INFORMATION TECHNOLOGY-MEDIATED ISSUES IN SEXUAL HEALTH AND HIV/AIDS EDUCATION

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ABSTRACT

Literature on the usefulness of IT-assisted HIV/AIDS interventions especially in the African setting is scarce. This leaves little to nothing known about the benefits of IT-assisted HIV interventions from the experience of Africa moreover where the HIV pandemic is widespread. This qualitative research explores in-depth the IT-mediated issues that influence the adoption of an IT-assisted sexual health and HIV/AIDS education intervention implemented in Uganda. It involves interviews with 33 participants including 30 intervention students, 02 intervention teachers and 01 head of the investigated school. Results indicate that such interventions can be sources of the otherwise denied sexuality information, are accessed irrespective of geographical boundaries, are sources of coping strategies for overcoming HIV risk behaviour, provide opportunities for tailoring the interventions to the varying needs of young people, are more interactive and engaging, and boosts teachers' confidence in delivering intervention contents that they would otherwise feel embarrassed to deliver. Such benefits can provide vital benchmarks for designing, developing, implementing and evaluating IT-assisted sexuality and HIV/AIDS intervention.

Key Words: IT-assisted sexuality and HIV/AIDS interventions, sexual health education, IT-mediated issues, youth health on the internet, online HIV health education.

1. INTRODUCTION

This study investigates in-depth the IT-mediated issues that influence the adoption of an IT-assisted sexuality and HIV/AIDS education. Traditional methods of delivering sexual education have persistently been reported to be constrained by educators' and learners' lack of confidence in face-to-face discussions, mainly due to the sensitive nature of sexual issues (Shepherd 2011). Also, youths are normally denied sexual health and HIV/AIDS information due to misconceptions that access to such information may sexually spoil them (Power 2004). Such denial results into youths' lack of knowledge of sexual health issues and HIV/AIDS prevention.

Despite the previous recorded success stories of HIV/AIDS prevention in Uganda, the prevalence particularly among the youths aged 15 to 24 started increasing again since mid-2000 (Ministry of Health Uganda 2005). Since HIV/AIDS is mainly a behavioural disease that is commonly transmitted through risky sexual practices, IT can provide innovative ways of preventing its transmission (Benotsch et al., 2006; Noar et al., 2009). This is particularly true among the youths who are normally fond of embracing IT. By using IT, the challenges of confidentiality, stigma and discrimination associated with face-to-face sexuality and HIV/AIDS education can be addressed (Kalichman et al., 2002; Levine et al., 2008). This is due to the potential of IT to anonymously convey the otherwise taboo messages of sexuality and HIV prevention. However, the application of IT-assisted sexuality and HIV/AIDS

interventions is significantly limited and under-researched, particularly in developing countries moreover where the pandemic is widespread.

Reasons for this limited application include lack of computers, network unreliability, low internet accessibility, and low levels of computer literacy (Wootton et al., 2011; Zolfo et al., 2006).

Consequently, little is known about the usefulness of such intervention and the factors that influence their adoption. It is this identified gap that this research aimed to address. The research question that this investigation aimed to answer was: What are the IT-mediated issues that influence the adoption of an IT-assisted sexuality and HIV/AIDS intervention?

2. METHODOLOGY

2.1 The World Starts With Me (WSWM) Intervention

The WSWM is a school-based IT-assisted World Population Foundation (WPF)-sponsored sexual and reproductive health and rights intervention, developed by Butterfly Works, SchoolNet Uganda and local experts in Uganda. The overall objective of the intervention is to improve sexual and reproductive health and rights of young vulnerable populations and to prevent HIV/AIDS. First implemented in Uganda in 2003, the intervention has also been adapted to the local context and implemented in Kenya, India, Thailand, Indonesia, and Vietnam. Since 2003, the intervention has been implemented in over 200 secondary schools in Uganda in collaboration with the ministry of education. The 14 lessons of the interventions are available on the World Wide Web (http://www.theworldstarts.org), on CD-ROM and in printed form. In 2008, over 8,000 young people in Uganda had accessed the web-based version of the WSWM intervention while 2000 young people had accessed the hard copy version of the curriculum.

The intervention also incorporates an online counselling and support centre (http://schoolnetuganda.sc.ug/wswmonlinesupport/) that enables the exchange of sexual health and HIV/AIDS-related information between sexual reproductive health counsellors and young people.

After attending a 5-day training workshop, intervention teachers take students through the intervention in their respective schools for 7 to 10 months, depending on the amount of time available for the intervention. In the school that this study investigated, the intervention was delivered using a combination of intervention handouts, CDs and the Internet. Delivering the 14 lessons includes the use of virtual peer educators, interactive safer sex quizzes, story boards, and role plays. Specifically, the 14 lessons of the intervention are: (1) The World Starts With Me; (2) Emotional Ups and Downs; (3) Is Your Body Changing Too?; (4) Friends and Relationships; (5) Boys and Girls, Men and Women; (6) Fight for your Rights!; (7) Sexuality and Love; (8) Pregnancy: 4 Girls and 4 Boys!; (9) Protect Yourself: STIs and HIV/AIDS; (10) HIV/AIDS: U have a role 2 play 2 ; (11) Love shouldn't Hurt; (12) Your Future, Dreams and Plans; (13) My Top Tips peer book; (14) Exhibition.

2.2 Selection of Participants and Data Collection Techniques

This research is part of the PhD study that was pursued in Manchester Business School, the University of Manchester-United Kingdom. This study was approved by the Research Ethics Committee of Manchester Business School. Participants were informed that their participation is voluntary and that their responses would be published. Confidentiality of respondents was ensured by not including their names on interview transcripts and keeping their recorded interviews securely.

A retroductive approach where the initial set of themes generated from existing theories/literature is used to guide the research process. Literature (e.g. Kalichman et al., 2002; Rhodes, 2004; Lustria et al., 2009; Coulson and Knibb, 2007) specific to the use of IT-assisted interventions for health guided the formulation of interview questions and the phrasing of themes during data analysis.

In 2008, the research sought and was granted consent to investigate the WSWM intervention by the Director of the intervention. Although there were many schools that had implemented the intervention, the school selected for this study was of particular interest for several reasons: one; perceived high student vulnerability to HIV/AIDS since it is located in a military barracks with many war-orphaned students and children from soldiers' separated families. Two; the researcher had made initial contacts with the intervention teachers of this school during one of the intervention workshops. Three; this school was within the proximity of the researcher's residence and was therefore economically viable. The 33 participants involved in this research were selected on the basis of their relationships with the intervention; they were:

- Two trained intervention teachers who help students go through the intervention, of which 01 was a female and the other a male aged between 35 and 40.
- Thirty students that had just completed the intervention, of which 17 were females, and 13 were males aged between 11 and 16.
- The male head of the investigated school aged 45 who had completed the 'Head Teachers Orientation' about the intervention.

Such purposive sampling is the commonly used sampling technique in qualitative research (Kaplan, 2001). The selected students and teachers were all exposed to both the non-IT-assisted (printed handout) and the IT-assisted (web-based) version of the intervention.

Face-to-face semi-structured interviews were used for data collection due to their advantage of allowing collection of in-depth data from participants' natural settings (Yin, 2009). The researcher asked questions that aimed at identifying the IT-related benefits of using the intervention.

These questions included:

- What IT-related benefits motivated you to adopt the WSWM intervention?
- What IT-related constraints did you experience in using the WSWM?
- How do delivering/accessing WSWM using IT compares with its delivery without IT (in terms of level of engagement, confidence, accessibility, social interactions etc)?
- What is your experience of using the WSWM?

Interview appointments were made, after which the teachers and the Head of School were interviewed in their offices during normal school hours from September to December 2008. Students were interviewed (Dec.2008) over the weekends in a free classroom that was made available to the researcher by the teachers. Although a relatively long period of time has passed since data collection, findings are still relevant since the assessed attributes are not dynamic. Emphasis was put on questions that aimed at understanding stakeholder experiences of using the intervention. All interviews were digitally recorded with consent from participants. Each interview lasted from 30-60 minutes. Interviews were ttranscribed and thematically analyzed based the research questions. Although all the transcripts were

analysed for new/confirming themes, no new themes/codes emerged after analysing 23 transcripts; the remaining 10 themes supported the previously identified themes. This implied some sufficient level of saturation (Miller and Crabtree 1994).

3. RESULTS

3.1 Reliability of Information

The school embraced the intervention in order to help save vulnerable students from otherwise being misled by the increased exposure of unreliable information from the internet, televisions, newspapers, friends, peers and other sources of information. As one teacher remarked:

> *You see even if we don't give them this program, young people these days are exposed to wrong information on the internet, TVs, newspapers, friends etc. So they need WSWM in order to get the right information and avoid the dilemmas of catching AIDS and getting early pregnancies.*

However, being an internet-based intervention, there were concerns of student's exposure to 'too much information' that could sexually spoil them. One head of school commented:

> *You see such programs especially because of the internet may pump our children with too much information and make them impossible to control sexually.*

3.2 Social Support and Coping Strategies

The intervention's online support centre was young people's source of social support and coping strategies from both expert counsellors and peers. This included peer-based learning and sharing of experiences and coping strategies from young people who have overcome HIV risky situations and behaviours. As one student remarked:

> *I remember at some point, I had an issue I was worried about but when I went to the program and read through the messages posted there, I realised that some other youths were going through the same problem and this kind of comforted me because I knew I was not alone. Although the counsellor's response sort of answered my question, it was when I read a testimony from a fellow youth who was sharing how he overcome the same problem that confirmed to me that I can also get out of it.*

3.3 Level of Engagement

The use of virtual peer educators actively involved students in role modelling e.g. during the interactive safer sex quizzes and games as narrated by one of the students:

> *It was really hands on, because we would first watch the computer Rose and Davis talk together about issues like negotiating condom use and refusing unwanted sexual relationships. Then, after we would play with the computer, in order to practically play the games about using a condom and refusing unwanted sexual relationships. As in after practicing it from the computer, it's like I have done it, so it was not hard when I had to do it in real sense.*

3.4 Level of Confidence

Students who would otherwise feel uncomfortable to voice out their sexual health issues in class before their fellow students and teachers resorted using the intervention's online support centre for issues that seemed too sensitive to them.

One student noted:

> *I was shocked by private words talked in class... it is not easy for me to ask in class …sometimes, I would want to ask about something but then I would think that oh what will the teacher think about me, or I kind of think that students will laugh at me, or sometimes it is something you would not want anyone to know that you are like that, but if I type my question on the internet, I know that no one will know that I am the one asking that question.*

The intervention's use of virtual educators and videos also boosted teachers' levels of confidence by demonstrating issues that would otherwise be too sensitive for them to discuss with students: Teachers reported:

> *Yeah, I know the basics of computer and I can run through the program. But it is challenging to teach some of the things that are too sensitive.*

> *I don't feel OK to talk about then with students but what gives me sort of courage is that we use videos and the computer-based peer educators to illustrate such sort of things.*

3.5 Accessibility

Findings indicate that the intervention's website and online support centre provided unlimited accessibility to sexuality and HIV/AIDS prevention information irrespective of the geographical boundaries and temporal barriers: One student narrated:

> *At school because we did not have enough computers but because I am a day-scholar, when I go could home in the evenings and my aunt is not using her computer, I could then open the WSWM program using her computer and go through the program.*

Due to its IT-assisted nature, the intervention was perceived as a source of the otherwise denied sexuality and HIV/AIDS-related information: One student remarked:

> *You know like some of the things the teacher could not explain to us like for example using condoms. I remember our teacher simply told us that as young people, we need to abstain from sex rather than rushing to use condoms. And generally he did not explain much about using condoms but when I went to the online support centre, I learnt a lot about condom use and other many things that we were not taught in class.*

However, despite the unlimited availability of IT-assisted intervention, the school lacked enough computers and reliable internet connections. For instance, one teacher remarked:

> *We don't have enough computers and internet. You have seen it yourself even. We need more connected computers, not just the three computers and a TV we have out of 146 students that need them … with few computers, it's hard for students access the program on their own and practice the things like the interactive games, and you know being able to get involved in that online counseling.*

And one student commented:

> *When they brought the WSWM at our school, I said, ahaa, I am going to get a chance of learning computer, but I have tried to learn but it is always many of us on one computer, so, I only have some limited skills.*

3.6 Intervention Tailoring

As indicated in the quotation below, teachers perceived that 'pumping' young people with 'too much [sexuality] information' especially that which is untailored and not age-sensitive would "make children impossible to control". Teachers also stressed the need to tailor the intervention to suit students' different needs and ages:

> *Also, I believe that students should be given different information depending for example on how old they are or what their circumstances are.*

4. DISCUSSION

4.1 Reliability of Internet-based Sexuality and HIV/AIDS Information

The IT-assisted intervention was perceived as a source of reliable information for students that would otherwise be misled by the unavailable and unregulated sexuality and HIV/AIDS information from the internet, televisions, newspapers, friends, peers and other unreliable sources of information. However, there were concerns of student's exposure to 'too much information' from the internet that could sexually spoil them. Studies (e.g. Rice et al., 2010; Young and Rice, 2011) report sexual-related risky behaviour (e.g. commercialisation of sex and online partner seeking) resulting from youth's use of internet and social media. Related to this, Bull et al. (2001) affirms information reliability/quality as a major barrier to the utilisation internet-based STD/HIV-related information. The quality/reliability/trust of health-related information posted on the unregulated internet sites may not be guaranteed (e.g. see Adams and De Bont, 2007). Benotsch et al. (2006) reports the inability of HIV/AIDS' patients to make distinctions between 'high-quality' and 'low-quality' of internet-based HIV education information available online. However, information posted on the WSWM online support centre is edited by counsellors before its publication. The important role played by such intermediaries in ensuring reliability of internet-based health-related information is acknowledged by Eysenbach (2008). In light of this, there is need to assess:

- The challenges presented by un-moderated sexuality and HIV online sources and how such challenges can be overcome.
- The extent to which young people can make sense of the contents of sexuality and HIV online sources.
- The effectiveness of moderated versus un-moderated sexuality and HIV online sources.

4.2 Coping Strategies for Overcoming HIV Risky Situations and Behaviours

The intervention was a useful source of source of social support and coping strategies inform of peer-based learning and sharing of experiences and coping strategies from students, peers and counsellors. Such experience-based communications was an important source of encouragement and empowerment especially from peers who have overcome HIV risky situations and behaviours to fellows who were attempting to overcome HIV risky situations and behaviours.

Such social interactions, peer-based learning and sharing of coping strategies from individuals who have overcome HIV risky behaviours can be significantly important in

encouraging peers who are still struggling to change their risky sexual behaviours as well as those who are in relapse stage (Kalichman et al., 2006).

4.3 Level of Engagement and Confidence

The IT-based nature of the intervention helped teachers deliver contents that they would otherwise feel embarrassed to tackle in front of their students. The system also empowered the youth to be actively involved in their since it includes games and interactive sessions, and boosted their confidence in consuming materials that they would otherwise render too sensitive. Kalichman et al. (2002), Levine et al. (2008), Temesgen et al. (2006), and Rhodes (2004) also acknowledge the role of IT-assisted HIV interventions in addressing the challenges of confidentiality, stigma and discrimination associated with face-to-face sexuality and HIV/AIDS education.

4.4 Accessibility of the Otherwise Denied/Inaccessible Sexuality and HIV Information

The online-based nature of the intervention provided unlimited accessibility to sexuality and HIV/AIDS information irrespective of geographical boundaries and the prevailing silence and denial. Such unlimited accessibility allowed students to virtually access and/or discuss/share critical sexual health issues that affect their lives, that they would otherwise not been able to discuss due to geographical barriers and social denials. IT can be instrumental in anonymously conveying the otherwise taboo-related messages of sexuality and HIV prevention. Students were able to access useful sexuality and HIV/AIDS information (e.g. information on condom use) from the WSWM online support centre. Such information would not otherwise be available for young people due to the prevailing silence and denial associated with the subject of sexuality.

Unlimited accessibility made it possible to generate a pool of knowledge from different counsellors and peers with different expertises and experiences in sexual health and HIV issues. Although not necessarily accessing HIV-related information in particular, the role of the internet in facilitating unlimited accessibility of health-related information is reported in literature (Coulson and Knibb 2007). Such kind of accessibility and connection of the otherwise inaccessible information and disconnected communities is vital in obtaining generating useful health-related information.

However, a variety of questions regarding this accessibility remain unanswered:

- Does the online accessibility of sexuality and HIV information have effect on the frequency of young people's consultations with facility-based sexual health services?
- Does the online accessibility of sexuality and HIV information have effect on the relationship between young people and facility-based sexual health consultants?
- What particularly motivates young people to seek sexuality and HIV information from online sources?

Despite the potentials of unlimited accessibility, there were accessibility constraints due to limited computers and internet connections. Lack of computers and internet led to partial or no coverage of discussion forums and interactive HIV/AIDS prevention games, and also limited students' involvement in online counseling sessions. Challenges of accessibility of IT-based health interventions especially among the hard to reach populations are not uncommon (Wootton et al., 2011; Zolfo et al., 2006; Kalichman et al., 2002).

Such accessibility challenges constrain the utilisation of internet-based HIV prevention information (Bull et al., 2001). Given the vulnerability of students in this school, lack of

internet indicates the possibility of health disparity between the technology "haves" and the "have-nots". Measures to address such disparities and minimise digital exclusion are urgently needed.

Compared to computer-based technologies, mobile phone-based technologies promise to address the challenges of digital divide. This is due to their increased adoption in low resource countries including Uganda. Mobile penetration has a digital lag of less than 10 years while that of internet penetration is between 14 to 15 years (Heeks, 2010). This implies that it will take less than 10 years for the adoption of mobile phones in developing countries to reach the adoption level in the rich nations, and between 14 to 15 years for the penetration of the internet to do so.

Other reasons for limited application of internet technologies in low resource countries include lack of computers, network unreliability, low internet accessibility, and low levels of computer literacy (Wootton et al., 2011). The use of open source health technologies (e.g. OpenMRS) and outsourced technological healthcare services can be promising cost-saving strategies for utilising health technologies in countries with limited resources.

4.5 Intervention Tailoring for Needs Appropriateness:

Issues what of what content is appropriate for what age remain contentious. There was concern over the intervention's provision of the same sexual and HIV education information to young people of different needs and ages. Stakeholders have long been concerned of the age-appropriateness of sexual health interventions and suggest the need for intervention tailoring to suit differing needs of young people (Wantland et al., 2004). It cannot be assumed that young people are all at the same level of sexual activeness and neither can it be assumed that they all have the same sexual health and HIV/AIDS education needs. Concerns of age and needs appropriateness can be addressed by exploiting the tailoring potentials of IT to design interventions that can better meet the differing needs of young people of different age groups. Rather than generic 'one-size fits all' interventions which assume that the young have similar needs, interventions need to target specific preventive methods to specific individuals. For instance: messages of abstinence and delay of sex onset can be targeted at young people who are not yet sexually active; while messages of condom use and secondary abstinence can be targeted at those who are already sexually active.

There is evidence that IT-assisted health interventions provide opportunities to tailor sexuality and HIV/AIDS interventions to the needs and preferences of the users (Lustria et al.,, 2009). However, many of the prevailing HIV prevention interactive websites are not tailored to user needs (Noar et al., 2006; Flicker et al., 2004). Tailoring interventions can be significantly helpful given that young people can have differing sexual needs and preferences e.g. depending age, level of sexual activity, self-efficacy, HIV/AIDS status, readiness to change, and level of HIV/AIDS vulnerability. Given that intervention website evaluated in this study does not tailor its information, there a need for tailoring this intervention in accordance to young people's needs and preference.

One area that requires further investigation assessing how IT-tailored sexuality and HIV interventions compare with those that are not tailored to user needs in terms of their influence on sexual behaviours.

5. LIMITATIONS

The selection of students to be interviewed was done by the intervention teachers. It is possible that intervention teachers selected students whom they believed were more likely to report 'good' things about the intervention. This would render their responses unrepresentative of many young people who have accessed the intervention. More valuable

results would have been obtained if a pre and post-intervention assessment was conducted with a relatively large number of participants, and if the influence of the indentified IT-related mediators on participants' sexual behaviour was also investigated.

6. CONCLUSION

This paper investigated the IT-mediated issues in the implementation of a IT-based sexuality and HIV/AIDS education (WSWM) intervention implemented in schools in Uganda. This investigation was a qualitative study that aimed at exploring in-depth the IT-mediated issues that influence the adoption of an IT-assisted sexuality and HIV/AIDS intervention. Data was collected from 30 students that had completed the intervention, 02 intervention teachers and 01 head of school. Findings indicate that unlike the traditional methods of HIV education, the use of IT helps youths to unlimitedly access reliable, confidential and interactive sexual health/ /HIV/AIDS information and online social support.

This is very important given that young people in Uganda are normally denied of friendly, confidential, reliable, interactive sexual health/ /HIV/AIDS information and services. Such reliable information can save the youths from getting misleading information from friends, peers and media. Ensuring confidentiality is not an option given the sensitive nature of sexual health/ /HIV/AIDS information. Overall, IT-assisted sexual health and HIV/AIDS interventions have the potential to innovatively disseminate HIV prevention messages to secondary school youth coming from diverse backgrounds. Such innovative approaches promises to address the persistently reported challenges associated with traditional approaches to sexual health and HIV education. Despite these advantages, limited availability of computers and internet connections constrained the utilisation of the intervention. Another issue of concern that was raised is the possibility of parents losing control of their children's sexual lives due to availability of too much sexual information and services from the internet.

This research contributes useful insights, on an area that has been largely missing in literature. Computer-assisted interventions present an opportunity to innovatively and confidentially satisfy the unmet sexual health and HIV education needs of young people in low resource countries. This is particularly true given the prevailing shortage of trained health education teachers, health illiteracy, poor communication, minimal resources, prevalence of disease and other barriers to health education. Other possible forms of computer-assisted HIV/AIDS interventions include provision of HIV/AIDS information in chat rooms, sending of mobile messages for HIV testing referrals, real time remote antiretroviral adherence reminders and monitoring, as well as systems to manage treatment records of people living with HIV.

There is evidence that IT-assisted sexuality and HIV interventions increase young people's knowledge of HIV/AIDS, change their risky attitudes and influence their HIV self-efficacy (Musiimenta 2012a; 2012b). These interventions are even more beneficial when developed and implemented with input from both the target population and the general HIV community whom such interventions are meant to serve. Stakeholder involvement is more likely to result in interventions that are not only culturally acceptable but also effectively meet their information needs and expectations.

Despite the potential advantages, there are significantly few studies evaluating school-based IT-assisted HIV/AIDS interventions in developing countries.

Moreover, the HIV/AIDS-related burdens on healthcare systems in developing countries as well as economic burdens (e.g. lost output in productivity due to HIV deaths and sickness) are sufficiently severe to justify the need to use modern communication technologies in the fight against HIV. However, due to limited and unreliable internet connections, Africa, the

continent with the highest prevalent rates of HIV/AIDS, relies heavily on traditional forms of IT, e.g. radio and television, to disseminate AIDS information. Generally, many of the IT-assisted HIV/AIDS interventions have been evaluated in the developed world. Little to no research in this area reports from the experience of developing countries although the pandemic is widespread. Nevertheless, the outcomes of evaluations based in developed countries cannot be assumed to be generalised to the developing world given the differences in culture, technological infrastructure, skills, and HIV/AIDS prevalent rates.

Generally, it can be affirmed that IT provide innovative ways of reaching out to the youth with educative sexual health and HIV/AIDs information.

As discussed above, many of the identified IT-mediated issues have been reported in literature although not necessarily in the contexts of sexuality and HIV/AIDS education. This papers adds to the existing body of literature on using IT for health education by focusing on health aspects (sexuality and HIV) that have for decades been challenging to deliver using traditional approaches. This is mainly due to the sensitive nature, silence and denial, stigma and discrimination associated with sexuality and HIV/AIDS. The identified IT-mediated issues can provide important aspects to guide the design, development, implementation and evaluation of IT-assisted sexuality and HIV/AIDS intervention.

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