Outcomes of a systematically designed strategy for the implementation of sex education in Dutch secondary schools

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Abstract

This study examines the effects of a systematically designed innovation strategy on teachers’ implementation of a sex education curriculum and its related determinants. A quasi-experimental group design was used to assess the effectiveness of the innovation strategy. Teachers filled in questionnaires on the determinants of curriculum implementation and kept a record of their actual use of the curriculum. We measured several determinants, including teachers’ curriculum-related beliefs, characteristics of the interactive context and characteristics of the innovation strategy. Participating teachers (n = 109) carried out most of the activities they were supposed to (81%). Multiple linear regression indicated that their outcome beliefs and perceived instrumentality of the curriculum best predicted extent of use of the curriculum (R² = 0.23). The innovation strategy had a positive impact not only on extent of use (18.4 activities versus 15.8 activities; t = 2.3, P < 0.05), but also on teachers’ curriculum-related beliefs. It can be concluded that a systematically designed innovation strategy has the potential to produce significant changes in classroom-based sex-education practices. Not only did teachers exposed to the innovation strategy implement more of the curriculum than teachers in the control group, also teachers’ beliefs and expectations about student learning constituting their classroom behavior changed accordingly.

Introduction

In The Netherlands, visits to STD outpatient clinics have increased in recent years, as has the prevalence of STD, especially gonorrhea and chlamydia (Vogels et al., 2002). A yearly increase of 20% of STD and HIV infections since 2000 is seen in young people in the 15–19 age groups. In addition, the incidence of unplanned pregnancies among teenagers from certain ethnic groups (Antillean, Ghanaian and Surinam) has risen (Stuart et al., 2002).

To prevent young people from having unsafe sex, it is important to teach them skills related to safe sex (Rotheram-Borus, 1995; Jemmott, 2000; Kirby, 2002). Schools provide an ideal setting for this, as most children can be reached there. However, teachers offering sex education often use more passive forms of learning and tend to disregard skill-oriented learning activities (Schaalma et al., 1993; Van den Akker and Kuiper, 1993; Paulussen, 1994). A reason for not using skill-oriented activities might be that teachers find it very difficult, for example, to handle hilarity and disruption caused by role-play (Wight, 2000). However, if such essential learning activities are ignored when a programme is implemented, its potential effectiveness may not be achieved.
In this study, the innovation strategy that was designed to improve teachers’ classroom implementation of a sex-education curriculum was evaluated. This curriculum, a revised version of *Long Live Love*, which was developed 10 years ago, had produced desirable student learning outcomes, when correctly applied (Schaalma, 1996).

The present study focuses on the determinants of teachers’ implementation of the revised *Long Live Love* curriculum, and on the effects of the applied innovation strategy on their classroom implementation and on related determinants.

**The ‘Long Live Love’ curriculum**

*Long Live Love* is developed for lower secondary education (age 13–15). It comprises a teacher’s manual, student magazine and video. Its main objective is to develop skills, particularly in communication and negotiation, that will enable students to transfer their generally positive intentions with regard to safe sex in practice. The skill-directed activities are structured on video, which has been shown to require less effort of teachers than role-play, and which also provides opportunities to introduce relevant processes of social influences and role models (i.e. peers) demonstrating critical skills in risk-bearing situations (Schaalma et al., 1993).

When compared to the original curriculum, the revised version remained unchanged concerning the theoretical foundation. *Long Live Love* was developed according to the model for planned health education (Schaalma, 1994). First, psychosocial determinants of safe sex were systematically assessed. Next, the outcomes were translated into educational aims based on McGuire’s Persuasion–Communication Matrix (McGuire, 1985). Finally, these aims were translated into practical teaching methods and materials. The original version was adapted to better reflect current youth culture, and to take more specific account of gender and ethnically related differences. The new curriculum consists of 30 learning activities divided over six lessons. Nineteen activities were indicated as the core curriculum; the remaining activities provided teachers with alternatives that might be more appropriate for their students.

**The innovation strategy**

Research on curriculum innovations stresses the inadequacy of thinking about mutually exclusive strategies, either being top-down or bottom-up (Fullan, 1991; Cousins and Leithwood, 1993). However, top-down approaches fall short because they tend to neutralize or bypass the development of user capacities and congruent belief structures, whereas bottom-up projects tend to ignore teachers’ need for procedural clarity and practicality. When combining the merits of top-down and bottom-up approaches into a more comprehensive strategy, the following features should be accounted for (Crandall, 1989; Paulussen, 1994):

- The development of validated materials that provide clearly specified procedural referents for teachers’ decision making.
- Access to alternative adoption practices that promote informed, local choices.
- A combination of pre-implementation training and follow-up assistance during implementation, so as to improve teacher learning.
- Peer-participation, especially after the pre-implementation stages.
- Active support and leadership at the regional level and school level.

In this study, regional health professionals applied a two-stage school-directed innovation strategy: the adoption strategy and the implementation strategy. The national project team facilitated the task of the regional health professionals by means of training and follow-up support, and by the provision of scripts (e.g. model recruitment letter, training protocol) on how to prepare, implement and evaluate the innovation strategy.

Within the framework of the adoption strategy, regional health educators sent individual teachers information about *Long Live Love* consisting of a model recruitment letter developed by the national team, a brochure containing practical information on the replacement of the most frequently used textbooks by the *Long Live Love* curriculum and a so-called ‘adoption brochure’ based on the principles of vicarious learning (Bandura, 1986). In addition to information on the structure and content
of the curriculum, this brochure presented the testimonies of various teachers (symbolic models) on the practicability of the proposed classroom activities and on the positive reactions they had noted when their students were applying them (students’ enthusiasm and active classroom participation). After a follow-up telephone call, the regional health professionals visited all teachers who had shown interest in further discussions on the content of the curriculum, on alternative ways of applying it, and on the support that could be offered to them before and during classroom implementation. If teachers expressed a positive intention to use the curriculum, an agreement was signed on a plan for its implementation and support.

Next, each regional team developed its own plan for the implementation strategy, providing details on pre-implementation training and follow-up guidance for teachers. Training had two main objectives: to provide procedural clarity about the application of the curriculum and about the proposed interactive learning activities in order to reinforce teachers’ self-efficacy beliefs.

Guidelines for the design of the training were derived from Social Cognitive Theory and research on staff development, which indicated that training should comprise demonstration of good practices (modeling), guided enactment, feedback and coaching during self-directed application (Bandura, 1986; Joyce et al., 1988). The training consisted of two meetings, each of 2.5 hours. Topics included insight into students’ beliefs about sexuality, handling differences between minority cultures and the sexes, and condom demonstration.

### Research framework

The general outline of the research framework was derived from the Theory of Planned Behavior (Ajzen, 1991), Social Cognitive Theory (Bandura, 1986) and from previous research on innovation in AIDS education in Dutch schools (Paulussen et al., 1994, 1995). Within this framework, teaching is conceived as an intentional act that is determined mainly by teachers’ personal beliefs and thoughts.

The determinants of use were further detailed by the outcomes of interviews with individual teachers about the new curriculum. Three clusters of curriculum-related beliefs—attitudinal, normative and self-efficacy beliefs—were assumed to affect curriculum use most directly (see Figure 1). These beliefs, in turn, may be influenced by characteristics of the interactive context (e.g. the school’s overall policy on providing sex education) and/or by characteristics of the innovation strategy (e.g. attendance of the pre-implementation training course).

### Curriculum-related beliefs

Empirical research has indicated that teachers’ classroom implementation is best explained by their attitudinal, normative and self-efficacy beliefs on that particular innovation (Doyle et al., 1977; Burak, 1994; Paulussen et al., 1994; Fang, 1996; Sarama et al., 1998). While curriculum-related attitudes can originate in teachers’ perceptions about the importance and feasibility of the proposed student learning outcomes (‘outcome beliefs’), teachers may also believe that they themselves will benefit from using the curriculum (‘teacher benefits’). Curriculum utilization may also be facilitated by teachers’ beliefs about the ‘instrumentality’ of the innovation, such as the clarity of procedural referents (Doyle et al., 1977; Clark et al., 1986).

In addition, social referents (e.g. colleagues, students) may provide standards for teachers’ innovation decision-making (Orpinas et al., 1996; Ros et al., 1996; Howe et al., 1998; Sarama et al., 1998). Subjective norms account for normative beliefs and for the motivation to comply with these referents, whereas social support involves the affective and/or instrumental support expected of social referents in the teachers’ task environment.

Self-efficacy is often found to be a strong predictor of curriculum innovations, in general, and of innovations in sex education, in particular (Burak, 1994; Paulussen, 1994). It involves teachers’ perceived control over the teaching and management strategies that are required for the innovation.
Characteristics of the interactive context
Since teachers have to teach in collaboration with their colleagues and within the boundaries set by the policy of their school, curriculum implementation is assumed to be facilitated by a clearly stated school policy and by teachers working in teams that provide opportunities for colleague interaction about the innovation (Paulussen et al., 1994; Ros et al., 1996; Howe et al., 1998). Innovation processes within a school may also be facilitated by access to support provided by external organizations (Basch, 1984; Rogers, 1995).

Characteristics of the innovation strategy
To determine whether the 15 participating regional health educators executed the innovation strategy as proposed by the national project team, three interviews were held with each of them. The results, reported elsewhere, showed that the adoption and the implementation strategies were both carried out, with only minor deviations from what was intended (Wiefferink, 2002).

Method

Design
A quasi-experimental group design was used to assess the effectiveness of the applied innovation strategy. First, the national project team recruited regional health service organizations to participate in the project. All these services (about 40) were approached, of which 15 were willing to participate. The services were asked to recruit teachers from four different schools. All these teachers were exposed to the innovation strategy and were assigned to the intervention group. Teachers in the control group were recruited from other regions by the national project team. Data on the determinants of teachers’ curriculum implementation were gathered by questionnaires, while actual use of the curriculum was recorded by self-administered logs. Teachers in the intervention group completed the questionnaire twice: 2 weeks before they received the initial training and immediately after this training, just before they started to use Long Live Love. Teachers in the control group completed the
questionnaire only once, just before they started to use the new curriculum. Teachers in both groups recorded the actual use of learning activities in logs. In addition, after completing the curriculum in their classes, 15 teachers in the experimental group were individually interviewed about their experiences. In total, 180 teachers from 84 schools participated in the intervention group; 34 teachers from 22 schools in the control group.

**Self-administered log**

**Extent of use of Long Live Love**

After each lesson, teachers rated each curriculum activity ‘0’ if they had not implemented it, ‘1’ if they had implemented it, but had deviated from what was prescribed, and ‘2’ if they had implemented it as prescribed in the manual. The index for extent of use was calculated by adding up the scores of all activities and dividing by the number of activities (range 0–2; Cronbach’s $\alpha = 0.88$). The higher the score, the higher the number of activities that were implemented as prescribed.

**Questionnaire**

**Teachers’ curriculum-related beliefs**

To enhance internal validity of the study, the curriculum *Long Live Love* was the guiding principle for developing the questionnaire items. Outcome beliefs were measured as a weighted result of the teachers’ perceived feasibility and importance of the student learning outcomes specified by the curriculum. Nineteen five-point scaled items ($\alpha = 0.91$) were used, such as ‘How important is it to you to teach students how to use condoms?’. Teacher benefits were indexed in nine six-point scaled items, such as ‘I expect using this curriculum to increase my knowledge of STDs’ ($\alpha = 0.93$). Instrumentality was assessed by 16 six-point scaled items, such as ‘The time necessary for preparing classroom instruction is acceptable’ ($\alpha = 0.89$).

Regarding subjective norms, teachers responded to the normative beliefs of students, their principal, colleagues, external consultants, parents and members of the school board. Normative beliefs were weighted by teachers’ motivation to comply with these referents ($\alpha = 0.81$). Social support was assessed by asking teachers if they expected support from them if problems may arise when using the curriculum ($\alpha = 0.81$). Self-efficacy was assessed by 19 five-point scaled items, covering skill-related domains such as the use of interactive teaching strategies, talking frankly about sexuality, and using management strategies to create a minimum level of classroom orderliness and safety ($\alpha = 0.90$).

**Characteristics of the interactive context**

School policy was assessed by four six-point scaled items, such as: ‘At our school we regularly discuss the aims of our sex education’ ($\alpha = 0.75$). Interaction between colleagues was assessed on the basis of two dimensions: interaction with school management and interaction with fellow teachers. Both were measured by three six-point scaled items, such as: ‘The school management hardly talks about the positive aspects of sex education’ or ‘I always discuss plans for using new educational material with colleagues in my department’. Internal consistency varied from $\alpha = 0.68$ (school management) to $\alpha = 0.90$ (colleagues). Regarding the school’s network, teachers evaluated their satisfaction with the innovation support they had received in the past from the national and regional educational support centers.

**Background characteristics**

Teachers reported their gender, age, years of teaching experience, years of experience in teaching sex education, their teaching subject and whether they had taken other kinds of refresher courses on sex education during the past 5 years.

**Statistical analysis**

We assessed the relationships between extent of use of *Long Live Love* and its antecedents by means of Pearson correlation’s and stepwise multiple regression analyses. Because only one or two teachers per school participated in the study, it was not necessary to perform regression analyses with multilevel techniques. Only factors that significantly correlated with extent of use ($P < 0.05$) were used for the
regression analyses. The t-tests were used to explore the differences that appeared to exist between the intervention and control group, as well as the effects of the pre-implementation teacher training in the intervention group.

Sample description

In sum, 109 teachers from 77 schools of lower secondary education completed all questionnaires and teacher logs: 89 teachers from the intervention group (49%) and 20 teachers from the control group (59%). The participating schools were well spread over The Netherlands, with big-city schools participating as well as schools in rural areas. Over three-quarters of the participating teachers were female (76%). The mean age was 43 years (SD = 8.5). Years of teaching experience varied from 1 to 35 (mean = 16; SD = 9.3), while years of experience teaching sex education varied from 0 to 30 (mean = 9; SD = 7.9). About 93% were teachers of Biology and/or Care (a subject combining home economics and health education). The majority of the participating teachers (72%) had never taken a refresher course in sex education.

Extent of use of Long Live Love

On average, teachers carried out 81% of the 19 learning activities they were supposed to implement. Most activities were carried out by over 80% of the teachers, except the activities of the final two lessons (varying between 37 and 83%) and the alternatives that were provided to them (varying between 6 and 51%). Most teachers stated lack of time as the main reason for omitting these final activities. There appears to be no systematic variation in the extent to which active and passive forms of learning were implemented by the teachers.

Determinants of curriculum implementation

Table I shows the mean scores of the determinants and their correlation with extent of curriculum use and the results of the regression analyses. Most significant correlations were found among teachers’ curriculum-related beliefs. The only other significant factor was the presence of a school policy on sex education. The regression analyses indicated that teachers’ outcome beliefs and perceived instrumentality best predicted extent of use, explaining 23% of variance in extent of use. In order to explore these contrasting belief structures in more detail, teachers were divided into two groups. The median score on extent of use (1.17) was chosen as the cut-off point for comparing low users versus high users.

Teachers’ outcome beliefs

On average, teachers had fairly positive perceptions of the feasibility and importance of the intended student-learning outcomes (Table II). They were especially positive about the cognitively oriented outcomes, such as ‘making a correct distinction.
between safe and unsafe ways of making love’, ‘knowing where condoms and contraceptives can be bought’ and ‘adequately estimating the risk of infection with STD’. After weighting perceived feasibility with perceived importance, the same learning outcomes significantly discriminated low users from high. These outcomes were generally perceived as more important by teachers who scored relatively high on extent of use.

**Perceived instrumentality**

In general, teachers appeared to be positive about the instrumentality of *Long Live Love* (Table III). Compared to high users, low users judged the curriculum’s instrumentality to be significantly more negative on six items. Three of these items referred to the suitability of the curriculum for students with varying sexual experiences, lifestyles and sexual maturation. This may also have been a reason why low users agreed more with the statement that the curriculum too openly confronted students with sexuality. Similarly, high users were generally more positive about the feasibility of the curriculum’s objectives and about the practicality of the guidelines for preparing the lessons.

**Effectiveness of the innovation strategy**

Comparison tests indicated a positive, although not significant, training effect between teachers who were approached to attend the training course (intervention group) and those who did not (control group) (18.2 versus 16.1; $t = 1.7$, $P = 0.09$). However, we did find a significant effect when teachers in the intervention group who did not attend the training ($n = 4$) were excluded from the analysis (18.4 versus 15.8; $t = 2.3$, $P < 0.05$).
Table IV indicates that the training of teachers in the intervention group also had a significant positive impact on their curriculum-related beliefs, especially on their outcome beliefs, subjective norms, perceived social support and self-efficacy. This is accentuated by the fact that, before training, the mean scores on all curriculum-related beliefs in the intervention group did not differ from those of the control group. Examination of these changes before and after training showed that nine out of 19 outcome beliefs had improved significantly. The impact on teachers’ subjective norms resulted largely from positive changes in their normative beliefs about their principal, colleagues and students. After training, teachers also expected more support and a greater social reward for using the curriculum. Even more important, after the training teachers’ beliefs about their own mastery of using Long Live Love had improved. For example, teachers felt more confident about their classroom management, such as controlling disruptive classroom behavior, and they felt more comfortable about directing lessons in which students practice the use of condoms on an artificial penis.

### Discussion

This study indicated that a tailored innovation strategy can improve teachers’ classroom implementation of a sex education curriculum. A positive and somewhat surprising result of this study was teachers’ relatively high compliance with the intended curriculum activities. Nearly all activities were carried out by at least 80% of the teachers, in most cases as prescribed by the curriculum developers. Other research on curriculum innovations often reported a maximum compliance rate of 50% (Van den Akker and Kuiper, 1993; Paulussen, 1994). Unlike participants in earlier research on the implementation of AIDS education curricula in Dutch secondary schools (Paulussen, 1994), teachers in this study appeared to be much more willing and able to use interactive student-centered strategies.
rather than more teacher-centered ones. These results lead us to conclude tentatively that a systematically designed innovation strategy has the potential to produce significant changes in classroom-based sex-education practices. Teachers exposed to the innovation strategy not only implemented more of the curriculum than teachers in the control group, but also their beliefs and expectations about student learning constituting their classroom behavior changed accordingly.

The study had some limitations. First, teachers were not randomly assigned to the intervention or control condition, which might have lead to different entry levels. However, we found no differences on the outcome criteria between teachers in both groups at the onset of the study. Second, voluntarily participation might be a source of bias, as the only participants were those who were motivated to use Long Live Love. It is also possible that participating teachers come from schools with good policy concerning sex education compared to schools that did not participate. This might explain the relatively high extent of curriculum use compared to earlier studies (Van den Akker and Kuiper, 1993; Paulussen, 1994). However, it is expected that this bias may have only affected the reported means, and not the association between extent of use and related determinants. A third bias might be the low response rate, but this is unlikely, because non-response analysis showed no differences in curriculum-related beliefs between teachers who filled in all questionnaires and teachers who only filled in the first questionnaire. Finally, the fact that our study mainly focused on individual teachers might have lead to an overestimation of the influence of the teacher compared to factors on school level on the use of a sex education curriculum. It may be possible that such factors are associated with extent of use. However, we assume that, as far as these associations exist, the impact of school-level processes will be moderated by teachers’ curriculum-related beliefs and are thus indirectly accounted for.

Although the study design does not allow us to judge the relative importance of specific effect conditions, we tentatively conclude that the reported teacher level outcomes result from a combination of three critical characteristics of the applied innovation strategy: (1) the opportunities for vicarious learning provided by the adoption and implementation strategies, (2) teachers’ access to alternative practices, and (3) the perspective that teachers’ colleagues and regional health educators would provide ongoing personal assistance.

A well-structured curriculum also appears to be a prerequisite for successful implementation. Teachers in this study indicated that the curriculum materials provided clearly specified procedural guidelines for their educational planning. The materials included a teacher manual, which suggested alternative responses to some of the negative reactions students might have during classroom discussion of some of the more sensitive issues. In their responses to the questionnaire and post-implementation interviews, teachers also showed that they greatly appreciated the alternative learning activities suggested for situations in which the core activities seemed unsuitable for particular classes.

The results showed that curriculum-related beliefs contributed more to the extent of use of Long Live Love than the interactive context or innovation strategy. Extent of use was most strongly predicted by teachers’ outcome beliefs and the perceived instrumentality of the curriculum. This runs counter to the findings of other studies, in which self-efficacy appeared to be a dominant predictor of teachers’ decision making on innovation. One possible explanation might lie in the mutual correlations between outcome beliefs and instrumentality, on the one hand, and self-efficacy, on the other hand. This would correspond with the theory of Bandura that self-efficacy predicts outcome beliefs and other cognitions, and that these factors in turn predict behavior (Bandura, 1998). Another explanation might be that teachers’ efficacy is less dominant during the stage of implementation than during the preceding stage of adoption, while the opposite applies to teachers’ estimated feasibility and importance of student learning outcomes. As is known from research conducted within the framework of the Concerns Based Adoption Model, teachers’ concerns throughout the early innovation stages are personal and focused on short-term procedural
content, while teachers’ concerns about meeting students’ learning outcomes will become prevalent only after a minimum level of routine in-classroom practices has been obtained (Hall et al., 1978, 1987). Most teachers in our study had some earlier experience with sex education (92%). This may explain why their estimates of the feasibility and importance of the prescribed student learning outcomes became a much stronger predictor in the present study than in teachers’ adoption of sex education curricula (Paulussen et al., 1994).

This study showed that the applied innovation strategy had a positive effect on the stage of initial implementation of the curriculum. In order to enhance continuation, the curriculum should be part of a broader program to promote health in students, such as suggested by the WHO’s Health Promoting School concept. This includes additional involvement of the family and the wider community, and a formally articulated school policy and school ethos concerning sex education.

References


Implementation of a sex education curriculum in schools


Received on March 4, 2004; accepted on August 12, 2004