a sexual health educator in their classroom.

In short, studies that focus on the determinants of teachers' intention to deliver SE are mostly atheoretical and do not address specific teaching strategies. Therefore, the purpose of this study is to measure, using Godin's integrative theoretical model, the psychosocial determinants of teachers' intention to deliver SE to their students according to one of the following teaching strategies: (1) teaching it alone; (2) co-teaching it; or (3) inviting a sexual health educator into their classroom. The present study's ultimate goal is to inform local public health decision-making by exploring optimal implementation conditions for school-based SE.

Methods

Procedure And Participants

A research steering committee was formed, grouping members of the research team, complementary educational service staff from the school board (n = 3), and health and social service networks (n = 4). The study was presented to the respective administrators, as well as to the elementary and secondary school principals. A joint statement of commitment was signed by the partners. The study was approved by the research ethics committee as well as by the health and social services center in the concerned region.

The questionnaire was developed using a qualitative participatory research approach (see the measures section for more details). Participant recruitment was conducted from November 2018 to February 2019. Participants received an email containing a hyperlink to the online questionnaire. Email reminders were sent by SE pedagogical advisors and the teachers' union. Follow-up by the schools was also conducted to show the total number of participants in order to foster participation.

The online survey was available from November 2018 to February 2019. Recruited teachers worked in a French-language school service center in Quebec, Canada. Recruitment targeted teachers working in the youth sector and who had an active contract at the time of the study (full-time, part-time, or casual). Teachers on maternity or sick leave were excluded from recruitment. Of the 2,200 eligible teachers, 19% accessed the survey (n = 425). Of these, 69% completed it (n = 295). The remaining 130 were excluded due to missing data on key dependent variables. The questionnaire took approximately 66 minutes to complete. A random draw for two \$100 gift certificates for the regional cultural center was conducted among consenting participants.

Measures

The overall survey was developed using a participatory approach, whereby the research team attended several partner meetings over a period of 18 months. Qualitative data collection triangulated the data from (1) participant-observation meetings (i.e., three meetings concerning the organization of SE services in schools, and two regional intersectoral meetings); (2) individual unstructured interviews with teachers (n = 4); (3) steering committee meetings organized by the research team to monitor the implementation of SE and to manage the research project (n = 5).

Analyses grounded in Godin's theoretical model revealed: (1) a consensus among partners to specify the target, action, context, time, and teachers' intention of adopting specific teaching strategies (i.e., the dependent variables: teaching alone, co-teaching, or inviting a sexual health educator); and (2) an overall portrait of the teachers' salient beliefs regarding each selected teaching strategy (i.e., the independent variables), which was used to develop the questionnaire items. The items were not limited to modal salient beliefs as recommended by Ajzen, since an overall portrait was useful for the partners' decision-making.

The questionnaire's content validity was assessed using a number of strategies: (1) a panel of six scientific experts provided written recommendations; (2) 15 teachers who were employed by a different school board participated in a focus group or provided written feedback; and (3) through working meetings with the research steering committee (n = 4) and union representatives (n = 2). The questionnaire's psychometric qualities were evaluated by calculating the scales' internal consistency (Cronbach's alpha). All scales reached the minimum recommended threshold of .70 [60], except for the scale assessing the affective dimension of attitude with regards to the strategy of inviting a sexual health educator ($\alpha = .69$).

Dependent variables

Intention was measured using a single item for each teaching strategy. Thus, the three intention items were: (1) "During the 2018–2019 year [time], I intend to teach by myself [action] the essential SE concepts [context] to my students [target]", (2) "During the 2018–2019 year [time], I intend to co-teach with other school staff (teacher, support, professional) [action] the essential SE concepts [context] to my students [target]", and (3) "During the 2018–2019 year [time], I intend to invite sexual health educators (school staff or partners as school nurses, community agencies, the police) [action] to teach essential SE concepts [context] to my students [target]". Intent was rated on a 7-point Likert scale, where higher scores represent a higher degree of intention to use the given teaching strategy. The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes).

Variables relative to the generic teaching of SE

The following variables were measured in relation to generic SE teaching (i.e., no teaching strategy was specified) in the 2018–2019 school year.

Past experience was measured using the item: "Last year, what SE activities were conducted in your classroom?" Those who answered "I did not conduct any activities" were categorized as having no past experience, while those who selected a specific activity were categorized as having conducted SE within the previous year.

Feeling comfortable with teaching the curriculum is a scale composed of a varying number of items based on the age-appropriate SE concepts found in the curriculum (e.g., "How comfortable would you be to teach [topic] to your 4 to 5 year old students [preschool/kindergarten?]", and relate to themes that include, but are not limited to, love life, sexual violence, gender stereotypes and social norms, and STIs. There are 12 possible teaching levels, from preschool/kindergarten to secondary 5. For example, there are three items (i.e., topics) for preschool and kindergarten-aged children (e.g., stages of pregnancy and welcoming a newborn), and up to nine items for secondary 3 students (i.e., 14 to 15 year old students) (e.g., critical thinking skills regarding representations of sexuality in the public space). Teachers' comfort level was measured using a 7-point Likert scale (1 – not at all comfortable; 7 – very comfortable). For each teacher, item scores were averaged to create overall scale scores for all of their teaching levels (e.g., a teacher can teach in secondary 3 and 4, and would thus be evaluated for two levels of teaching). The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes). Cronbach's α ranged from .73 to .97 ($M = .91$).

Self-efficacy in sexual health education was assessed using eight items (e.g., "I would be able to adapt the Ministry's SE topics to my students' needs") adapted from the Self-efficacy in Health Education Role scale [61]. Responses ranged from 1 to 7 (1 – strongly disagree; 7 – strongly agree). The scores obtained on all eight items were compounded to create mean scale scores. The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes). The scale presented excellent internal consistency ($\alpha = .97$).

Self-efficacy with working in partnership was measured using 10 items (e.g., “I feel that I would be able to participate with other stakeholders in setting common goals”) adapted from the Self-efficacy with working in partnership for health education [61]. Responses ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). Item scores were compounded to create mean scale scores. Cronbach’s α was .92.

Variables relative to the specific teaching strategies

The following variables were measured for each SE teaching strategy (i.e., teaching alone, co-teaching, or inviting a sexual health educator) during the 2018–2019 school year.

The **cognitive dimension of attitude** was evaluated using nine items (x3). Participants were asked: “Regarding the SE concepts to be taught in 2018–2019, how much do you agree with the following potential effects on your students?”. One of the measured effects included “Students’ sexual health will be improved if I teach them myself”. Responses ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). Item scores were compounded to create mean scale scores. The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes). Cronbach’s alphas were .82, .83, and .83 for teaching alone, co-teaching, and inviting a sexual health educator, respectively.

The **affective dimension of attitude** was measured using 10 items (x3). Participants were asked: “Regarding the SE concepts to be taught in 2018–2019, how much do you agree with the following potential effects on yourself?”. One of the examined effects included “I will enjoy doing my job if I teach them myself”. Ratings ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). Item scores were averaged to create mean scale scores. The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes). Cronbach’s alphas were .79, .82, and .69 for teaching alone, co-teaching, and inviting a sexual health educator, respectively.

Anticipated regret was measured with a single item (x3) (e.g., “if I don’t teach my students the concepts of SE myself, I will feel remorse”). Scores ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes).

Normative beliefs were measured with eight items (x3) (e.g., “My students’ parents will endorse my initiative”). For each of these items, respectively, participants’ motivation to conform was also measured (e.g., “To what extent do you feel influenced by these people or groups of people to teach alone SE concepts?”). Responses ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree) for normative beliefs and motivation to conform. **Subjective norm** scores were created by averaging the sum of the products “normative beliefs X motivation to conform” for all eight items. Overall scores ranged from 1 to 49. Cronbach’s alphas were .82, .83, and .83 for teaching alone, co-teaching, and inviting a sexual health educator, respectively.

Descriptive norm was assessed using a single item (x3): “In your opinion, of all the teachers you know in your school district, how many of them (%) teach SE concepts?”. Reported percentages ranged from 0 to 100. The variable was then dichotomized (0 to 50 = no; 51 to 100 = yes).

Moral norm was evaluated using one item (x3): “Teaching SE myself to my students is a matter of duty that I find self-fulfilling”. Response options ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). The variable was dichotomized (1 to 4 = no; 5 to 7 = yes).

Social role/personal identity was measured with a single item (x3): “Teaching students about SE myself is part of a teacher’s job”. Scores ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). The variable was dichotomized (1 to 4 = no; 5 to 7 = yes).

Facilitating factors were evaluated using 17 items (x3). Participants were asked: “It will be easier for me to teach by myself the curriculum if...”. One of the facilitators examined included “The presence of a sexologist at the school”. Ratings ranged from 1 to 7 (1 – strongly disagree; 7– strongly agree). Item scores were compounded to produce mean scale scores. The variable was then dichotomized (1 to 4 = no; 5 to 7 = yes). Cronbach’s alphas were .95, .95, and .92 for teaching alone, co-teaching, and inviting a sexual health educator, respectively.

Analyses

Multiple imputations using a sequence of regression models were performed on the variables of interest’s (intentions and their determinants) missing values. Most of the data were complete (97.4%). Models were based on scale- and item-level for cross-sectional questionnaire data using regression and the Markov Chain Monte Carlo method, which has been proven effective for processing missing data. The proportion of missing data varied from 0–9.5% depending on the variable and was mostly due to questionnaires not being completed. Univariate analyses showed that respondents who did not complete the questionnaire were statistically ($p < .05$) similar to those who did on all sociodemographic variables. Internal consistency analyses were performed for each scale. Bivariate analyses and univariate logistic regressions were performed on the determinants (generic teaching, specific teaching strategy, external variables) and on the intentions (i.e., the intention to teach alone, co-teach, and invite a sexual health educator). For bivariate analysis, we pooled standardized coefficients in the regression models by averaging the values across imputed data sets. Hierarchical logistic regressions were then performed to identify the determinants of each teaching strategy. Because all variables were found to be significantly associated with at least one of the teaching strategies ($p < .05$), they were included in all three logistic regression models. Generic SE teaching-related variables were included in step one, specific teaching strategy-related variables were entered in step 2, and external variables were included as control variables, as suggested by Godin’s framework, in step 3. All analyses were conducted using the statistical software SPSS, version 26. The basic assumptions of no multicollinearity and independence of residuals were respected for all three logistic regressions. The tolerance indicators were greater than .10 and the VIF values were lower than 10. Examination of the residuals showed that they were normally distributed [62].

Results

Participants were recruited from 51 elementary schools and 12 secondary schools. Most were female (82.4%), and around one-fifth (17.6%) were male (see Table 1 for the sample’s description). The sample’s mean age was 39.1 years. A minority had a graduate degree (9.5%), and most (71.5%) were parents. About

two-fifths (43.1%) had over 15 years of teaching experience. Most participants (72.9%) had permanent employment status. The majority of participants taught at the elementary level (60.3%), while a few taught in a special education setting (14.6%) and to multi-age or multi-level groups (20.3%). Finally, 34.6% of participants had received SE training at school or at work, and 63.4% of them were familiar with the new SE curriculum.

Table 1
Sample description (n = 295)

Variables	N	%
Gender		
Men	52	17.6
Women	243	82.4
Mean age	39.1	-
Education		
Graduate degree	28	9.5
Other (college diploma, undergraduate degree)	267	90.5
Being a parent		
Yes	211	71.5
No	84	28.5
Employment status		
Full-time	215	72.9
Other (part-time or casual)	80	27.1
Teaching		
At primary school (vs secondary school)	178	60.3
Special education	43	14.6
Multi-age or multi-level groups	60	20.3
Received training in SE (at school or at work)	102	34.6
Being familiar with the new SE curriculum	187	63.4

Descriptive statistics of teachers' intention to teach alone, co-teach, or to invite a sexual health educator to deliver sexuality education

Table 2 shows teachers' intentions to use one or several SE teaching strategies. For instance, 39.7% of teachers intended to teach SE to their students on their own, while 36.6% intended to co-teach it, and 76.6%, to invite a sexual health educator. In total, 21.4% of teachers intended to teach SE themselves **and** to co-teach, while 30.5% intended to teach alone **and** to invite a sexual health educator. Also, 255 teachers (86.4%) intended to deliver SE by doing either of those actions (Table 3). Of these, 45.9% intended to teach alone, 42.4% intended to co-teach, and 88.6%, to invite a sexual health educator.

Table 2
Teachers' intention to teach alone, co-teach, or invite a sexual health educator for SE (n = 295)

Intention	Teach alone		Co-teach		Invite a sexual health educator	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Teach alone	Yes	117 (39.7)	-			
	No	-	178 (60.3)			
Co-teach	Yes	63 (21.4)	45 (15.3)	108 (36.6)	-	
	No	54 (18.3)	133 (45.1)	-	187 (63.4)	
Invite a sexual health educator	Yes	90 (30.5)	136 (46.1)	100 (33.9)	126 (42.7)	226 (76.6)
	No	27 (9.2)	42 (14.2)	8 (2.7)	61 (20.7)	-

Table 3
 Teachers' intention by teaching strategies if they want to deliver SE (n = 255)

Intention	Yes (%)	No (%)	Total
Teach alone	117 (45.9)	138 (54.1)	255
Co-teach	108 (42.4)	147 (57.6)	255
Invite a sexual health educator	226 (88.6)	29 (11.4)	255

Regression models examining predictors of the intention to teach alone, co-teach, or to invite a sexual health educator to deliver sexuality education

Regression models are presented in Table 4. The final multivariate regression model explains 58% of the variance (Nagelkerke's R^2) in teachers' intention to teach SE alone. In this model, five predictors were significantly and positively associated with the outcome variable. The most significant predictor was self-efficacy in sexual health education (OR = 6.07; $p < .001$), followed by moral norm (OR = 5.35; $p < .001$), descriptive norm (OR = 3.37; $p < .01$), feeling comfortable teaching the SE curriculum (OR = 3.09; $p < .01$), and past experience (OR = 2.89; $p < .01$). Age was also negatively associated with the outcome variable, with older teachers being less likely than younger ones to intend to teach SE by themselves (OR = 0.92; $p < .001$).

Table 4
Regression models examining predictors of intention to teach alone, co-teach, invite a sexual health educator (n = 295)

Variables	Intention to teach alone		Intention to co-teach		Intention to invite a sexual health educator	
	Univariate OR [95% CI]	Multivariate OR [95% CI]	Univariate OR [95% CI]	Multivariate OR [95% CI]	Univariate OR [95% CI]	Multivariate OR [95% CI]
<i>Step 1</i>						
Past experience	4.10 [2.46–6.80]***	2.89 [1.42–5.88]**	1.73 [1.04–2.86]*	1.15 [.57-2.32]	1.46 [.82-2.58]	1.33 [.61-2.86]
Feeling comfortable teaching the curriculum	6.63 [3.88–11.34]***	3.09 [1.45–6.55]**	2.33 [1.42–3.82]**	1.15 [.56-2.33]	.59 [.33-1.04]	.45 [.20-.99]*
Self-efficacy in sexual health education	8.95 [5.10–15.71]***	6.07 [2.78–13.22]***	2.44 [1.46–4.05]**	.87 [.42 – 1.80]	.89 [.50-1.57]	.72 [.31-1.63]
Self-efficacy with working in partnership	1.58 [1.32–1.88]***	.85 [.65-1.09]	1.72 [1.42–2.08]***	1.27 [1.02–1.59]*	1.20 [1.00–1.44]*	1.10 [.87-1.39]
<i>Step 2</i>						
Cognitive dimension of attitude	3.43 [1.86–6.31]***	1.44 [.61-3.37]	1.64 [.87 – 3.10]	.69 [.28-1.67]	1.66 [.81-3.39]	.83 [.30 – 2.30]
Affective dimension of attitude	3.71 [2.14–6.41]***	1.13 [.48 – 2.60]	2.38 [1.37–4.18]**	.98 [.41-2.31]	1.51 [.74-3.09]	.94 [.33-2.63]
Anticipated regret	4.06 [2.17–7.59]***	.57 [.20-1.54]	3.48 [1.87–6.47]***	1.57 [.67-3.66]	5.35 [2.67–10.75]***	2.45 [1.09–5.51]*
Subjective norm	1.12 [1.08–1.15]***	1.02 [.97-1.06]	1.07 [1.03–1.10]***	.98 [.93-1.02]	1.02 [.98-1.05]	.98 [.93-1.02]
Descriptive norm	4.08 [2.23–7.44]***	3.37 [1.40–8.06]**	2.02 [1.06–3.83]*	.94 [.39-2.23]	4.21 [2.27–7.77]***	2.38 [1.14–4.96]*
Moral norm	9.02 [4.99–16.27]***	5.35 [2.18–13.10]***	8.60 [4.92–15.03]***	7.97 [3.86–16.46]***	5.31 [2.96–9.51]***	3.81 [1.78–8.16]***
Social role/personal identity	3.84 [2.31–6.36]***	1.20 [.53-2.71]	5.41 [2.88–10.16]***	2.06 [.97-4.35]	4.58 [1.53–13.67]**	2.27 [.62-8.28]
Facilitators	3.15 [1.69–5.85]***	.61 [.25-1.47]	3.32 [1.68–6.55]**	1.15 [.47 – 2.80]	2.12 [1.06–4.23]*	1.87 [.77-4.51]
<i>Step 3 (control variables)</i>						
Gender	2.01 [1.03–3.91]*	1.03 [.41-2.52]	.99 [.53-1.86]	.44 [.19-.98]*	1.98 [1.03–3.79]*	.83 [.36-1.87]
Age	1.00 [.97-1.03]	.92 [.88-.96]***	1.00 [.97-1.03]	.93 [.89-.96]***	1.00 [.97-1.03]	.98 [.94-1.02]
Educational attainment	1.14 [.51-2.52]	1.12 [.35-3.53]	1.58 [.72-3.47]	3.40 [1.22–9.42]*	1.47 [.53-4.02]	1.84 [.54-6.33]
Being a parent	1.47 [0.86–2.50]	0.94 [.40-2.17]	1.39 [.81 – 2.40]	1.88 [.83-4.25]	1.03 [.56-1.87]	1.21 [.53-2.75]
Job permanence	1.22 [.71-2.08]	2.11 [.87-5.07]	1.04 [.60-1.78]	1.22 [.54-2.75]	1.35 [.75-2.44]	.89 [.36-2.17]
<i>Teaching</i>						
in primary schools (vs. secondary schools)	1.09 [.67-1.76]	.92 [.43-1.92]	.93 [.57-1.51]	.76 [.38-1.48]	2.27 [1.31–3.93]**	1.52 [.76-3.02]
in special education	1.24 [.64-2.39]	.95 [.34-2.66]	1.17 [.59-2.27]	.71 [.26-1.89]	.66 [.32-1.36]	.91 [.36-2.27]
to multi-age or multi-level groups	1.44 [.81-2.54]	.96 [.40-2.25]	2.08 [1.15–3.74]*	2.36 [1.04–5.32]*	1.27 [.62-2.56]	1.40 [.56-3.46]
Received training in sex education (at work or school)	2.18 [1.33–3.57]**	1.06 [.52-2.16]	1.83 [1.11–3.01]*	1.31 [.68-2.52]	1.17 [.66-2.09]	1.42 [.68-2.95]
Being familiar with the new SE curriculum	5.05 [2.84–8.97]***	1.65 [0.79–3.40]	2.93 [1.69–5.06]***	2.02 [.96-4.24]	1.57 [.89-2.76]	.99 [.45-2.14]
* Significant $p < .05$; ** significant $p < .01$; *** significant $p < .001$.						

The final multivariate regression model examining teachers' intention to co-teach SE explains 46% of variance. In this model, four predictors were significantly and positively related to the outcome variable. The most important predictor was moral norm (OR = 7.97; $p < .001$), followed by educational attainment (OR =

3.40; $p < .05$), teaching multi-age or multi-grade groups (OR = 2.36; $p < .05$), and self-efficacy with working in partnership (OR = 1.27; $p < .05$). Further, age and gender were negatively associated with the outcome variable. Teachers who identified as female (OR = 0.44; $p < .05$) and who were older (OR = 0.93; $p < .001$) were less likely to intend to co-teach SE than those who identified as male and who were younger.

The final multivariate regression model examining the intention to invite a sexual health educator to provide SE explains 55% of the variance. In this model, four predictors were statistically significant. The most important predictor was moral norm (OR = 3.81; $p < .001$), followed by anticipated regret (OR = 2.45; $p < .05$), and descriptive norm (OR = 2.38; $p < .05$). Teachers who reported feeling comfortable teaching the SE curriculum (OR = 0.45; $p < .05$) were less likely to intend to invite a sexual health educator.

Discussion

The purpose of this study was to examine the psychosocial determinants of teachers' intention to deliver SE, using a theoretical model. A total of 86.4% of teachers reported intending to deliver SE to their students using at least one teaching strategies. Our data suggest that teachers are making an impressive contribution to the implementation of the SE curriculum in their schools without necessarily having any expertise in sexual health or sexology. However, the results suggest that the prevalence and determinants of the intention to deliver SE varies depending on the specific teaching strategy.

Nearly 75% of teachers intended to have a sexual health educator from their school or community (e.g., school nurses, community agencies, etc.) in their classroom, making it the most popular strategy. Its high prevalence could be due to two things. First, it is possible that the few teachers who intended to teach SE alone (30.5%) or to co-teach it (33.9%) are interested in this teaching strategy to diversify their teaching approaches [63]. Second, the results suggest that this strategy appeals to teachers who want to help deliver SE, but have neither the desire nor the skills to do so on their own. On the one hand, normative influences suggest that their intention is motivated by introjected regulation (see Ryan & Deci, 2000), that is, by internalized pressure from the environment. Because descriptive norms can act as peer compliance pressure [64], these teachers could intend to invite a sexual health educator to avoid the feelings of guilt or shame (i.e., anticipated regret) that may result from not providing SE to their students. On the other hand, while these teachers acknowledge that SE can have a positive impact on the community and agree that it should be provided (moral norm), they do not feel competent to do so. Our findings show that teachers reporting a high comfort level with teaching the SE curriculum are less likely to invite a sexual health educator in their classroom. This is consistent with the idea that health professionals are often called upon by schools due of teachers' neglect of SE concepts or because of their discomfort in addressing them [12, 65–67].

Regarding the strategy of teaching SE alone, 39.7% of teachers reported intending to do so. This prevalence suggests that teaching SE is an accessible task for many teachers, and may also reflect schools' reliance on teachers' professional autonomy and authority in their own classrooms, as well as importance of teachers' perceptions of control. Our results also suggest that teaching comfort plays a central role in the intention to teach SE alone, a finding that also has been reported in other studies [12, 20, 46]. However, our study shows that self-efficacy regarding one's role in sexual health education carries more weight in one's intention to adopt this strategy than does comfort in teaching sensitive topics about human sexuality. Thus, a teacher's sense of self-efficacy in integrating SE concepts in a transdisciplinary or interdisciplinary manner is critical to their intent to adopt this strategy. This integration involves several skills, including the identification, design, and adaptation of sexual health concepts into their education plan, and requires – as with health education – pedagogical innovation [68].

The influence of moral norms, descriptive norms, and self-efficacy factors on teachers' intention to teach SE alone suggests that their intention is motivated by integrated or at least identified regulation. According to Deci and Ryan's theory of self-determination [69], integrated regulation, and identified regulation – although to a lesser extent – is a type of extrinsic motivation involving the internalization of a given norm. The intention to teach SE alone would have an extrinsic goal, but one with which teachers identify because it is consistent with their values and self-concept. In this sense, teachers who intend to teach SE alone enjoy their professional autonomy and feel confident with their pedagogical skills, even if it involves taking on a less traditional role in a school setting, such as sexual health promotion and prevention. Here, the descriptive norm (i.e., the perceived prevalence of the adoption of this teaching strategy by colleagues), acts as a positive influence on their intention to utilize this strategy because it reinforces their personal perception of the importance of their own role in delivering SE. It may be reassuring for teachers to work in a school that is adequately set up for SE, as it fosters their willingness to comply freely and autonomously, feeling free from any pressure to participate in the program' implementation.

Our study further shows that past experience is a determinant of teachers' intention to teach SE on their own. Teachers' professional development largely occurs through trial and error [70]. A positive experience with teaching SE can act as an enactive mastery experience and can give confidence in one's pedagogical competence to address SE in the classroom, which in turn may positively influence one's intention to repeat the experience in the future [32, 71]. Also, because we measured generic past SE experience, it can also include vicarious experience, that is, experience through observation (e.g., from observing guest nurses in the classroom) [32, 71]. Although it is less impactful than enactive mastery experience in forming a sense of self-efficacy, vicarious experience may be sufficient to convince teachers that they have the skills necessary to teach SE on their own.

The co-teaching model was the least popular among teachers, with just over 36% intending to adopt this strategy. Co-teaching is a marginal practice in the education system, but it is nonetheless associated with promising innovations. It would be particularly well-suited to transdisciplinary or interdisciplinary teaching [72] as well as to the teaching of sensitive topics [73]. In terms of implementation, it presents a few challenges as it requires planning, time for related discussions and feedback, administrative support, and adequate equipment [74–76]. As our results suggest, teachers who report greater self-efficacy in working in partnership are more likely to intend to co-teach SE. As with the teaching alone strategy, the influence of the moral norm and of self-efficacy in working in partnership suggests that intention may be motivated by integrated regulation (Deci and Ryan, 2000). The personal obligation to co-teach SE seems to be positively internalized because it corresponds to a personal ideal of achieving school-based SE through collaborative and partnership practices. On the other hand, these teachers might be more driven by self-determination motives, since co-teaching SE is a marginal practice. This teaching strategy

might align with personal values of pedagogical innovation through collaborative practices and be a source of self-fulfillment. The finding that having a graduate degree is a significant predictor of the intention to co-teach SE is further evidence of an attraction to innovation among these teachers. It is possible that they have been exposed to the idea of co-teaching as best practice during their graduate studies.

We also found that co-teaching SE is attractive to teachers who teach to multi-age or multi-level groups. They usually teach in one of these educational settings: a) special needs; b) small schools in rural communities; and c) alternative schools focused on educational innovation. Teaching in these settings fosters collaboration among colleagues and interdisciplinary instruction [77], making co-teaching an overall effective [78], and even recommended practice for SE [79]. Our results suggest that co-teaching is an attractive option for those who need to teach the SE program to groups comprised of students who are at varying stages of psychosexual development due to age differences. Co-teaching would allow for alternative teaching methods that are adapted to the groups' specific needs, such as workshops. Working in partnership could also provide a safety net for teachers who want to offer SE to their students as they innovate, which could be easier to do through joint interprofessional skills.

Limitations

This study presents a few limitations. For instance, the sample is composed of volunteers and is subject to participant self-selection bias. Also, the completion rate was approximately 10%, which is low. Nevertheless, the sample's sociodemographic characteristics were similar to Quebec's teaching population, which fosters the data's generalizability. The development and validation of the selected measures also have limitations. First, several variables were measured using a single item. Further, the survey's length may have contributed to participant attrition. Also, the survey was not subjected to test-retest reliability analyses. Four variables measured the generic teaching of SE without accounting for specific behaviors of teaching strategies. According to TPB's correspondence principle, this vagueness could affect the measure's reliability. Yet, we believe that the benefits of a design shift in teachers' implementation of SE programs outweigh this limitation. The study confirms that teachers' intention to implement SE differs in function of the specific teaching strategy. Lastly, measuring possible barriers to perceived control would have potentially allowed for a better prediction of the different teaching strategies.

Conclusions

This is the first study of its kind to use a theoretical model to investigate schoolteachers' intentions to adopt specific SE teaching strategies, as well as their determinants. A multitude of intervention approaches should be used in schools to optimize the implementation of an SE program by bringing about behavior change among teachers.

Interventions should increase teachers' sense of personal obligation to teach alone, co-teach, or to invite a sexual health educator in their classroom by promoting SE's positive societal benefits and by preserving the option to freely volunteer to do so. The only determinant of intention that was common to all three teaching strategies was the moral norm (i.e., teachers' internalization of external pressure to deliver SE), which speaks to their identity and to how they perceive themselves to varying degrees depending on the teaching strategy. Behavior change associated with prosocial behaviors can inform the decision-making process regarding the adoption of specific interventions, particularly the principles of beneficence and autonomy [80]. Teachers would be more motivated to use any of the examined teaching strategies to deliver SE if they perceive them to benefit the community (beneficence principle). Second, because SE is integrated on a voluntary basis, teachers have the professional autonomy to either adopt or reject a given strategy. Teachers are free to choose to deliver SE according to their own sense of moral obligation. Thus, schools must continue to encourage teachers' professional autonomy by enhancing those who are willing to do so. Pressure to teach SE could be perceived as a threat to one's professional identity and could initiate a boomerang effect, (i.e., resistance resulting from the real or perceived pressure to adopt a given behavior) [81, 82].

Although training is an attractive intervention to help foster behavior change among teachers [12], it should not be the only option for supporting them with regards to SE. To promote the solo teaching of SE, schools should support teachers' perception of control. Measures that facilitate one's appropriation of the sexual health educator role and that support the development of self-efficacy in this role should be implemented. To encourage the co-teaching of SE, schools should value collaborative and partnership work by providing clear incentives, such as recognition. This teaching strategy would also benefit from being publicized to teachers who work with multi-age or multi-level groups. Lastly, the primary benefit of having a sexual health educator in class to deliver SE is to improve access to sexual health services, as students then get exposed to health or community professionals that are available outside of SE classes (e.g., counseling with the school nurse for contraception) [83]. Furthermore, this latter teaching strategy tends to be valued by students, especially those who are newly sexually active or who are about to become sexually active [84]. This strategy should be encouraged in the school environment for these benefits, notably among teachers with low comfort levels with teaching SE.

Abbreviations

SE
sexuality education
TPB
Theory of planned behavior

Declarations

Ethics Declarations

Ethics approval was obtained from the research ethics boards of the Centre intégré de Santé et de Services Sociaux de Lanaudière (#318-01NSCOS-L14), and the Université du Québec à Montréal (#1499).

Consent for publication

Not applicable

Availability of data and materials

Please contact the lead author for more information.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JD and JO planned the study. JD conducted the study and JO supervised it. Writing of the paper was led by JD with JO commenting on drafts and approving the final version.

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Authors' information

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References

1. Vivancos R, Abubakar I, Phillips-Howard P, Hunter PR. School-based sex education is associated with reduced risky sexual behaviour and sexually transmitted infections in young adults. *Public Health*. 2013;127:53–7. <https://doi.org/10.1016/j.puhe.2012.09.016>.
2. Kawai K, Kaaya SF, Kajula L, Mbwapo J, Kilonzo GP, Fawzi WW. Parents' and teachers' communication about HIV and sex in relation to the timing of sexual initiation among young adolescents in Tanzania. *Scand J Public Health*. 2008;36:879–88. <https://doi.org/10.1177/1403494808094243>.
3. Garzón-Orjuela N, Samacá-Samacá D, Moreno-Chaparro J, Ballesteros-Cabrera MDP, Eslava-Schmalbach J. Effectiveness of Sex Education Interventions in Adolescents: An Overview. *Compr Child Adolesc Nurs*. Taylor Francis. 2020;0:1–34. <https://doi.org/10.1080/24694193.2020.1713251>.
4. Makleff S, Garduño J, Zavala RI, Barindelli F, Valades J, Billowitz M, et al. Preventing Intimate Partner Violence Among Young People—a Qualitative Study Examining the Role of Comprehensive Sexuality Education. *Sex Res Soc Policy*. 2019;17:314–35. <https://doi.org/10.1177/1403494808094243>.
5. Bowring AL, Wright CJC, Douglass C, Gold J, Lim MSC. Features of successful sexual health promotion programs for young people: findings from a review of systematic reviews. *Health Promot J Austr*. 2018;29:46–57. <https://doi.org/10.1002/hpja.3>.
6. Baams L, Dubas JS, van Aken MAG. Comprehensive Sexuality Education as a Longitudinal Predictor of LGBTQ Name-Calling and Perceived Willingness to Intervene in School. *J Youth Adolesc*. 2017;46:931–42. <https://doi.org/10.1007/s10964-017-0638-z>.
7. Denford S, Abraham C, Campbell R, Busse H. A comprehensive review of reviews of school-based interventions to improve sexual-health. *Health Psychol Rev*. 2017;11:33–52. <https://doi.org/10.1080/17437199.2016.1240625>.
8. Bourke A, Boduszek D, Kelleher C, McBride O, Morgan K. Sex education, first sex and sexual health outcomes in adulthood: findings from a nationally representative sexual health survey. *Sex Educ*. 2014;14:299–309. <https://doi.org/10.1080/14681811.2014.887008>.
9. Kirby D. Sex education: Access and impact on sexual behaviour of young people. NY Dep Econ Soc Aff U N Sec; http://www.un.org/esa/population/meetings/egm-adolescents/p07_kirby.pdf; Accessed 3 Feb 2021. 2011.
10. Ma Z, Fisher MA, Kuller LH. School-based HIV/AIDS education is associated with reduced risky sexual behaviors and better grades with gender and race/ethnicity differences. *Health Educ Res*. 2014;29:330–9. <https://doi.org/10.1093/her/cyt110>.
11. Ashcraft C. So Much More Than “Sex Ed”: Teen Sexuality as Vehicle for Improving Academic Success and Democratic Education for Diverse Youth. *Am Educ Res J*. 2008;45:631–67. <https://doi.org/10.3102/0002831207313344>.
12. Walker R, Drakeley S, Welch R, Leahy D, Boyle J. Teachers' perspectives of sexual and reproductive health education in primary and secondary schools: a systematic review of qualitative studies. *Sex Educ Routledge*. 2020;0:1–18. <https://doi.org/10.1080/14681811.2020.1843013>.
13. Montgomery P, Knerr W. Review of the evidence on sexuality education: report to inform the update of the UNESCO International technical guidance on sexuality education. Paris: UNESCO; <https://unesdoc.unesco.org/ark:/48223/pf0000264649>; Accessed 21 Feb 2021. 2018.
14. LaChausse RG, Clark KR, Chapple S. Beyond teacher training: the critical role of professional development in maintaining curriculum fidelity. *J Adolesc Health Off Publ Soc Adolesc Med*. 2014;54:53-8. <https://doi.org/10.1016/j.jadohealth.2013.12.029>.
15. Schutte L, Meertens RM, Mevissen FEF, Schaalma H, Meijer S, Kok G. Long Live Love. The implementation of a school-based sex-education program in The Netherlands. *Health Educ Res*. 2014;29:583–97. <https://doi.org/10.1093/her/cyu021>.

16. Musiimenta A. Social and Institutional issues in the Adoption of School-based Technology-aided Sexual Health Education Program. *Online J Public Health Inform.* 2013;5:213. <https://doi.org/10.5210/ojphi.v5i2.4654>.
17. Schaalma HP, Abraham C, Gillmore M, Kok G. Sex education as health promotion: what does it take? *Arch Sex Behav.* 2004;33:259–69. <https://doi.org/10.1023/B:ASEB.0000026625.65171.1d>.
18. Action Canada for Sexual Health and Rights in Canada. The state of Sex-Ed in Canada. Ottawa. https://www.actioncanadashr.org/sites/default/files/2019-09/Action%20Canada_StateofSexEd_F%20-%20web%20version%20EN.pdf; Accessed 19 Feb 2021. 2020.
19. Nixon C, Elliott L, Henderson M. Providing sex and relationships education for looked-after children: a qualitative exploration of how personal and institutional factors promote or limit the experience of role ambiguity, conflict and overload among caregivers. *BMJ Open.* 2019;9:e025075. <https://doi.org/10.1136/bmjopen-2018-025075>.
20. Cohen JN, Byers ES, Sears HA. Factors affecting Canadian teachers' willingness to teach sexual health education. *Sex Educ.* 2012;12:299–316. Available from: <https://doi.org/10.1080/14681811.2011.615606>.
21. Elia JP, Eliason MJ. Values-Free Sexuality Education: Myth or Reality? *Sex Educ Past Present Future.* Praeger. Westport & London: ABC-CLIO; 2009. p. 174–98. ISBN 9780275997953.
22. Sinkinson M. 'Sexuality isn't just about sex': pre-service teachers' shifting constructs of sexuality education. *Sex Educ Routledge.* 2009;9:421–36. <https://doi.org/10.1080/14681810903265352>.
23. Vamos S, Zhou M. Using Focus Group Research to Assess Health Education Needs of Pre-service and In-service Teachers. *Am J Health Educ Routledge.* 2009;40:196–206. <https://doi.org/10.1080/19325037.2009.10599094>.
24. Khzami S-E, Berger D, Hage FE, Forest VDL, Bernard S, Abrougui M, et al. Description et déterminants des conceptions des enseignants de 4 pays méditerranéens sur l'éducation à la sexualité. *Sante Publique.* 2008;20:527–45. <https://doi.org/10.3917/spub.086.0527>.
25. Preston M. "I'd rather beg for forgiveness than ask for permission": Sexuality education teachers' mediated agency and resistance. *Teach Teach Educ.* 2019;77:332–40. <https://doi.org/10.1016/j.tate.2018.10.017>.
26. Vallerand O, Lavoie K, Richard G, Charbonneau A, Petit M-P, Rolland-Déry M, et al. Témoigner plutôt que débattre: les interventions en milieu scolaire du GRIS-Montréal. *Rev Genre Éducation Form.* 2019;3:99–112. <http://revuegef.org/uploads/7.%20Vallerand%20et%20al..pdf>.
27. Smith A, Fotinatos N, Duffy B, Burke J. The provision of sexual health education in Australia: primary school teachers' perspectives in rural Victoria. *Sex Educ.* 2013;13:1–16. <https://doi.org/10.1080/14681811.2012.715580>.
28. Otis J, Gaudreau L, Duquet F, Michaud F, Nonn É. L'intégration et la coordination des actions en éducation à la sexualité en milieu scolaire dans le contexte en transformation des réseaux de l'éducation et de la santé. Démarche évaluative en soutien à la mise en oeuvre de la Stratégie québécoise de lutte contre le VIH, le VHC et les ITS. Chaire de recherche du Canada en éducation à la santé. https://www.inspq.qc.ca/sites/default/files/documents/itss/L_integracion_et_la_coordination_des_actions_en_education_a_la_sexualite_en_milieu_scolair Accessed 3 Feb 2021. 2012.
29. Godin G, Vézina-Im L-A. Les théories de prédiction. Les comportements dans le domaine de la santé: Comprendre pour mieux intervenir. Montréal: Les Presses de l'Université de Montréal; 2012. pp. 13–40.
30. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process.* 1991;50:179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T).
31. Triandis HC. Monterey. Interpersonal behavior. Calif.: Brooks/Cole Pub. Co.; 1977.
32. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev.* 1977;84:191–215. <https://doi.org/10.1037/0033-295X.84.2.191>.
33. Kok G, Peters LWH, Ruiter RAC. Planning theory- and evidence-based behavior change interventions: a conceptual review of the intervention mapping protocol. *Psicol Reflex E Crítica.* 2017;30:19. <https://doi.org/10.1186/s41155-017-0072-x>.
34. Sutton S, Baum A, Johnston M. The SAGE Handbook of Health Psychology. SAGE; 2004.
35. Bartholomew Eldredge LK, Markham CM, Ruiter RAC, Fernandez ME, Kok G, Parcel GS. Planning Health Promotion Programs: An Intervention Mapping Approach. San Francisco: John Wiley & Sons; 2016.
36. Paulussen T, Kok G, Schaalma H, Parcel GS. Diffusion of AIDS Curricula Among Dutch Secondary School Teachers. *Health Educ Q.* 1995;22:227–43. <https://doi-org/10.1177/109019819502200210>.
37. de Haas B, Hutter I. Teachers' conflicting cultural schemas of teaching comprehensive school-based sexuality education in Kampala, Uganda. *Cult Health Sex.* 2019;21:233–47. <https://doi.org/10.1080/13691058.2018.1463455>.
38. DePalma R, Francis D. South African life orientation teachers: (not) teaching about sexuality diversity. *J Homosex.* 2014;61:1687–711. <https://doi.org/10.1080/00918369.2014.951256>.
39. Rijdsdijk LE, Bos AER, Lie R, Leerlooijer JN, Eiling E, Atema V, et al. Implementation of The World Starts With Me, a comprehensive rights-based sex education programme in Uganda. *Health Educ Res.* 2014;29:340–53. <https://doi.org/10.1093/her/cyt108>.
40. Eisenberg ME, Madsen N, Oliphant JA, Sieving RE. Barriers to Providing the Sexuality Education That Teachers Believe Students Need. *J Sch Health.* 2013;83:335–42. <https://doi.org/10.1111/josh.12036>.
41. Francis DA. Teacher positioning on the teaching of sexual diversity in South African schools. *Cult Health Sex.* 2012;14:597–611. <https://doi.org/10.1080/13691058.2012.674558>.
42. Mkumbo KA. Teachers' attitudes towards and comfort about teaching school-based sexuality education in urban and rural Tanzania. *Glob J Health Sci.* 2012;4:149–58. <https://doi.org/10.5539/gjhs.v4n4p149>.

43. Hinduan ZR, Riyanti E, Tasya IA, Pohan MN, Sumintardja EN, Astuti SR, et al. HIV prevention through drugs and sex education in junior high schools in Bandung West Java: the teachers' perspective. *Acta Medica Indones*. 2009;41(Suppl 1):6–11.
44. Johnson-Motoyama M, Moses M, Kann TK, Mariscal ES, Levy M, Navarro C, et al. Parent, Teacher, and School Stakeholder Perspectives on Adolescent Pregnancy Prevention Programming for Latino Youth. *J Prim Prev*. 2016;37:513–25. <https://doi.org/10.1007/s10935-016-0447-2>.
45. da Silva DQ, Guerra OU, Sperling C. Sex education in the eyes of primary school teachers in Novo Hamburgo, Rio Grande do Sul, Brazil. *Reprod Health Matters*. 2013;21:114–23. [https://doi.org/10.1016/S0968-8080\(13\)41692-0](https://doi.org/10.1016/S0968-8080(13)41692-0).
46. Helleve A, Flisher AJ, Onya H, Kaaya S, Mukoma W, Swai C, et al. Teachers' confidence in teaching HIV/AIDS and sexuality in South African and Tanzanian schools. *Scand J Public Health*. 2009;37(Suppl 2):55–64. <https://doi.org/10.1177/1403494808095085>.
47. Khalaf ZF, Low WY, Merghati-Khoei E, Ghorbani B. Sexuality education in Malaysia: perceived issues and barriers by professionals. *Asia Pac J Public Health*. 2014;26:358–66. <https://doi.org/10.1177/1010539513517258>.
48. Renju J, Nyalali K, Andrew B, Kishamawe C, Kimaryo M, Remes P, et al. Scaling up a school-based sexual and reproductive health intervention in rural Tanzania: a process evaluation describing the implementation realities for the teachers. *Health Educ Res*. 2010;25:903–16. <https://doi.org/10.1093/her/cyq041>.
49. Renju JR, Andrew B, Medard L, Kishamawe C, Kimaryo M, Changalucha J, et al. Scaling up adolescent sexual and reproductive health interventions through existing government systems? A detailed process evaluation of a school-based intervention in Mwanza region in the northwest of Tanzania. *J Adolesc Health*. 2011;48:79–86. <https://doi.org/10.1016/j.jadohealth.2010.05.007>.
50. Rocha AC, Duarte C. Factors facilitating implementation of school-based sexuality education in Portugal. *Eur J Contracept Reprod Health Care Off J Eur Soc Contracept*. 2016;21:30–8. <https://doi.org/>.
51. van Lieshout S, Mevissen F, de Waal E, Kok G. Long Live Love+: evaluation of the implementation of an online school-based sexuality education program in the Netherlands. *Health Educ Res*. 2017;32:244–57. <https://doi.org/10.1093/her/cyx041>.
52. Suter S, McCracken W, Calam R. Sex and Relationships Education: Potential and Challenges Perceived by Teachers of the Deaf. *Deaf Educ Int Routledge*. 2009;11:211–20. <https://doi.org/10.1179/146431509790559534>.
53. Westwood J, Mullan B. Knowledge and attitudes of secondary school teachers regarding sexual health education in England. *Sex Educ Routledge*. 2007;7:143–59. <https://doi.org/10.1080/14681810701264490>.
54. Nacken A, Rehfuess EA, Paul I, Lupapula A, Pfadenhauer LM. Teachers' competence, school policy and social context-HIV prevention needs of primary schools in Kagera, Tanzania. *Health Educ Res*. 2018;33:505–21. <https://doi.org/10.1093/her/cyy036>.
55. Martínez J-L, Vicario-Molina I, González E, Ilabaca P. Sex education in Spain: the relevance of teachers' training and attitudes. *J Study Educ Dev Routledge*. 2014;37:117–48. <https://doi.org/10.1080/02103702.2014.881652>.
56. Dlamini N, Okoro F, Ekhosuehi UO, Esiet A, Lowik AJ, Metcalfe K. Empowering teachers to change youth practices: evaluating teacher delivery and responses to the FLHE programme in Edo State, Nigeria. *Afr J Reprod Health*. 2012;16:87–102. <https://doi.org/10.4314/AJRH.V16I2>.
57. Carman M, Mitchell A, Schlichthorst M, Smith A. Teacher training in sexuality education in Australia: how well are teachers prepared for the job? *Sex Health*. 2011;8:269–71. <https://doi.org/10.1071/SH10126>.
58. Lindau ST, Tetteh AS, Kasza K, Gilliam M. What schools teach our patients about sex: content, quality, and influences on sex education. *Obstet Gynecol*. 2008;111:256–66. <https://doi.org/10.1097/01.AOG.0000296660.67293.bf>.
59. Fishbein M, Ajzen I. *Predicting and Changing Behavior: The Reasoned Action Approach*. Taylor & Francis; 2009. ISBN: 9781136874734.
60. Field A. *Discovering Statistics Using IBM SPSS Statistics*. Sage Publications. ISBN 1446249182.
61. Plouffe G, Otis J, Bizzoni-Prévieux C. CAP-Santé et autoefficacité des enseignants en éducation à la santé. *Nouv Cah Rech En Éducation*. 2011;14:97. <https://doi.org/10.7202/1008914ar>.
62. Pallant J. *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS*. 2013. ISBN 0335262589.
63. Basian C. *Best Practices and Obstacles Teaching Sexual Health Education at the High School Level*. <http://hdl.handle.net/1807/687712015>; Accessed 28 Jan 2021. 2015.
64. Eyink JR, Motz BA, Heltzel G, Liddell TM. Self-regulated studying behavior, and the social norms that influence it. *J Appl Soc Psychol*. 2020;50:10–21. <https://doi.org/10.1111/jasp.12637>.
65. Goldman JDG. External providers' sexuality education teaching and pedagogies for primary school students in Grade 1 to Grade 7. *Sex Educ Routledge*. 2011;11:155–74. <https://doi.org/10.1080/14681811.2011.558423>.
66. Hayter M, Piercy H, Massey M-T, Gregory T. School nurses and sex education: surveillance and disciplinary practices in primary schools. *J Adv Nurs*. 2008;61:273–81. <https://doi.org/10.1111/j.1365-2648.2007.04495.x>.
67. Peskin MF, Hernandez BF, Markham C, Johnson K, Tyrrell S. Sexual Health Education from the Perspective of School Staff: Implications for Adoption and Implementation of Effective Programs in Middle School. *J Appl Res Child Informing Policy Child Risk*. 2011;2:40. http://digitalcommons.library.tmc.edu/childrenatrisk/vol2/iss2/9?utm_source=digitalcommons.library.tmc.edu%2Fchildrenatrisk%2Fvol2%2Fiss2%2F9&utm_medium=PDF&utm_campaign=PDFCoverPages.
68. Frank P, Didier J, Carine S, Dominique B. Les déterminants des pratiques d'éducation à la santé à l'école primaire: essai de catégorisation à partir du point de vue des enseignants. *Trav Form En Éducation*. UMR ADEF P3; 2010; <http://journals.openedition.org/tfe/1327>.
69. Deci EL, Ryan RM. The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychol Inq*. 2000;11:227–68. https://doi.org/10.1207/S15327965PLI1104_01.

70. Blanchette S. Le renforcement de l'autonomie professionnelle en début de carrière. Les compétences professionnelles en enseignement et leur évaluation. University of Ottawa Press; 2007. p. 53–66. ISBN 9782760318526.
71. Jensen RE. Sex Educators and Self-Efficacy: Toward a Taxonomy of Enactive Mastery Experiences. *Health Educ Behav.* 2012;39:259–67. <https://doi.org/10.1177/1090198111399756>.
72. Deppeler J, Aikens K. Responsible innovation in school design – a systematic review. *J Responsible Innov* Routledge. 2020;7:573–97. <https://doi.org/10.1080/23299460.2020.1809782>.
73. Ollis D. Planning and delivering interventions to promote gender and sexuality. *Bullying: Experiences and Discourses of Sexuality and Gender.* Routledge; 2013. p. 145–61. ISBN 9780415505024.
74. Jurkowski S, Ulrich M, Müller B. Co-teaching as a resource for inclusive classes: teachers' perspectives on conditions for successful collaboration. *Int J Incl Educ* Routledge. 2020;0:1–18. <https://doi.org/10.1080/13603116.2020.1821449>.
75. Duchaine EL. How to Plan for Success in Co-Teaching Environments. *Mastering the Art of Co-Teaching: Building More Collaborative Classrooms.* Vernon Press; 2020. p. 55–72. ISBN 9781622739455.
76. Scruggs TE, Mastropieri MA, McDuffie KA. Co-Teaching in Inclusive Classrooms: A Metasynthesis of Qualitative Research. *Except Child* SAGE Publications Inc. 2007;73:392–416. <https://doi.org/10.1177/001440290707300401>.
77. Desaulniers F. Enseigner en classe multiâge: le défi de développer des pratiques gagnantes pour nourrir son efficacité personnelle. Sherbrooke: Université de Sherbrooke; <http://hdl.handle.net/11143/7638>. Accessed 28 Jan 2021. 2015.
78. Lacono T, Landry O, Garcia-Melgar A, Spong J, Hyett N, Bagley K, et al. A systematized review of co-teaching efficacy in enhancing inclusive education for students with disability. *Int J Incl Educ* Routledge. 2021;0:1–15. <https://doi.org/10.1080/13603116.2021.1900423>.
79. Sinclair J, Kahn LG, Rowe DA, Mazzotti VL, Hirano KA, Knowles C. Collaborating to Plan and Implement a Sex Education Curriculum for Individuals With Disabilities. *Career Dev Transit Except Individ.* 2017;40:123–8. <https://doi.org/10.1177/2165143416670136>.
80. Vézina-Im L-A, Godin G. L'application des théories de prédiction pour les comportements liés à la santé. In: *Les comportements dans le domaine de la santé: comprendre pour mieux intervenir.* Montréal: Les Presses de l'Université de Montréal; 2012. pp. 187–208.
81. Godin G. *Les comportements dans le domaine de la santé: comprendre pour mieux intervenir.* Montréal: Les Presses de l'Université de Montréal; 2012.
82. Schwartz SH. Normative Influences on Altruism. *Adv Exp Soc Psychol.* Academic Press; 1977. pp. 221–79. [https://doi.org/10.1016/S0065-2601\(08\)60358-5](https://doi.org/10.1016/S0065-2601(08)60358-5).
83. Tabong PT-N, Maya ET, Adda-Balinia T, Kusi-Appouh D, Birungi H, Tabsoba P, et al. Acceptability and stakeholders perspectives on feasibility of using trained psychologists and health workers to deliver school-based sexual and reproductive health services to adolescents in urban Accra, Ghana. *Reprod Health.* 2018;15:122. <https://doi.org/10.1186/s12978-018-0564-x>.
84. Pound P, Langford R, Campbell R. What do young people think about their school-based sex and relationship education? A qualitative synthesis of young people's views and experiences. *BMJ Open.* 2016;6:e011329. <https://doi.org/10.1136/bmjopen-2016-011329>.

Figures

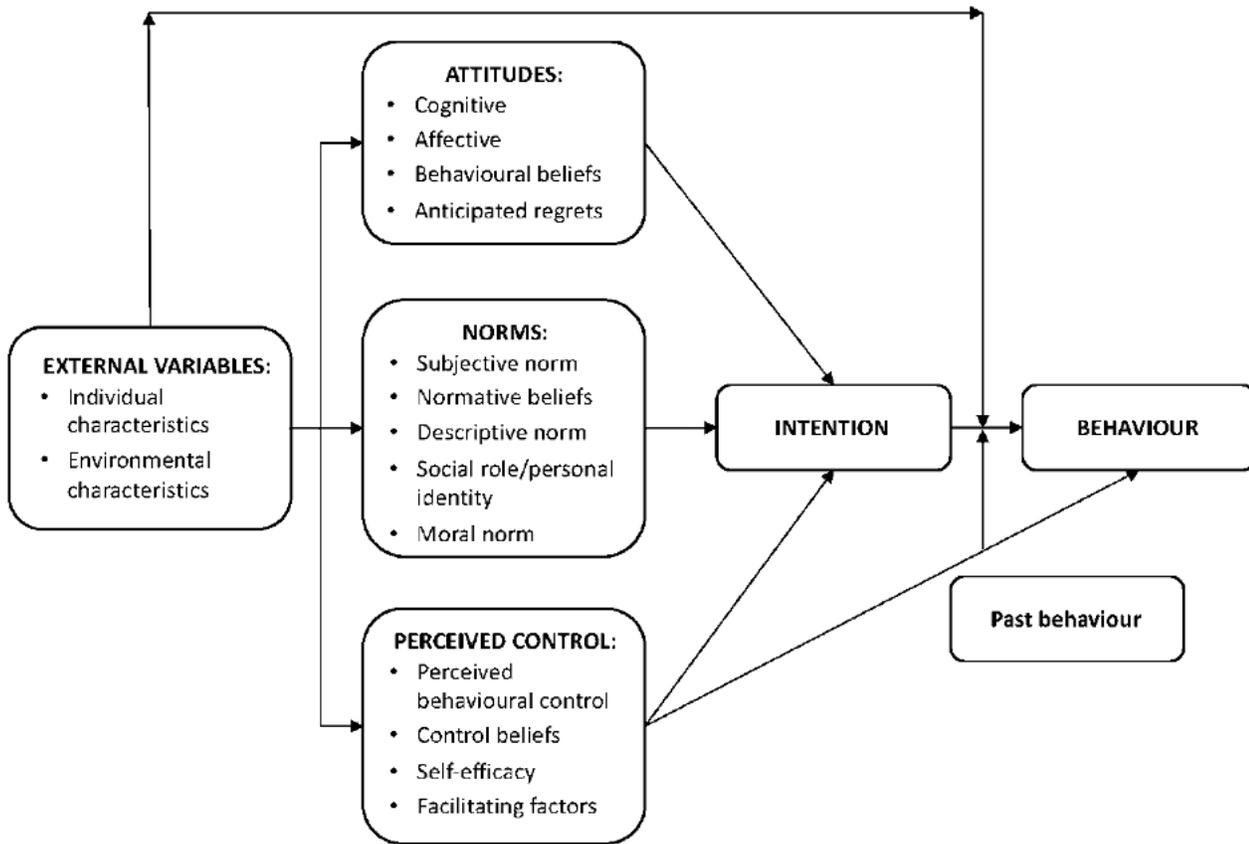


Figure 1

Integrative model of intention prediction (Godin, 2012)