
2-23-2019

How Should I Teach Sex Education in Middle School? An Action Research Study on an ICT-based Intervention

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Recommended APA Citation

Rojas Briñez, D. K., Galvis Panqueva, Á. H., & Flores Hinojos, I. A. (2019). How Should I Teach Sex Education in Middle School? An Action Research Study on an ICT-based Intervention. *The Qualitative Report*, 24(2), 405-428. Retrieved from <https://nsuworks.nova.edu/tqr/vol24/iss2/16>

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Abstract

In this article, we, Diana, Álvaro and Irma, present findings from an action research project aiming to promote self-care behaviors around sexual and reproductive health (SBSRH) in adolescents at a public school in Colombia through the use of ICT-based learning environments. I, Diana, the teacher-researcher carried out an action research study first reflecting on teaching practices for teaching healthy sexual behaviors, then assessing them in light of theoretical recommendations, and finally by creating a blended-learning project called "Self-Care in Action". Irma was the action-research advisor and Álvaro the ICT-research and development advisor. Two groups of 7th graders participated in the project. We collected and analyzed qualitative data to document changes in student behaviors and perceptions. Since the pedagogical intervention, a favorable change occurred in the students regarding their knowledge, attitude, and intention to practice SBSRH. The results shed light on the complexity of developing healthy sexual behaviors in adolescents and provide a guide for designing a meaningful class project to encourage this transformation. The findings here are relevant for teachers, health advocates and policy makers striving to create effective school-based sex education programs.

Keywords

Action Research, Reflective Practice, Healthy Sexual Behaviors, Sex Education, Technology-Based Education, Big-Ideas Approach for Teaching

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Acknowledgements

We would like to thank the Proyecto Formación de Talento Humano de Alto Nivel-Regional Tolima and the Universidad de los Andes, which helped to develop this study. We would also like to say thanks to Elvia Vargas for her advices on how to teach sex education at school.

How Should I Teach Sex Education in Middle School? An Action Research Study on an ICT-Based Intervention

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In this article, we, Diana, Álvaro and Irma, present findings from an action research project aiming to promote self-care behaviors around sexual and reproductive health (SBSRH) in adolescents at a public school in Colombia through the use of ICT-based learning environments. I, Diana, the teacher-researcher carried out an action research study first reflecting on teaching practices for teaching healthy sexual behaviors, then assessing them in light of theoretical recommendations, and finally by creating a blended-learning project called “Self-Care in Action”. Irma was the action-research advisor and Álvaro the ICT-research and development advisor. Two groups of 7th graders participated in the project. We collected and analyzed qualitative data to document changes in student behaviors and perceptions. Since the pedagogical intervention, a favorable change occurred in the students regarding their knowledge, attitude, and intention to practice SBSRH. The results shed light on the complexity of developing healthy sexual behaviors in adolescents and provide a guide for designing a meaningful class project to encourage this transformation. The findings here are relevant for teachers, health advocates and policy makers striving to create effective school-based sex education programs. Keywords: Action Research, Reflective Practice, Healthy Sexual Behaviors, Sex Education, Technology-Based Education, Big-Ideas Approach for Teaching

Introduction

Adolescence has been considered a risky stage in development because decision-making at this point can determine a person’s future (Bonino, Cattelino, & Ciairano, 2005); deciding whether or not to have a romantic relationship, whether or not to have sex, and whether or not to use contraceptive methods can decide the trajectory of one’s adult life (Vargas, Henao, & González, 2007). Moreover, adolescence is characterized by experimentation, a feeling of invulnerability, and impulsivity (Leal, 2008), all of which make adolescence as a time for risky behaviors like alcohol and drug use and sexual activity (Baumgartner, Valkenburg, & Peter, 2010). Sexual activity can be defined as a continuum of behaviors motivated by sexual desire and oriented towards pleasure and gratification (Barrera, Sarmiento, & Vargas, 2004). Many studies have indicated adolescents’ engagement in risky sexual behaviors such as early and unsafe sexual activity. In the United States, for example, 58.8% of students in grades 9–12 in 2015, reported having had sexual intercourse, and 11.5% had four or more partners. Furthermore, among the currently sexually active students in the United States, 52.2% of them reported not being sure if either they or their partner had used a condom during their last sexual intercourse (Frieden, Jaffe, Cono, Richards, & Iademarco,

2016). Additionally, it is estimated that more than 2.1 million people are living with HIV/AIDS in Latin America and the Caribbean; among them, 250,000 are youth between the ages of 15 and 24. Five countries account for two-thirds of these cases in the region: Argentina, Brazil, Colombia, Haiti, and Mexico (Vivo, López, & Saric, 2012).

In response to these concerns, efforts to promote self-care behaviors around sexual and reproductive health (SBSRH) are expanding. These kinds of initiatives are aimed at encouraging wellbeing and consist in having regular medical examinations, doing breast and testicle self-exams, taking measures to avoid contracting and spreading sexually transmitted infections (STIs) (Vargas, 2007), maintaining genital hygiene (López et al., 2015; Santucci, Kim, & Terlecki, 2005), and postponing an early start of penetrative sexual activity. Regarding the latter, it has been established that adolescents who initiate sexual activity at earlier ages have a propensity to have unprotected sex, which increases their risk of acquiring STIs (Montero, González, & Molina, 2008), cervical cancer, and unintended pregnancy (Lammers, Ireland, Resnick, & Blum, 2000).

To promote SBSRH there are different sex education programs and their focus depends on young people's needs and their cultural and socio-economic conditions. In Europe, for instance, sex education remains focused on preventing teenage pregnancies and STIs, including HIV, but nowadays policies appear to be more conducive to the promotion of young people's sexual health (Iyer & Aggleton, 2015). In some regions of Africa, policies outline actions to prevent and mitigate the impact of HIV/AIDS, other STIs and tuberculosis. This is implemented through sex education in schools, particularly with pedagogy and curricula in the Life Orientation or Life Skills field (Adams, George, Reardon, & Panday, 2017; Rashid & Mwale, 2016). In contrast, the United States' policy regarding the dangers of premarital sex is a mandated component of federally-funded sex education (Bay-Cheng, Livingston, & Fava, 2011). This is called abstinence-only-until-marriage education. Nevertheless, in 2010, the Obama administration began supporting comprehensive sex education, which is based on a permissive sexual ideology; since sex is seen as a biological act, these curricula aim to provide teens with appropriate information and decision-making skills so they can take responsibility for their own lives (Ives, 2017). Finally, in Latin America and the Caribbean, the sex education legislation in most countries focuses on one of these objectives: prevention of adolescent pregnancy and STIs (specifically HIV); prevention of sexual, gender or domestic violence; education on rights; and gender and diversity (Baez, 2015).

Regardless of the fact that school-based sex education is a growing concern for both national policy makers and international health organizations (Hodzic, Budesa, & Stulhofer, 2012), interventions with adolescents have mainly come from the health field; few come from schools (García, Cañadas, González, Fernández, & García, 2011). School-based programs are uncommon (Hodzic et al., 2012) even though adolescents spend a great deal of time at school (six hours per day in Colombian public schools) and studies show teachers are important agents for health promotion (Baraldi, Daud, Almeida, Gomes, & Nakano, 2007). Schools and educators clearly have a role to play in adolescents' psychosocial and physical well-being (Giese, Meintjes, & Monson, 2005). Furthermore, Social Learning Theory predicts that adolescents will be better able to avoid negative sexual outcomes if education programs give them a chance to both observe healthy and unhealthy types of behavior and to practice these behaviors through imitation and role-playing exercises with knowledgeable teachers (Chi, Hawk, Winter, & Meeus, 2015; Eisen, Zellman, & McAlister, 1990).

In Colombia, sex education is mandatory and should respond to the psychological, physical and affective needs of students (Congress of the Republic of Colombia, 1994). The decree 1860 of 1994 establishes that sex education should be framed within cross-curricular projects, meaning that teachers are directly responsible for teaching it; they must include sex education as part of the content of their discipline. The following are examples of this

integration: a social sciences teacher who includes the topic of sexual and reproductive health rights in his or her class; a mathematics teacher who teaches how to analyze statistics related to sex (e.g., pregnancy rate in adolescents); a science teacher who teaches the biological dimension of sexuality (human reproduction, contraceptive methods, STIs). However, what happens in reality is quite different; sex education is often only addressed in the science classroom. For this reason, when sexually-risky behaviors occur in adolescents at school, the responsibility tends to fall on science teachers alone.

About the Action Research Study on an ICT-Based Intervention

Self-Questioning and Attempts to Change my Teaching

As a science teacher at a public school in Ibagué, Colombia, I, Diana, have had to teach sex education to 7th grade students, focusing primarily on the biological dimension. I have always hoped to promote healthy sexual behaviors in my students and guide them to make autonomous, successful decisions and to avoid risky situations. In spite of my efforts, I began to observe how cases of teenage pregnancies was increasing annually at the school, and I began to wonder, “Am I succeeding with this approach?” I thought, “Maybe if I had included more content about contraceptive methods...” or, “If I had dedicated more class time to sex education...” the situation would be different.

Pressure began to build in 2012. While I created a pedagogical project about the number of school drop-outs, I realized the unvarnished truth: it was common in the neighborhood where the school was located for female adolescents to cease their studies in order to fulfill their obligations as single mothers. This reality is tied to other situations like high rates of unemployment, poverty, low parental education levels, gangs, drug use and intra-family violence. These are all conditions related risky sexual behaviors in adolescents (Baraldi et al., 2007; Izugbara, 2008; Rob, Ghafur & Bhuiya, 2006). Initially, I changed my educational practice through the inclusion of Information and Communication Technologies (ICT). My use of ICT included good digital presentations and access to relevant digital resources; I took this approach because I thought it would attract the attention of my students and they could learn more about sex and change their behaviors. However, this change was not enough. I observed that the problem was broader than this. Students did not know proper genital hygiene habits, those who had penetrative sexual activity had not used contraceptive methods, and the majority of students talked about having sex with strangers (Maldonado & Rojas, 2012). These are all factors that could adversely affect their sexual and reproductive health.

It was at this point that I began to wonder how, as a teacher-researcher, I could encourage SBSRH in my students. Specifically, while I was doing my Master of Education at the Universidad de los Andes, Colombia, I recognized that I should not only try to change others, but that I should see myself as part of the problem and intervene to improve this. Thus, I decided to reflect on my own teaching practices and discovered that I had erred in a way that even promoted such behaviors: I taught only the biological dimension of sex, I used ICT inefficiently, and I did not identify and build on my students’ learning needs.

Through interaction with my project advisors, Irma and Álvaro, I identified that “*In my teaching practice, I have difficulties promoting SBSRH in my students.*” As a consequence, the question that guided the action research was “*How do I improve my teaching practices using ICT in order to encourage SBSRH in my students?*”

To answer the question, my two research advisors and I agreed that the following research sub-questions should be solved:

1. How coherent was my teaching of SBSRH with the academic literature on the topic?
2. How could I encourage SBSRH in my students using ICT-based teaching practices?
3. How do my ICT-supported teaching practices promote SBSRH in my students?

This action research on an ICT-based intervention provides a guide to designing a meaningful class project to encourage healthy sexual behaviors in adolescents. Other teachers, health promoters, or policy makers who read this document will have the opportunity to reflect on and change their own practice in order to achieve this goal. Finally, this research presents phases to promote SBSRH, factors that influence adolescents to change their sexual-risk behaviors to healthy ones, and the barriers to adopting SBSRH, all of which can serve in the creation of effective school-based sex education programs.

Researchers' Backgrounds

I, Diana, have always been interested in teaching sex education, and I am fully aware the importance of the effective inclusion of ICT to achieve this goal. I became interested in encouraging SBSRH while doing my Master's in Education. At that moment, I became a classroom researcher thanks to the support of my university mentors, Álvaro and Irma, the other authors of this article, who performed key roles throughout the research initiative.

I took a course called Moderation of Interactive Learning Environments from Álvaro Galvis, who is a full professor from the Computer Science Department and was awarded a doctorate in Education. In this setting, and in the framework of my research project, with the guidance of professor Galvis, the second author of this study, I designed and pilot-tested an ICT-based blended learning environment to promote SBSRH. Afterwards, I revised and implemented this innovation with professor Galvis supervision. Every two months for almost two years he monitored and provided feedback regarding the research process, from the educational-technology perspective.

Irma Flores is an instructor from the Faculty of Education, whose scholarship of teaching is dedicated to improving teaching-learning processes at different levels of education by using action-research. She acted as my advisor about methodological decisions through the process. Reflections shared with her helped me improve my way of teaching.

From the content perspective, professor Elvia Vargas Trujillo, who has a doctorate in Methodology of Behavioral Sciences and leads the research group "Sexuality and Family" at the Psychology Department from Universidad de los Andes was an expert advisor on teaching sexuality. She drove me through the literature review concerning sex education and gave me feedback when in the analysis of findings concerning sex-education.

Literature Review

Overview of Studies Related to Educating Adolescents on Healthy Sexual Behaviors

Sex education is a person's right to seek and obtain verified and opportune information about his or her sexual dimension in order to acquire the necessary knowledge, attitudes, and skills to make autonomous sexual decisions and to developed self-care, mutual-care, and environmental-care practices (Vargas, 2007). One of the purposes of sex education is to promote SBSRH, which is achieved through: facilitating access to current, evidence-based information, promoting recognition and exercising sexual and reproductive health rights and

encouraging critical analyses of varied contexts to clarify attitudes that favor or hinder peoples' adoption of healthy sexual behaviors (Vargas, 2007).

Additionally, there are other factors contribute to the formation of SBSRH in adolescents. One is personal attitude, which is the result of the adolescent's evaluation of the behavior, that is, whether he or she believes it is beneficial or harmful, pleasant or unpleasant (Vargas, 2007). The perceived social norm also affects sexual decisions and consists of the adolescent's perception of peer and parent attitudes toward the behavior, as well as his or her perception of the number of peers that practice it (Barrera et al., 2004). Other factors to be taken into account are self-efficacy, perceived barriers, and self-esteem. Self-efficacy is how competent a person feels to carry out the behavior; perceived barriers refer to the assessment of the degree of difficulty to practice it (Vargas, 2007); and self-esteem is the value people give to themselves. It has been shown, for example, that adolescents with higher self-esteem tend to postpone precocious sexual intercourse (Vargas, Gambará, & Botella, 2006).

Many studies have been done training on adolescents in healthy sexual behaviors, but most come from the healthcare field. In this field, sex education programs tend to be extracurricular. These programs consist of pedagogical interventions such as workshops, group dynamics (García et al., 2011), courses, film screenings, and exhibitions (Castañeda & Moreno, 2010). These studies have primarily focused on topics such as the biological dimension of sexuality: sexual development, experiencing body changes with their implications, fertilization (García et al., 2011), sexual organs (Adams et al., 2017), reproduction, contraception, condom use, and STIs. Unfortunately, there is a dearth of studies that include other components affecting sexual decision-making in adolescents, such as body satisfaction, self-concept, self-esteem, sexual role ideology, and attitudes toward sexuality (Carrera, Lameiras, Foltz, Núñez, & Rodríguez, 2007).

With respect to school-based sex education projects, there has been very little research on teaching healthy sexual behaviors and much less on innovative strategies such as the effective inclusion of ICT in teaching this. Pérez (2012), for example, created a youth radio magazine for the prevention of teenage pregnancies. Apfelbacher et al. (2010) designed a learning scenario about sexual health in a blended learning modality which contains modules where adolescents can choose the topic of interest according to their needs. Similarly, Gabarrón, Serrano, Wynn, and Armayones (2012) developed a virtual clinic to raise awareness of STIs through the creation of avatars and the possibility of sharing information on social media.

In accordance with those studies, some recommendations emerge. It is essential to combat erroneous beliefs (García et al., 2011), to develop programs adapted to the adolescents' needs (Castañeda & Moreno, 2010), and to focus on real sexual and reproductive health situations (Pérez, 2012). Besides, it is important to stimulate senses, emotions, reflection, and discussion to focus on delaying sexual activity (Niño et al., 2012), to use diverse interactive activities, and to identify social influences as well as strategies to respond to these pressures (Estrada, 2009). In general, qualitative, meta-analytic studies addressing the design of appropriate interventions for adolescents in sexual and reproductive health indicate that providing information only raises awareness; it does not meaningfully change behavior. Hence, interventions with the greatest effects on behavior include social-emotional components (Vivo, López, & Drina, 2012).

Effective Inclusion of ICT in Teaching Practices

Because we wanted to improve my teaching practices through the inclusion of ICT, we considered it pertinent to discuss how ICT can be effectively used in teaching and learning processes. There are many studies that address the use of technology in education, and we are

at a moment when its implementation in the classroom is common. Cell phones, tablets, and laptops are among the most widely used instruments, and online teaching and blended learning modalities are becoming more common. Nevertheless, the fact that technology is used does not necessarily constitute innovation, nor does it necessarily raise the quality of teaching processes. It is the way technology is used that creates innovation (Lau González, Jáuregui Haza, & Fariñas León, 2012).

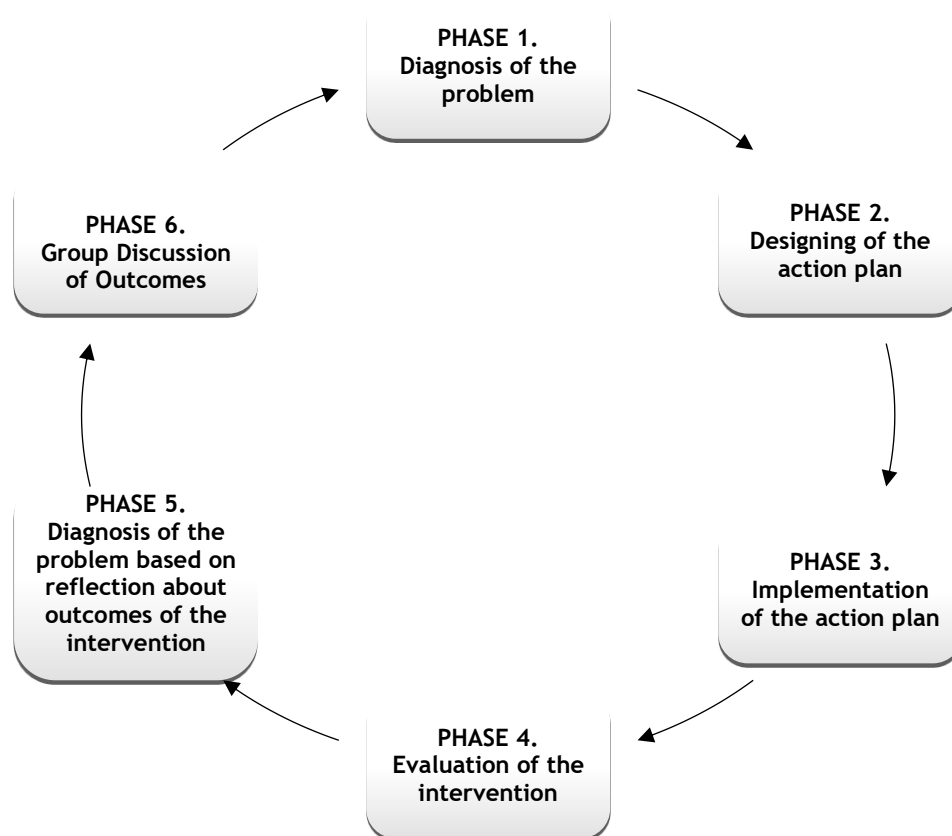
Research findings about effective inclusion of ICT in teaching and learning indicate that there must be three main elements: learner control over the learning process; teacher as a co-learner and facilitator of the learning process, and diverse ways of learning are available (Galvis, 2010). In addition, studies by Forté (1998) show that ICT for teaching and learning can be used in three complementary ways: in expository mode (teachers effectively transmit information), active mode (learners explore learning objects with organic behavior and acquire knowledge from the demonstrated activity), and interactive mode (learners build knowledge through technology-based interactions).

Concerning how to construct active-learning digital environments, Galvis and Pedraza (2012) propose an innovative approach that has proven effective. It details how to use a big ideas approach (Hansen, 2011) to promote comprehension (Erickson, 2007) while integrating ICT in this methodology, students understand fundamental concepts, apply them in solving authentic problems by means of inquiry and collaborative work using technology to support learning. The implementation of this methodology changes the paradigm from working on great a great number of topics to focusing on only several key concepts: big ideas. This proposal includes a backward systematic design of learning environments, starting with what must be learned, to how to assess it, and finally how to teach it with full instructional alignment (Wiggins & McTighe, 2005).

Research Methodology

The intervention used a systematic approach to action research. Restrepo et al. (2011) stated that action research is a way of exploring a social situation with the purpose of improving it. Those involved in the research are seen as inquirers, including teachers and students, with the aim of improving the quality of action. In the case of the current study, I was involved both as a participant and as a researcher and the other authors had the role of researchers. Additionally, we choose this methodological approach because it is structured using continuous open cycles of the research process, which enables action to be carefully monitored, analyzed, and evaluated, with the possibility of modifying it (Street, 2003). It allowed us to make decisions during the research process to improve both the teaching practices and to encourage SBSRH in the students. Moreover, studies have found that one of the outcomes of action research is that teachers can observe if a given curriculum, instructional strategy, or use of technology will positively affect (or not affect, or negatively affect) student outcomes (Mills, 2003). It was important for the research purpose to understand how teaching practices supported by ICT affect the promotion of SBSRH in the students.

Action research is also conceived of as a spiral that expands and deepens as the research acts and reflects on the process (Evans, 2010). Carefully planned iterative cycles offer an increasingly detailed picture of the problematic situation and aid in finding a solution to this problem (Davison, Martinsons, & Kock, 2004). Norton (2009) sees this spiral as a five-step process: identifying the issue, considering ways to address the problem, taking the necessary actions to correct the problem, evaluating the effects, and modifying the way things are done to correct the problem. The phases of this study are illustrated in Figure 1:

Figure 1. Phases of this action research

Through reflection on my teaching practices and the coherence between these practices and the academic literature (Phase 1), I was able to identify my mistakes in promoting SBSRH. Then, in accordance with the recommendations of previous studies and assessment of the educational needs of my students, we designed the pedagogical intervention supported by ICT (Phase 2). After, we implemented it (Phase 3) and evaluated how the intervention promoted SBSRH in the students (Phase 4). Immediately, we identified the elements that needed to be modified in the intervention, recommending improvements for the next application (Phase 5). Finally, we discussed outcomes of the study in academic meetings (Phase 6).

Participants

The study participants included 66 adolescents from Ibagué, Colombia who were in 7th grade in 2015. The mean age of the participants was 13, with a range between 12 and 16; 64% were male and 36% female. The students were distributed into two 7th grade classes with sections 3 and 4, with 33 students in each class. We chose these participants for three main reasons: pregnancy cases had been reported starting in this grade, SBSRH teaching had been stipulated in the science curriculum for 7th grade, and there were five instructional hours per week with each section which allowed us to have a deeper understanding of the context and participants. Regarding access to technological resources, more than 78% of students had their own computer, laptop or tablet, and more than 71% had internet at home. They mainly used this for social networking sites, email and Microsoft (Word and Power Point).

With regards to ethical considerations, approval for the study was granted from the rector of the school where the research was carried out. Additionally, before we collected the data, we informed participants and their parents about the significance and purpose of the study, my role as a teacher and researcher, methodology, and data collection instruments. Moreover,

we collected written informed consent applicable for students and parents informing them of confidentiality, anonymity and voluntary nature of participation. We have changed the participants' names to pseudonyms to maintain their anonymity.

Acquiring Information

We applied diverse data collection instruments that are specified in the following Table:

Table 1. Data Collection Instruments

Main Research Question	Sub-ordinate Research Questions	Data Collection Instruments
How do I improve my teaching practices using ICT in order to encourage SBSRH in my students?	How coherent was my teaching of SBSRH with the academic literature on the topic?	<p><i>Literature review:</i> We reviewed studies on how to promote SBSRH in adolescents. After, we organized the recommendations to compare them with my teaching practice in 2014.</p> <p><i>Document analysis:</i> We analyzed my class plans as well as the Power Point and Prezi presentations I produced for promoting SBSRH in class in 2014. This was done to find the level of coherence between what was proposed by previous studies on how to teach these behaviors and my teaching practice.</p>
	How could I encourage SBSRH in my students using ICT-based teaching practices?	<p><i>Literature review:</i> We reviewed studies about how to effectively incorporate ICT into teaching practices. Then we proposed the intervention according to the findings.</p> <p><i>ICT use survey</i> (available in https://drive.google.com/open?id=1cZ3DuHzsxqUadheJdQnMwM-ME4UxDY1s): The purpose of this tool was to identify the resources and abilities of the students regarding ICT.</p> <p><i>SBSRH Educational needs questionnaire</i> (available in https://drive.google.com/open?id=1t5xT52abvxS097kooC-Y5IE7929sRVHU): We obtained information from my students related to predictive factors of sexual activity: sexual activity, intentions of having sexual intercourse, and knowledge of self-care practices (adapted from Barrera, Sarmiento, & Vargas, 2004; Vargas, Barrera, Burgos, & Daza, 2005). With this information in mind, we designed an intervention pertinent to participants' needs.</p>

How do my ICT-supported teaching practices promote SBSRH in my students?	<i>Document analysis:</i> We analyzed the documents developed by students during the pedagogical intervention to find evidence of SBSRH formation.
	<i>Participant observation, research journal and, class videos:</i> We observed my classes during the intervention. In my research journal, I documented my thoughts, experiences, reflections, students' actions, and interpretations concerning to the research question. In addition, we filmed all classes.
	<i>Intervention evaluation questionnaire (available in https://drive.google.com/open?id=1k5eY-hOtWlEFtRsPPo3l1Qpi5x8clUHH):</i> This questionnaire was given with the aim of knowing the students' opinions about the intervention and the changes in SBSRH.
	<i>Focus group:</i> We used this group for the enrichment and exploration of the interpretation of research results (Morse, 2005). It was done with six volunteer participants; the questions can be found in this link https://drive.google.com/open?id=1jrOYngVRa4BoXmfmfSy9Xi3dQr2Rlk-W2 .

Data Analysis

We, the authors of this study, continuously analyzed data throughout the process. These analyses were essential for the choices made. For the purpose of understanding the analysis, here we will present the process in a specific order.

After the literature review, we established interim categories to assess my teaching practice for SBSRH training; this aimed to identify the coherence between my teaching and the previous studies' recommendations, and to understand the learning needs of my students for developing the pedagogical intervention. Then these categories were modified or merged with others while we examined the data: we watched the class videos, listened to audio recordings of the focus group, and read and reviewed information obtained by the different instruments. Because the majority of information was written, we only transcribed audio and video recordings. We thoroughly reviewed all data three times, looking for unnoticed features.

The categories emerged from there on: recurrent and relevant themes were identified and organized into codes that pointed to either my practice or to ways to assess changes in students related to SBSRH. Subsequently, we organized the information into emergent categories and triangulated the data (Gurdián, 2007). In this research, the triangulation was done using different sources (my students and I) and the methods of data collection (the instruments are shown in Table 1). Furthermore, all authors and student participants of the focus group participated in member-checking of the interpretations as a validity measure. The data from surveys and questionnaires were analyzed in order to understand students' learning needs and their opinions in planning the intervention.

Through the analysis, eight categories emerged: 1-4 focused on my teaching practice and 5-8 highlight participants' changes. These categories were: (1) content, (2) teaching

strategies, (3) previous ideas, (4) effective use of ICT in teaching, (5) knowledge, (6) personal attitude, (7) intentions to practice SBSRH and (8) behaviors.

Findings and Discussion

The purpose of this action research was to understand my teaching practice and to change it to encourage SBSRH in my students. To achieve this goal, it was necessary to answer the three research questions, thus, the findings of the study are presented in three parts, one for each question. The first part describes my practice before the action plan, the second part illustrates how to encourage SBSRH with the support of ICT, and the third part presents the changes the intervention made in my students.

Before the Action Plan: How Coherent was my Teaching of SBSRH with the Academic Literature on the Topic?

Once we carried out the literature review, we analyzed my teaching practices for teaching SBSRH in 2014, reflecting on how I promoted these behaviors in my students in accordance with what studies recommended. In this context, we constructed the following categories: content (a set of knowledge adolescents should assimilate to make informed autonomous decisions about their sexual and reproductive health), teaching strategies (procedures and/or resources I used to promote meaningful learning), and previous ideas (my assumptions about the students and about what and how to teach).

From the content suggested by previous studies, I only included topics related to biology. Sexuality is the way we describe ourselves in three aspects: sex, gender, and sexual orientation (Vargas, 2007). It is also constructed with biological, psychological, and social dimensions (Programa de Educación para la Sexualidad y Construcción de Ciudadanía¹, 2010). However, I only focused on teaching the biological dimension of sexuality, assuming the other content was not important in science classes, nor was it my responsibility to teach it. In my mind, it was the responsibility of other subjects such as ethics and social sciences to deal with this dimension.

In the following table, we present the content proposed by previous studies to be included for teaching healthy sexual behaviors and which of these topics I included in my teaching practice in 2014.

Table 2. Topics recommended by previous studies vs. topics I included in my classes in 2014

Topics recommended by empirical research	Topics I included in my classes in 2014
Sexual and Reproductive Health Rights: knowledge and practice (Vargas, 2007)	Not included
Sexuality: what is it? aspects and dimensions (García et al., 2011)	Not included
Sexual role ideology (Carrera et al., 2007)	Not included

¹ Program for Sexuality Education and the Construction of Citizenship

Sexual development (García et al., 2011)	Included: puberty, definition, and changes observed in both women and men (Biology Class Plan, 9 April 2014).
Body satisfaction, self-concept, self-esteem (Carrera et al., 2007)	Not Included
Human reproduction (Carrera et al., 2007)	Included: functions and importance of human reproduction, reproductive system, menstrual cycle (Biology Class Plan, 14 and 21 April 2014).
Fertilization (García et al., 2011)	Included: fertilization (Biology Class Plan, 14 May 2014).
Adolescent pregnancy (Pérez, 2012)	Not Included
Consequences of unprotected sexual activity and how avoid it (Estrada, 2009)	Included: pregnancy (gestation), contraception methods, STIs, abortion, life project. (Biology Class Plan, 14 and 26 May 2014, 1 August 2014).
Self-care practices of Sexual and Reproductive Health (Vargas, 2007)	Included: genital hygiene, breast and testicle self-exams, vaginal cytology and prostate exam. (Biology Class Plan, 28 April 2014).
Peers' social and media influences that favor unprotected sexual activity, strategies to respond to these pressures (Estrada, 2009)	Not Included

Teaching strategies to promote healthy sexual behaviors are numerous (see Table 3). It is suggested, for example, that teaching these behaviors should be focused on the learner, be primarily interactive (as opposed to expository), and focus on problem solving in real contexts and scenarios where adolescents can choose the instructional course to take according to their interest. However, in 2014 my classes were teacher-centered and focused on transmitting theoretical content. As illustrated by Galvis (2012), this does not encourage information processing by students, nor does it help them to build on what they already know or practice those behaviors. The only recommended teaching strategy I implemented in my classes was the identification of beliefs that students have about sexuality (Vargas et al., 2005), but I did not identify their learning needs. Designing teaching strategies without taking into account the age of my students, their needs, beliefs, and the norms prevailing in the group could have an effect opposite than what I hoped, for instance, encouraging early onset of sexual activity (Barrera et al., 2004).

Table 3. Pedagogical strategies recommended by other studies to promote healthy sexual behaviors vs. pedagogical strategies I used in 2014.

Pedagogical strategies recommended by other studies to promote healthy sexual behaviors	Pedagogical strategies I used in 2014 to promote healthy sexual behaviors
Having accurate information about the age range is relevant to defining appropriate content and strategies (Vargas, Cortés, Gallejo, Maldonado, & Ibarra, 2013)	Not included
Identifying beliefs adolescents have about sexuality (Vargas et al., 2005)	I identified it through a box where students put anonymous questions concerning sexuality.
Considering cognition (peers norm, perceived social norm) (Barrera et al., 2004), principles, ideas, expectations, and other norms which prevail in the group (Vargas, Gambará, & Botella, 2006)	I only identified my students' beliefs about abortion through a class discussion.
Counteracting erroneous beliefs or myths about sexuality (García et al., 2011)	Not included
Developing pedagogical interventions, taking into account the needs of students. Otherwise, perceived social norms (perception of friends' attitudes and of peer norms) (Barrera et al., 2004) could incite young people to early onset of sexual activity	Not included
Foster a critical position in adolescents that allows them to question what is taken for granted (Barrera et al., 2004)	Not included
Stimulate emotions and promote reflection and discussion of concrete situations that involve experiences of students and that cover topics of interest in sexuality (Niño et al., 2012). Foster genuine problem solving (Pérez, 2012)	Not included
Strengthening of skills and attitudes that allow young people to practice their knowledge. Topics related to anatomy and physiology would not be omitted, but rather their learning could occur in programs where reflection and debate about the meaning and value of knowledge acquired by adolescents is promoted (Niño et al., 2012)	Not included
Indicate the easiest, and most effective ways to carry out self-care behaviors. That knowledge promotes self-efficacy and counteracts perceived barriers (Vargas, 2007).	I presented information about self-care behaviors, but I did not apply strategies to counteract perceived barriers.

Expose the negative results of unhealthy behaviors. Willingness to adopt self-care practices is determined by the personal attitude toward the behaviors and anticipation of negative outcomes or expectations of negative effects (Vargas, 2007).	I only exposed the physical consequences of unprotected sex, like the transmission of STIs.
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Before the action plan, I held the belief that about half of my students had participated in penetrative sexual activity; however, studies indicate that only 31% of young people between 12 and 18 years old have participated in this activity in Colombia (Barrera et al., 2004). This belief that the majority of young people have penetrative sexual activity may be a factor that motivates adolescent, who have not had early onset of sexual activity to think they are part of a minority. Therefore, this could lead them to feel that they would like to do what they perceive as a norm for their peers (Barrera et al., 2004). For this reason, my classes could have a contradictory effect; when I taught how to use contraceptive methods in a course where the majority had not had sexual intercourse before, students could think I explained it because a greater number of their peers had already had this experience. Consequently, they could be feel pressured to initiate precocious sexual activity.

The Action Plan: How Could I Encourage SBSRH in my Students Using ICT-Based Teaching Practices

In answering the first research question, we obtained important guidance about how to promote healthy sexual behaviors in adolescents with teaching practices based on ICT. This information was used to plan the intervention, but it was not enough. It was also necessary to know the learning needs and technology abilities of my students (through the SBSRH educational needs questionnaire and the ICT use survey, respectively). So, we chose technology tools based on which would be best for the students, exploring the resources and strategies in the tools that would allow students to acquire the knowledge. According to the information obtained, the categories that we constructed to answer the second research question were: content, teaching strategies, and effective use of ICT in teaching.

The action plan was designed with the content proposed by studies: sexual and reproductive health rights, sexuality, sexual role ideology, sexual development, human reproduction, fertilization, adolescent pregnancy, consequences of unprotected sexual activity and how avoid it, and self-care practices of sexual and reproductive health. In regards to teaching strategies, we implemented those specified in the studies; thus, they were based on accurate information about the age range, my students' needs and their beliefs (with the educational needs questionnaire), and indicated the effective routes for practicing self-care behaviors (through readings and videos). In addition, we stimulated their emotions, propitiated reflection, held discussions about concrete situations (with discussions in VoiceThread), and countered their erroneous beliefs about sexuality (through a box with anonymous questions concerning sexuality).

With respect to the use of ICT, we considered that the big-ideas design methodology was the most convenient for the design of the course since it meets all elements of effective use of ICT in teaching. First, with this approach, the learner has control over the learning process; second, the teacher is a co-learner and facilitator of the learning process; and finally, diverse ways of learning are possible (expository, active and interactive) (Galvis, 2010). When we started to apply the action plan, I wrote about the benefits of this methodology in my research journal: "In general, I feel that the class is more participative, and I am surprised by the attitude that some students had, that they did the work with passion" (Research journal, 20 May 2015). Moreover, I reflected on my new role as a learning facilitator: "At the beginning,

this methodology made me feel scared. I was not sure, and I had a lot questions, but it is interesting to see how good it was to give my students control of the learning process. Sometimes I think they are alone because I don't have all the control, but results of the classes are better" (Research journal, 15 May 2015).

Students also expressed benefits of strategies used by big-ideas methodology, as demonstrated in the following exchange.

Alfredo: It was the first time I did an assignment on the laptop like this.

Enrique: Yeah, we had never done assignments in class on the laptop.

Alfredo: We had never done something like that, but now we know how do it.

Teacher: Mmmm, what else do you have to say about the course?

Pedro: That we learned to make cartoons, on the website Toondoo (...)

Alfredo: And we learned to work in a team. (Focus Group Answers, 2016)

The action plan was a course called Self-care in Action, *Autocuidado en Acción* in Spanish (available in: <http://dianakarinarojas.wixsite.com/autocuidadoenaccion>). The big idea (a fundamental concept to understand) of the course was that "adopting self-care behaviors promotes the maintenance of sexual and reproductive health" and was composed of three learning units. Unit 1: Understanding sexual and reproductive human rights allows me to make autonomous decisions regarding my sexual life, considering myself and others' welfare; Unit 2: understanding sexuality, meaning the biological processes involved in its development, allows me to identify and recognize myself as a vulnerable person when I am in risky situations in relation to sexual and reproductive health; and Unit 3: It is necessary to adopt SBSRH. These guarantee a general state of well-being in my life.

The length of the pedagogical intervention was six and a half weeks, from April to June of 2015; each week, the intervention used three hours of biology class. Moreover, we used learning activities from a National Government of Colombia program, particularly from a pedagogical project entitled Education for Sexuality and Construction of Citizenship (available in <http://www.colombiaaprende.edu.co/html/productos/1685/w3-propertyvalue-46041.html>). The intervention was designed to promote the students' participation at two moments: non-classroom teaching and classroom teaching. Students were required to read written texts or watch videos at home (informing process), then they shared their opinions in class in groups of three people (discussing process), and finally they did a collaborative assignment (evidence of learning). The number of students per group was due to the fact that there were not enough laptops at school for each student to have his or her own. The course tasks were diverse: expository, active, or interactive. The students always had instructions and rubrics that guided their course activities.









Results of the Action Plan: How do my ICT-Supported Teaching Practices Promote SBSRH in my Students?

Assessing the diverse instruments to obtain information, we constructed four categories that indicated promotion of SBSRH in the students: knowledge, personal attitude, intentions to practice SBSRH and behaviors. In the case of behaviors, these are "expressions or manifestations of the individuals that are observable" (Vargas, 2007, p. 19), while the intention to practice the behavior is the best predictor of it, according to the theory of planned behavior (Ajzen, 1988, 1991).

Students' knowledge improvement was related to the number and type of activities supported by ICT and the number of class hours allocated to each learning unit. Students said that the most important take-way from the course was sexual and reproductive health rights

which was addressed with expository, active, and interactive activities in 10 class hours. They successfully exemplified real cases of infringements on rights in their community, as can be seen in the following comic strips students produced in Toondoo:

Figure 2. Four Panel Comic Strips Produced in Toondoo by Students

		<p>Panel 1 <u>Father:</u> Son, what are you doing? <u>Son:</u> Playing daddy. <u>Father:</u> That toy is not for boys. <u>Son:</u> Dad, it doesn't matter. It doesn't change my sex or my personality.</p>	<p>Panel 2 <u>Father:</u> Look, Lina. Andres plays with dolls. Those are not for boys. <u>Mother:</u> It doesn't matter. It doesn't change his personality or way of thinking.</p>
		<p>Panel 3 <u>Mother:</u> Son what happen? Why are you acting so strange? <u>Son:</u> Mom, people discriminate against me because I do girly things, even my dad. <u>Mother:</u> Don't worry, you have the right to express yourself how you want to.</p>	<p>Panel 4 <u>Son:</u> Being different is not a problem. The problem is being discriminated. No more discrimination.</p>
		<p>Panel 1 <u>Husband:</u> Let's go out now!!!! <u>Wife:</u> I'm coming. Leave me alone.</p>	<p>Panel 2 <u>Husband:</u> Let's go home now!!!! <u>Wife:</u> I don't want to go, ashh</p>
		<p>Panel 3 <u>Wife:</u> Leave me in alone. Help me!! Anyone! Help me!!! <u>Husband:</u> Shut up!</p>	<p>Panel 4 <u>Husband:</u> I will kill that bch. <u>Police officer:</u> Let's go now!!</p>

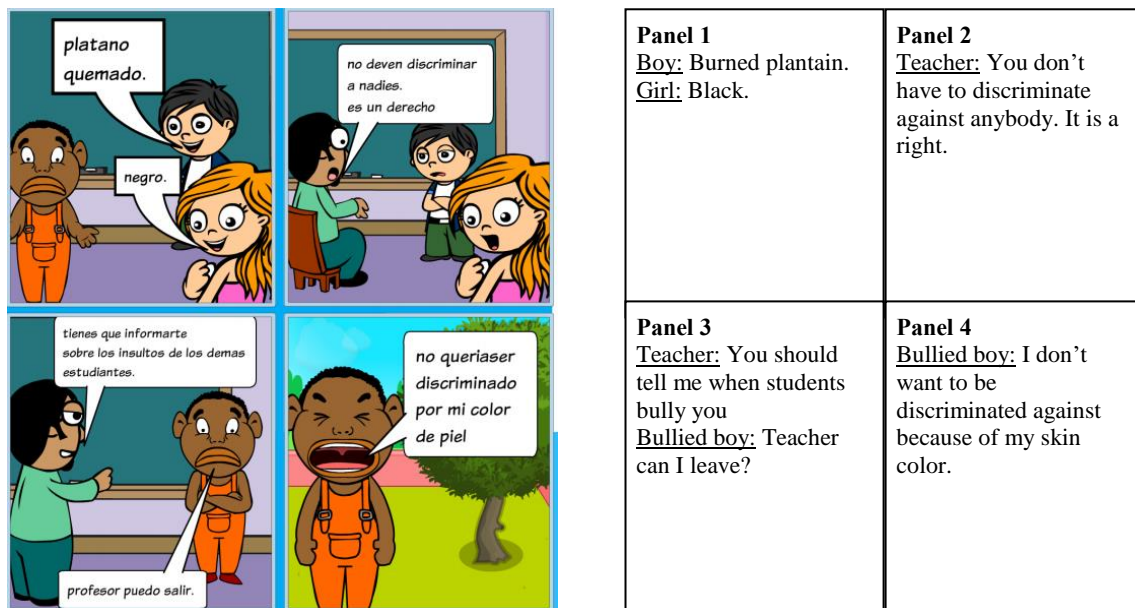


Figure 2. The text of the comic strips in Spanish. Next to each one is its translation in English

Unfortunately, students' knowledge about breast and testicular self-exams was minimal because they had only four hours of class and expository activities on this topic. When we asked "What do you know about breast or testicular self-exams" after the pedagogical intervention, we found they did not know how to carry out these exams:

Alfredo: What is the testicular self-exam like?

Teacher: What do you think? What is the first thing do you think of?

Alfredo: Is it an injection?

Teacher: Do you know how do it?

Everybody: No

Jairo: You explained how do it last class

Juanita: the last class, but I forgot it. (Focus Group Answers, 2016)

Clearly, readings may not be the best strategy to promote the practice of these behaviors. Additionally, having only several hours devoted to this learning unit could prevent students from improving their knowledge on this topic.

Regarding the students' personal attitude towards the SBSRH, a favorable change occurred. The students said that it was positive to develop self-care practices of their sexual and reproductive health, as follows:

Juanita: it would be good to practice breast self-exams to dismiss the possibility of having a lump or something similar

Alfredo: to know if we have any disease like the ones we learned about in class

Enrique: to know if there is any disease that is not really developed so we can treat it on time

Alfredo: to be able to treat the situation. (Focus Group Answers, 2016)

Their favorable attitude toward breast self-exam may be due to the exposure and discussion of the case of Barbara (see her channel at <https://www.youtube.com/channel/UC3D9GgZZq-mrxddQhLwKjRQ/videos>). This stimulated emotions, reflection, and discussion of concrete and real situations, characteristics that according to Niño et al. (2012), should be included in teaching strategies for the formation of healthy sexual practices.

However, this attitude could be unfavorably affected by the belief that it is a strange practice, as I observed in a conversation at the end of a class:

Elizabeth asked me if breast cancer is produced even when people never have had sexual intercourse. I told her that it has nothing to do with that, and that is why it is important practice it every month. Sofia heard the conversation and said: “But I don’t know. What a strange exam. I would feel so strange.” I told her, “It is so simple; it is just touching yourself.” (Research journal, 11 June 2015)

It is important to reflect on why this student thinks a breast self-exam is strange. It is possible that cultural factors like the belief that it is bad to touch the body (religious belief) or it is embarrassing to do this examination could be a significant barrier to practice this self-care behavior (Akhtari-Zavare, Hannafiah, Zarina, Md Said, & Latiff, 2015; Tarawneh & Al-atiyyat, 2013). Consequently, it is essential to embrace strategies to minimize the effects of these beliefs and motivate students to practice breast self-examinations.

Regarding the personal attitude about postponing the early onset of penetrative sexual activity, we found students consider that at their age (from 12 to 16 years old) it is not convenient to have sex, specifically because of the risk of becoming pregnant. When I asked, “When do you think a person should start having sexual intercourse?” they responded:

Pedro: at 25 years old

Enrique: when people are able to, how do I say...

Juanita: to produce sperm

Jairo and Pedro: nooo!

Enrique: when people have the ability to take care a family, right?

Jairo: yeah! When we have a good job

Pedro: when we can fulfill all the obligations

Juanita: that parents have

Teacher: so, does sexual intercourse always result in pregnancy?

Jairo, Alfredo, Enrique: no

Pedro: if people don’t use contraceptive methods, yes. (Focus Group Answers, 2016)

However, the belief of it is not convenient to have sexual intercourse at the students’ age it is counteract by the perceived social norm. From the results of the questionnaires, it is evident that the majority of students believe that, for their classmates, it is good to have sex before 16 years old. These results can affect the favorable students’ personal attitude to postpone the early onset of penetrative sexual activity, since the perception of their friends’ beliefs (perceived social norm) combined with personal attitude are most influential factors determining the age of initiating sexual activity (Barrera et al., 2004). For this reason, it is fundamental to include approaches to counteract social influences of peers and a guide to respond to these pressures, as part of the course (Estrada, 2009). This is especially important

because it is known that “the first sexual intercourse of adolescents occurs through the indirect pressure of the group of friends and colleagues” (Vargas, 2007, p. 37).

Finally, regarding intentions to practice SBSRH and behaviors, we found conflicting results. Although students expressed an intention to go to the doctor even if they were not sick, the reality is that they almost never do. When we asked what changes they should make to have healthy sexuality, one student replied, "I must go to the doctor once a month; I must go to the doctor more often" (Student answer in a document developed during the pedagogical intervention, 2015). In contrast, students only go to the doctor when their illness cannot be treated with traditional medicines at home. When we asked why they thought their classmates only go to the doctor when they are sick, they answered:

Alfredo: Because most of our parents have traditional medicines at home, so they say we don't need to go to the doctor

Enrique: or they decide to go to the drugstore

Teacher: and why do your parents not take you to the doctor when you feel bad? What do you think?

Pedro: Maybe they trust traditional medicines like herb infusions more.

Juanita: Parents trust home medicines more than conventional ones.

Teacher: For example, when do you go to the doctor?

Juanita: I went two months ago.

Teacher: Why do you go?

Juanita: Because I had zika symptoms

Teacher: ohhh

Alfredo: Me too. My parents took me to the doctor in a wheelchair (...)

Enrique: I almost never go to the doctor. It is so uncommon if I go. (Focus Group Answers, 2016)

Because the students are minors and must go to the doctor with their parents, it is necessary to link the parental figures to the pedagogical intervention to encourage this self-care behavior in their children.

Respect to intention of practice breast or testicle self-exams, more than half of the students expressed they wanted do it (results of the intervention evaluation questionnaire), but most did not carry out this practice, neither during or after the course:

Teacher: Have you ever done a self-exam?

Everybody: Noooo

Teacher: Did you practice it while you were in the course? Did you feel curious to try it?

Everybody: Nooo (nervous laughter). (Focus Group Answers, 2016)

Results show favorable students' change on their knowledge, personal attitude and intentions to practice SBSRH, but it is not evident a positive change on their behaviors. It is necessary to develop different active and interactive learning activities that indicate the adequate and easiest routes to perform SRSRH, like how to carry out breast or testicle self-exams. Effective knowledge on these exams promotes self-efficacy, in other words they would feel competent to practice them and consequently, they would practice them.

Conclusions

To improve my teaching practices with the support of ICT, it was essential not only to incorporate them in an effective way for learning but also to reflect on my teaching while considering theoretical recommendations and educational needs of my students. This approach to praxis was meant to transform my teaching practice and support the achievement of the educational goal. Before carrying out this research, my teaching practices with SBSRH were not coherent with research-based recommendations. I omitted content that was not closely related to biology, and I only implemented the identification of beliefs that adolescents had about sexual intercourse. I also found that my preconceptions could have promoted early onset of penetrative sexual activity.

From the implementation of the Self-care in Action course, a favorable change was generated in my students. Their knowledge improved relative to the number of class hours dedicated to each concept and the number and diversity of learning activities supported by ICT. With respect to their personal attitudes, students believed it is advisable refrain from sex at their age and to perform breast or testicular self-exams. They also consider that not carrying out self-care practices could have negative consequences for their lives. These changes may be due to the exposure of real cases that stimulated emotions, reflection, and discussion about the consequences of not practicing such behaviors.

Focusing on intentions to practice SBSRH and behaviors, we found contradictory results. Although students stated that they wanted to go to the doctor even if they were not sick and that they wanted to perform breast or testicular self-exams, they did not practice these behaviors. This could be related to parents' beliefs in using traditional medicines to treat illnesses, the unsuccessful way that breast and testicular self-exams were presented, and barriers such as believing it is strange or embarrassing to touch our body.

In a broader perspective, we conclude the process to encourage SBSRH is complex and, according to our interpretation, it takes place in stages: acquisition of knowledge, changes in the predictors of behaviors (like personal attitude, perceived social norms, and expectation of negative effects), changes in intentions to practice SBSRH and changes in behaviors. In this sense, it is fundamental to investigate the elements that are required to move from intentions to the execution of behaviors and incorporate them in the pedagogical intervention.

Finally, I grew both personally and professionally. First, I was able to challenge my assumption that truth and validity come exclusively through quantitative research. I now believe that qualitative research is essential because it gives meaning and reveals perceptions of who is part of the problem. Because of action research, I realized that I could intervene in order to change an educational situation in which I am a participant, fostering a self-reflective process that led me to question why a teaching strategy was not working in order to improve it. Furthermore, I now understand that as a teacher, my assumptions affect my students; therefore, now I am more careful with my assumptions and what I say in my classes. For this reason, I now identify the students' needs before planning an intervention.

What Is Next?

Because action research is perceived as a development spiral, where the research and reflective process is continuous, we believe that several aspects should be modified for a forthcoming implementation of the Self-Care in Action course. First, it is necessary to include at least three learning activities with ICT support (expository, active, and interactive) for each concept addressed. Secondly, spaces must be created where students can question the assumptions of their friends, peers, and mass media, thus confronting the effect of the perceived social norm. Third, it is important to integrate students' parents as participants in the course

since their perceptions exert an influence on the behaviors of their children. Finally, linking health professionals to demonstrate the best way to carry out self-care behaviors could be a positive influence for students.

Regarding future research, the following questions are important to answer: How can we include parents in such a way that they promote SBSRH in their children? How can we encourage students to work collaboratively, with ICT support, for the formation of healthy sexual behaviors? How do the teacher's previous conceptions affect their teaching practices in relation to sex education, and how do they affect students' decisions to initiate penetrative sexual activity? How do adolescents' conceptions of their bodies (from their sociocultural context) affect their willingness to adopt SBSRH?

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We would like to thank the Proyecto Formación de Talento Humano de Alto Nivel-Regional Tolima and the Universidad de los Andes, which helped to develop this study. We would also like to say thanks to Elvia Vargas for her advices on how to teach sex education at school.

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Article Citation

Rojas Briñez, D. K., Galvis Panqueva, Á. H., & Flores Hinojos, I. A. (2019). How should I teach sex education in middle school? An action research study on an ICT-based intervention. *The Qualitative Report*, 24(2), 405-428. Retrieved from <https://nsuworks.nova.edu/tqr/vol24/iss2/16>
