

The Five E's for Health: Understanding eLiteracies for eLearning in Electronic Educational Environments

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eLiteracies for eLearning in Electronic Educational Environments

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Executive Summary

Youth are enthusiastic consumers of electronic media and attracted to the Internet. Internet access brings novel opportunities to reach youth with health promotion messages, through a medium that permits customization and the opportunity to network knowledge between individuals or entire classrooms. Two established virtual classroom environments, one on tobacco control and one on HIV/AIDS, provide teachers and students with a means of learning about health and connecting with youth worldwide via a global youth action network. The impact of these programs on student learning and engagement and teacher collaboration was evaluated with two-hundred and thirty three youth participants and five teachers, using surveys and interviews, with the goal of creating recommendations for health and education programming and policy.

Both TIGXpress HIV/AIDS and the Virtual Classroom for Tobacco Control were found to be strong and attractive methods for student learning. A majority of respondents enjoyed the programs, learned new things and felt that the format and material were preferable to other more traditional methods of learning about HIV and tobacco control. Teachers found the virtual classrooms very easy to use and attractive as a method of engaging their students in the content. Interviews with teachers indicate that the programs offer a clear innovation that married technology with enhancements to face-to-face or more traditional styles of teaching and learning. Most participants reported a high level of eHealth literacy; the highest average

rate since this variable was first measured, with more than 50% of participants reporting either agree or strongly agree with all of the eight core items in the eHealth Literacy Scale.

The challenge, however, is an ongoing lack of organizational structures to allow teachers and students to benefit from interactive programs. Citing time pressures and the lack of access to appropriate technology, most schools approached to participate in this study declined the opportunity – in spite of teacher interest and intention to participate. Those who did participate were found to be progressive educators committed to innovation and interested in the expanding potential of new learning resources. There is a need for mechanisms that enable innovations in education, to understand what schools and teachers need in order to integrate these resources and overcome barriers to their use, so that all students have the opportunity to benefit from new tools and technologies.

1. Justification & Background

Engaging young people in health promotion is a challenge that has been a struggle for community, health and social services to meet. One of the strategies that shows efficacy in this area is using information technology as the mechanism for engagement (Norman & Skinner, 2007), particularly with Canadian youth who are the most ‘wired’ population on earth, with a 100 per cent penetration rate (Environics Research Group, 2001). Tying health promotion to education reflects a larger understanding of the social determinants of health (Evans, Barer, & Marmor, 1994), as those with more education are more likely to be healthy than those with fewer learning opportunities. Internet access brings novel opportunities to reach youth with health promotion messages, through a medium that permits customization and the opportunity to network knowledge between individuals or entire classrooms. While the Internet remains a popular source for health information, many young people report that they do not have the knowledge, skills, and ability to use the medium effectively (Gray, Klein, Cantrill, & Noyce, 2002; Gray, Klein, Sesselberg, Cantrill, & Noyce, 2003). eHealth resources are one way to provide a supportive environment for teaching about health, while also addressing literacy issues.

Literacy is another social determinant of health, and a bigger problem than many Canadians realize, with 43% having literacy skills that fall below what is considered optimal to engage in everyday activities (Canadian Council on Learning, 2007). Health literacy is a special skill that builds on this foundation. Health literacy has been identified as a top public health goal for the 21st century, and a significant challenge facing health care globally (Nutbeam, 2000; Rootman, 2003). Ratzan and Parker (2000) describe health literacy as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions”. The Institute of Medicine report on health literacy encouraged educators and health professionals to consider the contextual factors that influence how health information is obtained and understood as part of a health literacy strategy (Institute of Medicine, 2004). This context is increasingly being seen as a critical part of understanding the health needs of the public (Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs of the American Medical Association, 1999; American Medical

Association Council on Scientific Affairs Ad Hoc Committee on Health Literacy, 1999; Canadian Public Health Association, 2000; Smith & Haggerty, 2003).

As we witness the impact that basic literacy has on health outcomes, questions arise about how literacy affects eHealth-related outcomes and experiences (McCray, 2005). Engaging in eHealth requires basic reading and writing skills, working knowledge of computers, a basic understanding of science, and an appreciation of the social context that mediates how online health information is produced, transmitted, and received. This combination of necessary skills is called *eHealth literacy* (Norman & Skinner, 2006b). A multi-country study of information technology use and literacy found that as literacy skill levels rise, the perceived usefulness of computers, diversity and intensity of Internet use, and use of computers for task-oriented purposes rise with it, even when factors such as age, income, and education levels are taken into account (Veenhof, Clermont, & Sciadis, 2005). The need to navigate the Internet with confidence is particularly important for health issues where the consequences of using low quality, misleading or false information are great (Eysenbach, 2002). Areas of particular concern are HIV-related health information (Flicker et al., 2004), and tobacco control (Bock et al., 2004; Koo & Skinner, 2003).

1.1. Health Challenges Facing Youth

Literacy cannot be considered outside of the context of the environments in which literacy skills are to be used. In terms of health, it means framing literacy issues within the context of health problems that youth are most likely to ask questions about and seek answers for. Two specific areas of relevance for youth are tobacco use and HIV/AIDS.

1.1.1. Tobacco Use & Smoking Cessation

Cigarette smoking is a habit that, in North America, is initiated almost exclusively in youth (ages 12-24 years), with nearly one in five young people reporting using cigarettes (Health Canada, 2005). Tobacco use accounts for 22 per cent of all disease-related deaths in Canada (Makomaski Illing & Kaiserman, 1999) and the premature death of 4.9 million people worldwide (Shafey, Dolwick, & Guindon, 2003). The World Health Organization (WHO)

estimates that half the current smokers today (about 650 million people) will die as a result of tobacco use (Shafey et al., 2003), precipitating a need to provide cessation resources widely. Web-assisted tobacco interventions (WATI) are a class of technology-enabled behavioural interventions that have become popular because of their ease of proliferation, scalability and relatively low-cost, all critical components of an efficacious population-health tobacco control intervention (Niaura & Abrams, 2002).

One example of a WATI approach for adolescents is TeenNet's *Smoking Zine* (www.SmokingZine.org). *The Smoking Zine* is an interactive, multilingual tobacco program that takes a population health approach to adolescent smoking -- focusing on youth whether they are active smokers or not. It features interactive games that promote critical thinking about tobacco use, along with tailored assessment and guided self-change tools. Developed with youth and employing sound models of behaviour change, *The Smoking Zine* promotes readiness for change with smokers, and fosters resistance to smoking initiation with non-smokers. Smokers who are ready to quit can also use *The Smoking Zine* to create a personalized quit plan.

In 2005/2006 TeenNet (now Youth Voices Research) partnered with TakingITGlobal to create a *Virtual Classroom on Tobacco Control* (www.TIGed.org/tobacco), which integrates *The Smoking Zine* within a broader tobacco control framework. The Classroom contains four inter-related units:

1. *Facts and Figures* on the health effects of tobacco, from both a first and second-hand perspective;
2. *The Smoking Zine*, with an accompanying teacher's guide to assist in implementation of the program;
3. *Tobacco Industry Denormalization* focusing on how youth are targeted and highlighting avenues for youth action; and
4. *Global and Social Justice* issues surrounding exploitative tobacco industry practices in developing regions of the globe.

The *Virtual Classroom on Tobacco Control* represents the evolution of health promotion technology and combined research efforts that continue to keep Youth Voices current in its application of best practices for tobacco control.

1.1.2. HIV/AIDS

HIV/AIDS represents a global crisis with young people emerging as the most affected group of all sectors of the population (UNAIDS, 2004). Global efforts have been mobilized to address the burden of HIV/AIDS on specific vulnerable parts of the world. Messaging around the HIV/AIDS epidemic, however, may be contributing to a first world/ third world dichotomy that contributes to global stratification and threatens to seriously undermine prevention efforts. Efforts to provide education have proven problematic as the messages have reached a saturation point in some cases. South African youth complain of information overload, a situation captured in their claims to be "sick of AIDS". Canadian youth report that they know very little about AIDS and do not consider themselves to be at risk (Larkin & Mitchell, 2003).

One of the possible reasons for this problem is that the messages created for youth do not reflect the everyday existence of youth in relation to the experience with the disease and its risk conditions. There is increasing recognition by researchers, educators, and organizations such as UNICEF and UNESCO that unless youth are given a more significant role in producing relevant messages, prevention programs are doomed to failure (Ford, Odallo, & Chorlton, in press). Multimedia can be powerful tools for allowing young people to develop their own messages and representations of issues like HIV/AIDS. Technologies such as photography, video and the Internet can be used to create interactive educational tools in which young people become both the creators and consumers of knowledge (Tyner & Mokund, 2003). The Toronto District School Board has identified the potential for Information and Communication Technologies to serve as "learning tools that provide meaningful opportunities for students to grow as learners and develop essential academic and life skills" (Toronto District School Board, 2004).

TIGXpress HIV/AIDS (www.TIGed.org/TIGXpress) draws on photography and the Internet for participatory, youth-driven HIV education. Through a process called Photovoice (Wang & Burris, 1997), youth from Toronto and South Africa used disposable cameras to investigate vulnerability to HIV infection within their communities. The resulting photos were used to create an educational toolkit with a focus on five main areas of HIV vulnerability: Gender, Migration, Stigma, Poverty and Access to Treatment. The toolkit and photo exhibit are housed within a TIGed virtual classroom, providing an educational tool based on social justice, cross-cultural communication and global solidarity between youth. Through the interactivity features of the classroom, youth can view and comment on each other's photos, and post their own.

1.1.3. Models and strategies for change.

The Likelihood of Action Index (LAI) (Norman, 2005; Skinner, 2002), a multi-theory approach to understanding health behaviour, is a tool that provides an assessment of the factors that are most likely to lead to change. The LAI, proposed by Skinner (2002), views health behaviour as both complex and being motivated by factors that are shared among various models of health behaviour change. The LAI encompasses elements of social cognitive (learning) theory, self-determination theory, the Theory of Planned Behaviour, and the Transtheoretical Model and Stages of Change.

Consistent with self-determination theory, the application of Paulo Friere's critical pedagogy (Freire, 1970, 1973) to the application of technology to health promotion provides a means of framing youth engagement in the delivery of interventions. Friere's approach to education and literacy argues that listening precedes dialogue, which precedes action. Thus, intervention tools must provide environments that encourage people to speak and be heard and to discuss ideas in a dialogical manner. In doing so, skills are developed, consciousness is raised, and motivation to act both individually and collectively is heightened.

Part of this learning experience is mediated not only by the dialogue that takes place, but also the capacity to frame problems in light of the technologies that are being used to support learning for health. With this in mind, the concept of eHealth literacy was proposed as an articulation of the skill set necessary to properly navigate through the electronic information

environment and apply the lessons learned from this context to promote health in general (Norman & Skinner, 2006b). Ehealth literacy is measured using a 10-item scale that uses self-report assessment of comfort in seeking, evaluating and applying health information online to a health issue(Norman & Skinner, 2006a). The eHealth Literacy Scale (eHEALS) has been shown to have high internal consistency and test-retest reliability in trials with youth and young adults in school settings as well as with adults in a population sample (Norman, 2007; Norman & Skinner, 2006a).

Another method of change via knowledge exchange is the development of a community of practice. Communities of practice (CoP) are self-organized, voluntary, focused collectives of people and organizations who work toward common understanding on a given issue (EC Wenger, 1998; EC Wenger & Snyder, 2000). Communities of practice use resources efficiently, help drive strategy, elucidate and transfer best practices, cultivate partnerships, develop professional skills, and promote rapid dissemination of knowledge within teams and groups with a common purpose (EC Wenger & Snyder, 2000). The CoP approach encourages self-organization and is suited for environments or contexts that lack a rigid structure or centralized leadership, such as schools(E. Wenger, McDermott, & Snyder, 2002). By organizing around the delivery of interventions through creating virtual learning communities of support for educators, it is possible to affect wider scale adoption of new learning tools.

2. Research Questions

The current research is guided by the following questions:

1. What is the relationship between eHealth literacy skills and student engagement and satisfaction with the virtual classrooms?
2. What impact do the virtual classrooms have on student learning and engagement as measured by students' attitudes, perceived learning, behavioural intentions and levels of satisfaction?
3. What is the impact of the TIGed program on teachers' collaboration, knowledge exchange and adoption of the virtual classroom programs?

4. How does exposure to the virtual classrooms influence social networks for learning among students?
5. How does exposure to the TIGed programs influence social networks for learning among teachers?
6. What is the experience of teachers in using the virtual classrooms and TIGed programs, and how has it influenced their teaching?

3. Objectives

The objectives for this project were to explore and evaluate the role of electronic classrooms in promoting health and to understand the role that literacy skills play in facilitating the optimal use of these tools for learning.

4. Methods

4.1. Participants and Recruitment

Participant recruitment was initiated through the TakingITGlobal network of schools and classrooms. This strategy proved to be difficult as many of the schools involved in the TakingITGlobal network were not able to participate due to time constraints. Indeed, the change in culture among many schools has indicated that the need to adapt recruitment strategies and re-think the ways that schools engage with novel educational methods is paramount to success. Recruitment took place using a snowball approach, whereby successful teacher recruits referred the research team on to other colleagues. This had the benefit of ensuring a higher likelihood of cooperation and interest in the goals of the project, but also reduced the variation in the sample compared to a random sample approach. Nonetheless, a random sample approach is impractical and unlikely to be effective as school participation is completely voluntary and that access to classrooms that can enable use of electronic classrooms is also not equal among schools. In the process of recruitment and discussion about participation with the schools and teachers, notes were taken to reflect the challenges and

enable us to draw some preliminary hypotheses regarding the reasons for this more difficult-than-anticipated process.

The original target was to recruit at least 500 students through an estimated 20 classrooms at different schools. The actual number of students recruited was 230 at 10 classes in two schools. One school was based in Toronto Ontario, the other in Winnipeg Manitoba. Classes involved were grade seven, eight, nine and ten students, 106 boys and 124 girls.

4.2. Instrumentation and Procedure

The virtual classrooms were evaluated using an instrument adapted from the Likelihood of Action Scale for Adolescent Smokers (LASS-A) that has been empirically tested in other studies and psychometrically assessed to be a reliable and valid method of evaluating behaviour change with young people. The instrument measures knowledge, attitudes, and perceived skill using items that are largely based on a five point likert scale (1 = strongly agree to 5 = strongly disagree).

eHealth literacy levels were assessed using the eHealth Literacy Scale developed by Norman and Skinner (2006b). This measurement tool has been used in studies with adults and youth and has been shown to be consistent in its assessment of the concept of eHealth literacy developed by Norman and Skinner (2006a). The concept of eHealth literacy, developed from years of research with young people and other consumers using information technology for health has not undergone a full validation study.

Surveys were distributed to students in all classes that used the virtual classrooms upon the completion of the learning module as determined by the teachers themselves. Whenever possible, a member of the Youth Voices research team was on hand to support the survey distribution and collection. Surveys were distributed after the completion of the modules and only at one time point. The potential advantages of a pre-post design were offset by the inability to control the exact timing of the surveys within each classroom setting on account of the variety of class experiences and the time of year/semester that each virtual classroom experience was undertaken. It was felt that the inability to control these factors would limit the ability to make accurate claims based on the impact of the classrooms on learning outcomes.

Rather, the post-test only design allowed for some testing of procedures that could enable adaptation towards a quasi-experimental or controlled trial design in the future.

Interviews were conducted with all participating teachers within one month of the learning modules being completed. The individual, semi-structured interviews were used to gain understanding of the teacher experience and to evaluate the quality and experience of implementing the virtual classrooms in practice.

5. Results

Two-hundred and thirty (124 girls and 106 boys) youth participants took part in the study (See Table 1). A total of five teachers and ten classrooms were involved in the study.

Table 1: Sex distribution

Program	Sex	Number	Per cent involved (Intervention)
<i>TIGXpress (HIV/AIDS)</i>	Boys	77	44
	Girls	97	56
<i>Virtual Classroom on Tobacco Control</i>	Boys	29	52
	Girls	27	49

5.1. TIGXpress

Figures 1 to 6 highlight some of the key findings of the self-reported surveys completed in evaluation of the TIGXpress program. TIGXpress appeared to be a good method of learning for young people. Half of the sample agreed or strongly agreed with the statement “TIGXpress helped me learn more about HIV/AIDS better than other classes”. Sixty per cent agreed that it got them to think about HIV/AIDS in a new way. In terms of introducing students to new ideas about HIV/AIDS, 67 per cent reported learning that HIV is more than a health issue. Fifty-three per cent (N = 93) reported that TIGXpress taught them how to make a difference in their community with regards to HIV/AIDS.

Most students agreed that TIGXpress provided an innovation that was better or at least comparable to other methods of teaching about HIV/AIDS. Fifty-seven per cent expressed a desire for other similar issues to be taught the same way as HIV/AIDS was via TIGXpress, while 63 per cent would recommend that other teachers use the program in their work. Overall, nearly 60 per cent ($N = 99$) liked the program.

Figures 1 to 3: Impact of TIGXPress on learning about HIV/AIDS

Helped me learn about HIV/AIDS better than other classes

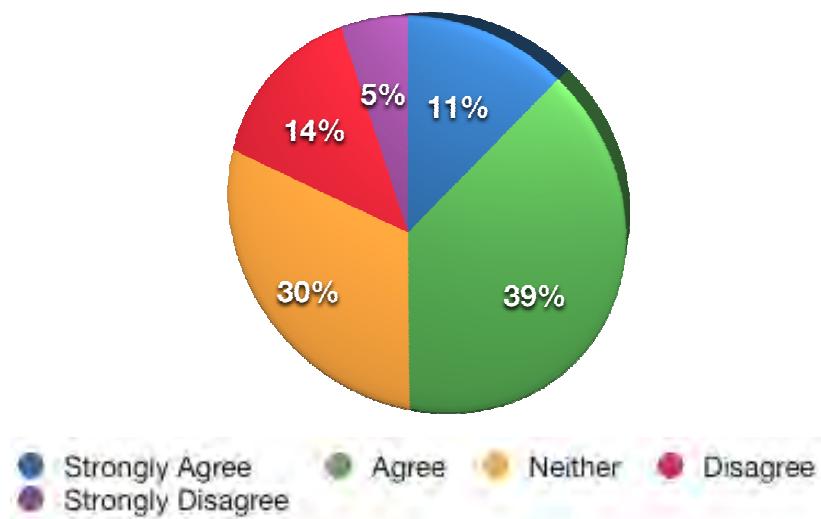


Figure 1

Got me to think about HIV/AIDS in a new way

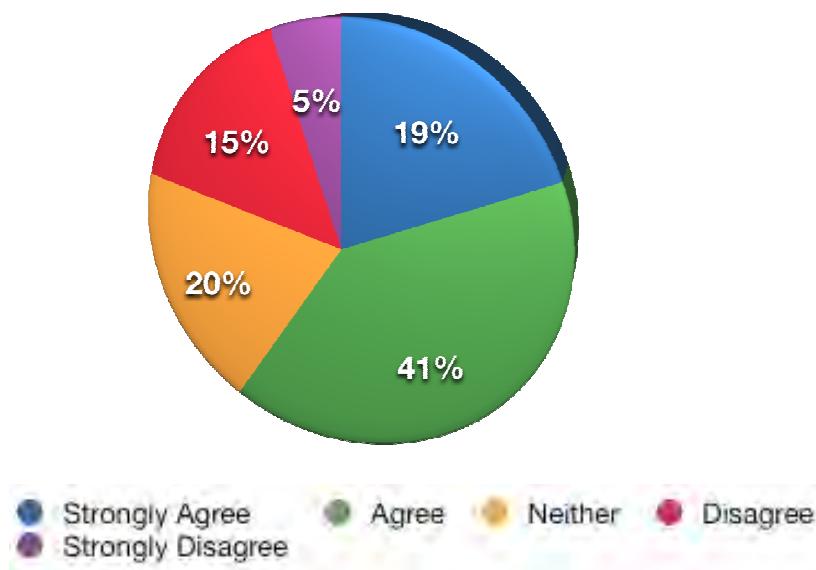


Figure 2

I learned that the HIV/AIDS pandemic is more than just a health issue

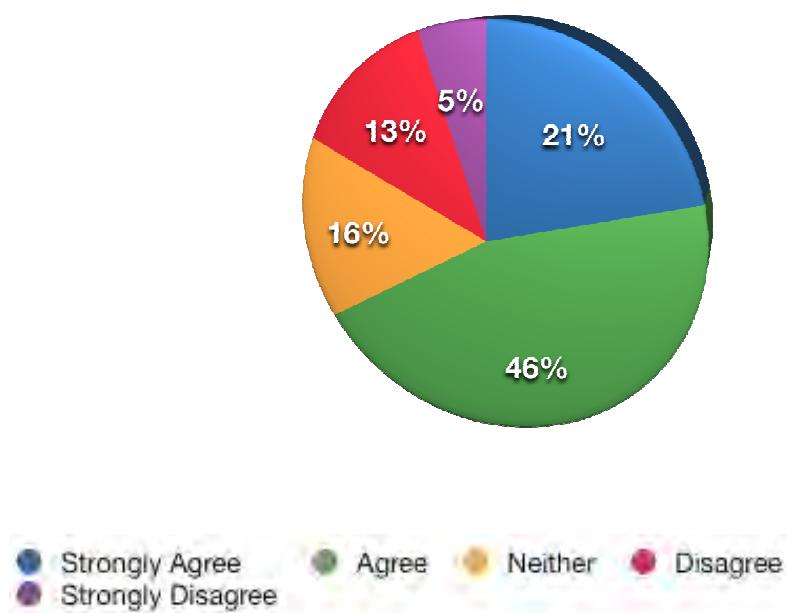


Figure 3

Figures 4 to 6: Perceived benefits of TiGxpress compared to traditional programming

Found TigXPress more interesting than other HIV/AIDS education programs

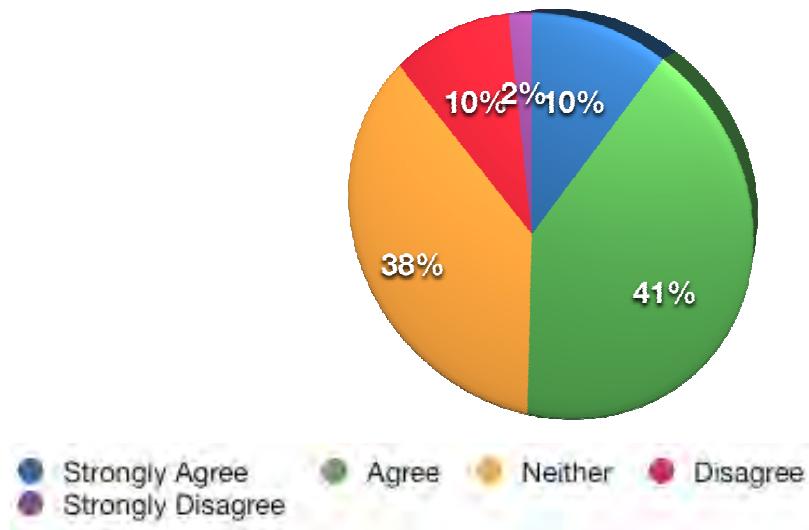


Figure 4

I recommend that other teachers use TiGxpress

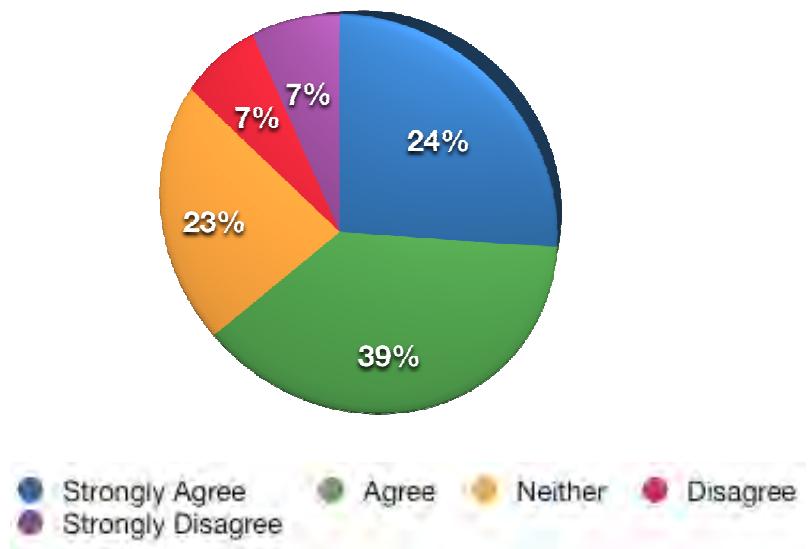


Figure 5

I liked the TIGXpress program

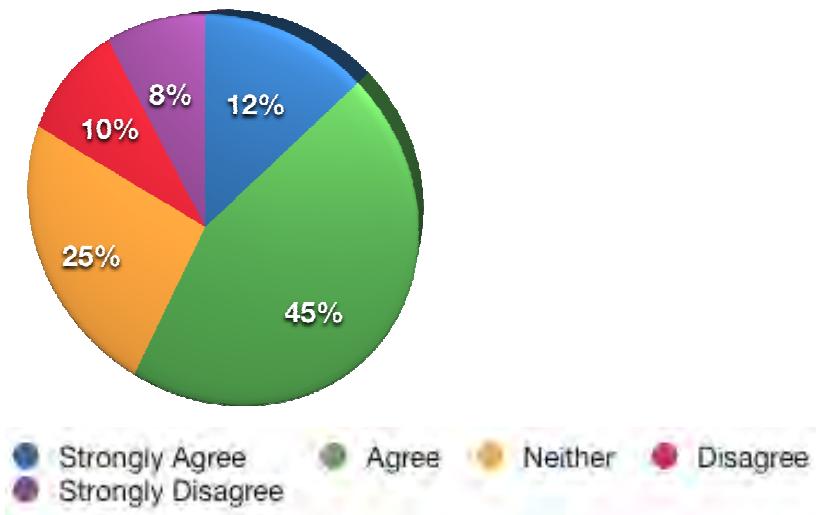


Figure 6

5.2. Virtual Classroom on Tobacco Control (VCTC)

Figures 7 – 13 show some of the highlights of the self-reported surveys completed in evaluation of the VCTC program. As a mechanism for informing participants about tobacco control, 53 per cent of participants agreed that the VCTC helped them learn about tobacco and more than 41 per cent found the information was novel and helped them think about tobacco in a new way. Fifty eight per cent of those who completed the VCTC ($N = 34$) agreed that the VCTC was a more interesting way to learn about tobacco control than other methods, with only 4 participants disagreeing.

This interest also translated into changes in knowledge and learning outcomes; 40 per cent of participants indicated that the program inspired them to think differently about the issue and more than 50 per cent learned that the tobacco issue is not just a health one. This suggests that the program provided new knowledge but, more importantly, introduced new information that extended what was already known in novel ways.

As a health promotion strategy, the program was also effective at promoting smoking resistance through education, with more than 56 per cent of participants agreeing that the VCTC taught them strategies to resist smoking. Usability was considered good for the program, with at least 48 per cent in agreement or strong agreement that it was easy to navigate the

program and to find the information necessary to learn from it, and 64 per cent reporting that it was easy to use. Thirty seven per cent would recommend the program to peers, while 64 per cent of participants thought that teachers should continue to use the VCTC to teach about tobacco issues. Over 65 per cent felt that the VCTC was more enjoyable than other methods of teaching the same subject.

Figures 7 – 9: Impact of VCTC on cigarette use

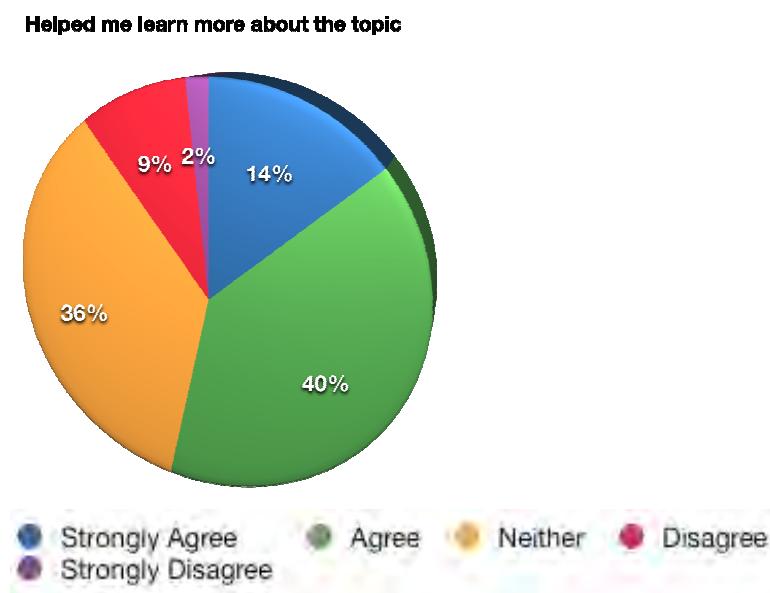


Figure 7

Got me to think in new ways

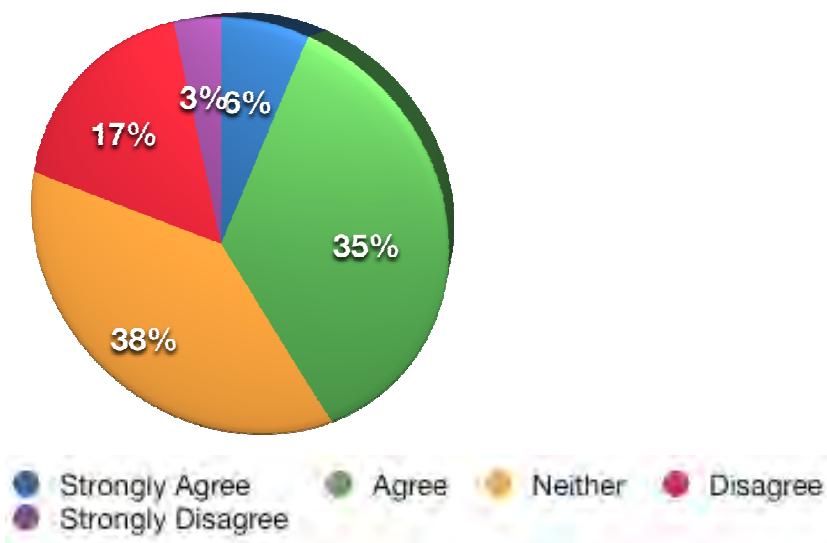


Figure 8

Taught me strategies to resist smoking

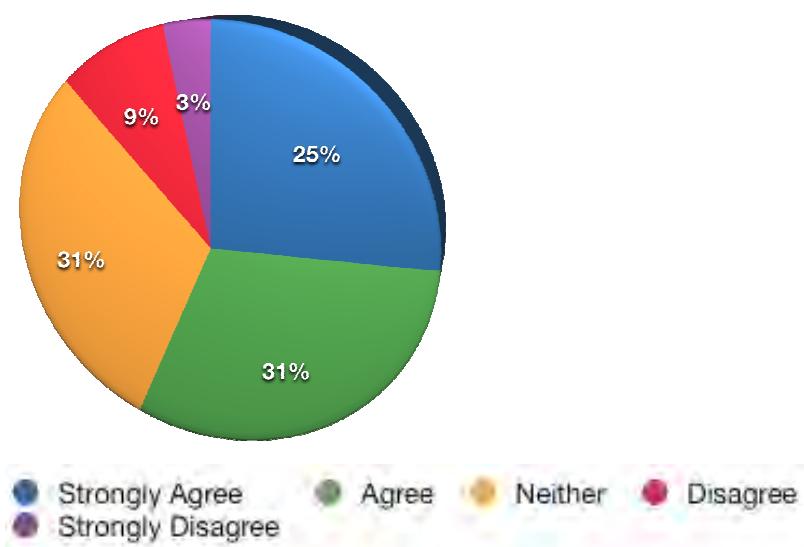


Figure 9

Figure 10-11: Perceived benefits of VCTC compared to traditional programming

More enjoyable than other methods of learning about the topic

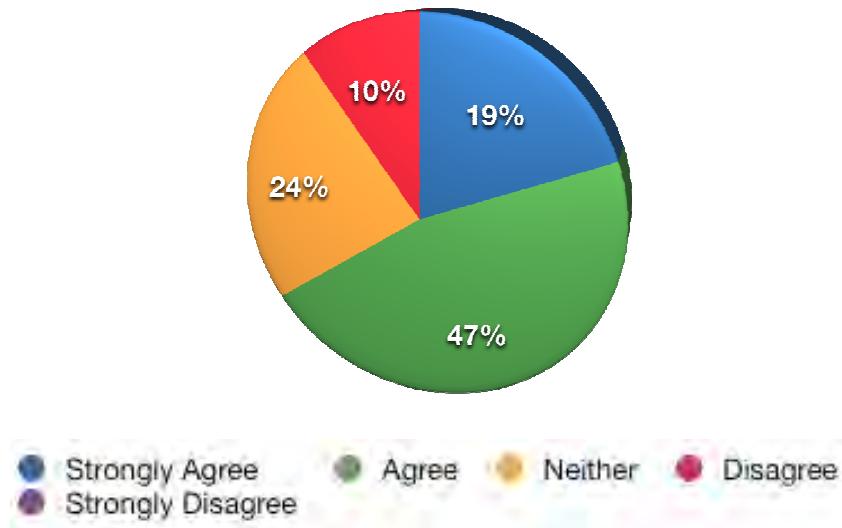


Figure 10

I liked the virtual classroom program

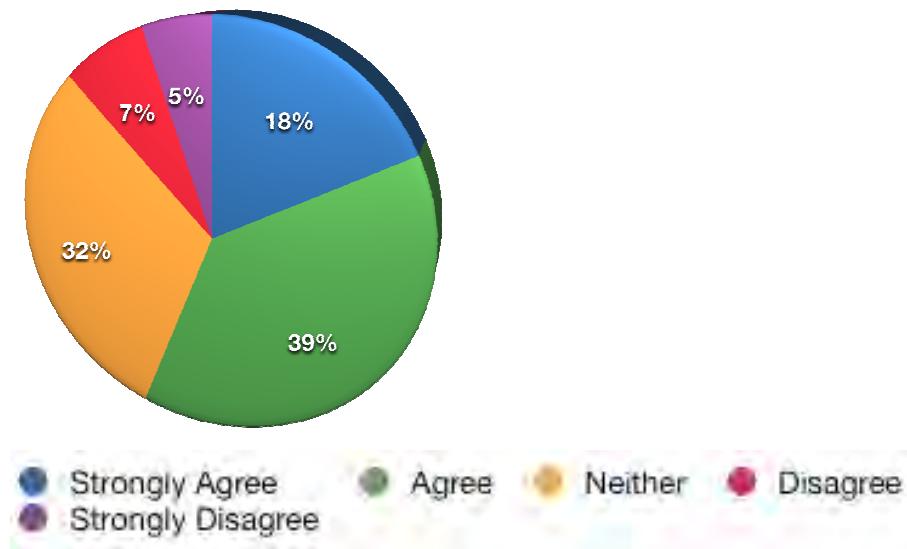


Figure 11

5.3. eHealth Literacy

Most participants reported a high level of eHealth literacy; the highest average rate since this variable was first measured in studies conducted in 2003, with more than 50% of participants reporting either agree or strongly agree with all of the eight core items in the eHealth Literacy Scale(Norman & Skinner, 2006a). Indeed, 57% of participants scored in the highest quartile for eHealth literacy scores. Only 4 participants in total responded in the lowest quartile, with less than 4 per cent scoring in the bottom half of the scale. This finding suggests that, unlike previous research studies, which showed a less skewed sample, that young people are becoming much more comfortable with using technological options to learn about health. As these scores were not measured pre-intervention, it is not possible to say whether these high scores could be attributed to the virtual classrooms or in what degree.

Although the scores were negatively skewed towards high levels of eHealth literacy, the overall median score was 31 out of a possible 40 points. So while this represents the highest quartile in terms of scores, it also indicates that there is room to grow and that there is still uncertainty among young people in terms of how well they can use the Internet and related tools for health.

Confirmatory factor analysis of the eHealth literacy Scale (eHEALS) suggests that the instruments reliability remains consistent with the original findings (Norman & Skinner, 2006a), with the responses showing a single factor structure.

5.4. Technology Use

The results from this study suggest that the digital divide is increasingly becoming about the opportunity to engage with a technology more regularly than to engage at all, with nearly all participants reporting using various information technologies daily from a high of 77 per cent with email. Most technologies were used multiple times per week to communicate and learn, suggesting that information technologies command a lot of attention over the course of a week, in multiple modalities. Nearly all of the participants in the study reported using all but video message technology and text messaging on a regular basis. The former is likely due to its

relatively new emergence into Canada, the limited number of wireless carriers and handsets that can accommodate this new method of communication and cost.

While technology is familiar to youth, the virtual classroom programs were still ‘fresh’ enough to maintain their interest. Both programs were considered better options for learning about health issues than traditional means (See Figures 3-5 and 10-11 for details on the satisfaction scores for both programs).

Table 2: Use of technology

Technology	Daily use N (% responded to multiple times/day or 1-2 times per day)
Social Network Websites	111 (48)
Instant Message	145 (63)
Video Message	35 (15)
Email	175 (77)
Cellphone	112 (53)
Text Message	67 (29)

5.5. Community of Practice Development & Social Network Analysis

Participating teachers indicated that they were unable to utilize the full features of the TIGed environment as planned, despite having expressed interest in such a feature. This was in large part due to an absence of resources (e.g. “not enough time in the day”) and support for engaging in participatory learning with their peers. Although teachers were very positive about this opportunity, they were not in a position to take advantage of it. Therefore, the analysis and study of the community of practice was unable to proceed as planned.

With regards to connecting their classrooms to others via the TIGed site, resource constraints were also cited. However, in this case the issue was more related to time available to foster coordination and organize with other teachers using the TIG classroom. This limitation – consistent across all schools – prevented the planned social network analysis from taking place as classrooms did not extend their networks beyond the school via TIGed to enable meaningful study.

5.6. Social Action

Both tobacco and HIV/AIDS have been shown in previous studies by Youth Voices to be issues that engage young people if given opportunities to contribute and provide leadership. As Table 3 shows, a higher percentage of youth were interested in taking action on HIV/AIDS than tobacco. This could be due to the fact that youth engagement strategies in tobacco control are well-established and implemented and have been around for a longer period of time, or that youth find HIV/AIDS a more compelling issue. Regardless, the differences between the two groups were significant, with 42 per cent of participants who completed the TIGXpress program responding that they intend to take action on HIV/AIDS in the coming year (15% in the next month), while only 16 per cent of those who completed the VCTC intended to do the same in tobacco (9% in the next 30 days).

Table 3: Intention to engage in social action

Program	Intention for Social Action	N	% of total
VCTC	Tobacco Control-related social action intentions (readiness for change)		
	Next year	9	16
	Next six months	7	12
	Next 30 days	5	9
TIGXPress	HIV/AIDS-related social action intentions (readiness for change)		
	Next year	74	42
	Next six months	55	31
	Next 30 days	26	15

5.7. Community Connection

Using two variables adapted from Statistics Canada's Canadian Community Health Survey (CCHS), participants' connection to their community was measured as a means of inferring possible reasons for engaging in community action or collaborative, community-style learning with others. Seventy five per cent of all participants ($N = 171$) felt a sense of connection to their local community. Although positive, only 33 participants (14%) endorsed

this at the highest level. More troubling is the fact that 13 participants felt very disconnected from their communities.

A second question related to sense of belonging showed that youth feel a lower sense of belonging than they do connection to community. Sixty-seven per cent of participants felt a strong or somewhat strong sense of belonging to their community. Conversely, nearly one in 10 reported having a very weak sense of belonging to their community, suggesting that social alienation and isolation is a significant issue for many young people.

5.8 Teacher Experiences

Teachers found the virtual classrooms very easy to use and attractive as a method of engaging their students in the content:

"I found it so easy to teach from and to be honest with you; it's more interesting for them than for me to lecture or to do textbook work or whatever kinds of activities we do in health class. I really think the kids got a lot out of it. And the global perspective was key, some teachers might have difficulty teaching global studies or world issues or whatever but I find that more interesting to deal with and it's more interesting for them (kids) rather than what the side effects are of HIV"

"Overall, especially the kids who were interested in global issues, they were really interested in it...reading the blogs and their journal entries I found that the kids were really engaged and they made some really interesting comments."

"It was easy to teach from and I enjoyed teaching it. "

"The kids loved the online format especially because some of them work faster than others"

From a curriculum standpoint, it seemed that the programs hit the right balance with teachers:

"I think it was a good overview of the relationship between the micro and macro factors."

The most substantial problems were technological or organizational.

"The downside is the lab, the kids get distracted, they're checking their email right away so I could have been a little more strict about that."

"It was so easy in the way it ran...I think teachers would love this if they were able to access a lab, and I know that that is a huge issue (lab access) and that just wouldn't happen".

"Another difficulty that we did find is that things tended to freeze up a bit...I only found it once or twice but the rest of the time it went fine but when it did happen it was with the smoking zine".

In terms of content and the format of the content, some other suggestions were made:

"The action guide I found to be a little too much. I think it could be condensed a bit...or made into a lesson format. It would be much easier to use."

"I think more example might be helpful when talking about those five themes, for example migration...kids were like "What do you mean? How do they get HIV if they migrate?" So I used some common migration story...but some real concrete examples of what it means to migrate when there is a war...so making that connection would be helpful."

The programs appeared to offer a clear innovation that married technology with enhancements to face-to-face or more traditional styles of teaching and learning:

"The other thing that I thought was brilliant about it was the dialoguing that they could do in the discussion. That took off and all you heard for the whole period was (simulation of typing sound) and it was amazing you know. and once they figured out how to do it and how to post ...basically a new theme or a new topic and you can respond to everyone else's – well basically that was on fire, I loved that because they were so engaged the whole period."

"Program was easy to use and easy to get done. you can do it all in front of a computer you can plan everything right there and then you are good to go the next day and you can use it from home...and the kids can. I mean the lesson can happen outside of the classroom and inside of the classroom. It happens at more convenient times for all of us so that's fantastic."

6. Conclusions

This study sought to answer the following research questions within the context of an exploratory evaluation study of a new method of health instruction in Canadian classrooms:

1. What is the relationship between eHealth literacy skills and student engagement and satisfaction with the virtual classrooms?
2. What impact do the virtual classrooms have on student learning and engagement as measured by students' attitudes, perceived learning, behavioural intentions and levels of satisfaction?
3. What is the impact of the TIGed program on teachers' collaboration, knowledge exchange and adoption of the virtual classroom programs?

4. How does exposure to the virtual classrooms influence social networks for learning among students?
5. How does exposure to the TIGed programs influence social networks for learning among teachers?
6. What is the experience of teachers in using the virtual classrooms and TIGed programs, and how has it influenced their teaching?

The framing of the study was in the context of eHealth literacy, a set of skills considered to be critical to the effective navigation and application of learning in the online environment on health issues.

Our study found very few adolescents who were not actively engaged with information technology on a regular basis. Less than one per cent of participants had not been on a social network website, used instant messaging to communicate with a friend, or communicated via cellphone at some point in a usual week. This indicates that young people are actively engaged with information and communications technology and media as part of their everyday lives. Email remains as the most popular tool (52% using multiple times per day), and instant messaging (48%, cellphone (voice) (34%) and social network websites (28%) are the next most popular forms of communication. With each of these technologies, as particular set of communication and literacy skills are necessary to fully benefit from their use. Unlike video messaging, which is new and not yet widely used (15% daily), all but a cellphone require the fundamental literacy skills of reading and writing to use at the most basic level.

In terms of literacy skills and technology, most of the participants were considered 'high functioning' and literate in the use of technology to seek, find and apply potential solutions to health problems. EHealth literacy as assessed via the eHEALS tool is used to serve as a starting point for conversation and instruction about the use of information technology for health and is not a definitive assessment. It does, however, offer insight into young people's perceptions around the use of information technology tools as a means of learning about health. For educators, this high level of literacy provides an important opportunity to 'dig deeper' into the issue and provide opportunities for young people to explore this skill in greater detail. In terms

of literacy and health, providing young people with opportunities to consider complex health-related conditions such as tobacco or HIV/AIDS through structured search and application activities might illuminate whether or not perceived skill translates into real strength at using information and communication technologies for health.

Although it is not possible to derive cause-and-effect connections between the use of either program and social action intentions from the current study, the results invite speculation that each of the programs influence intentions differently or that there are inherent differences in youth's interest in tobacco and HIV/AIDS. More than twice the number of participants who were exposed to the TIGXpress program expressed intentions to engage in social action on HIV/AIDS than those who wanted to do the same with tobacco. This requires further exploration as it could have implications either for program development or in guiding health promotion efforts.

Social action may be a way to address issues of isolation as well. With over a third of participants in this sample feeling a weak sense of belonging to their community, the use of technologies to connect them to others or to issues of interest may provide an option. By inspiring young people through action-oriented learning that requires community-based activity and showing youth how other learners are engaged worldwide on similar issues, tools like the virtual classrooms might provide an outlet for adolescents to connect with their community.

The generalizability of the findings are limited because of a number of design issues. The study design relied on snowball sampling, which tends to attract populations of similar characteristics. This is a potential limitation of the findings, although the study itself was not intended to provide a truly representative sample given the number of complexities associated with computer-based learning and the fit between students, teachers and technologies across school conditions. To promote variation in the sample, efforts were made to engage schools in different settings, which resulted in schools recruited from downtown Toronto and an inner-city school in Winnipeg. The absence of a pre-post design prevented the ability to make clearer assertions about the possible impact of the program on learning. Although this was a design limitation, so too was the fact that teachers involved in the study chose to implement the

program as it fit with the specific context of their school rather than follow a strict protocol. While this reflects the reality of school-based programs and the diversity of classroom environments, it also poses a limitation in terms of how replicable the study could be in future research.

7. Implications

This study presents a potential paradox: virtual classrooms like TIGXpress and the Virtual Classroom for Tobacco Control provide an attractive and potentially effective educational tool for learners and classrooms, yet the organizational structures that enable teachers and students to benefit from these are not in place. Rather than provide opportunities to receive training and a free, curriculum-approved resource that offers substantial innovations over other methods, most schools approached to participate in this study declined the opportunity – in spite of teacher interest and intention to participate. This gap between what teachers want and students need and what school boards are willing to consider is something of concern for the future of electronic and network-based learning.

Our assessment of the schools and teachers that were involved in this study was that they were “exceptions, not the rule”. These innovative school environments facilitated new ways of learning. It was also because these teachers were committed to innovation that they were willing to persevere through technical problems. This persistence is what will enable teachers to adapt to changing conditions and seek responsive methods that are outside of the standard curriculum. It will also be this characteristic that will enable new tools like the virtual classrooms to become mainstreamed. However, until this comes about, the prospects for e-classrooms are limited in the short term, despite the evidence to suggest that they are effective and comparably more attractive to students.

Despite the barriers to implementation on a wide scale, the demand for new methods of learning about health will most strongly come from students, who clearly liked the virtual programs and reported learning from them. By linking the education benefits with the health and social dividend that is achieved by engaging young people in health issues and inspiring

them to take leadership and action on addressing them, the prospects for using virtual classrooms are enhanced tremendously.

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Appendix

The following survey will ask you questions about your experience with the TiGXpress program and about your comfort in using the Internet for health. Please put a check mark in the box next to your answer for each question.

1. Using the TiGXPress Virtual Classroom

The following questions are about your experience using the TiGXPress approach to learning about HIV/AIDS	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
1. I found TiGXPress more interesting than other HIV/AIDS education programs for youth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. TiGXPress helped me learn things about HIV/AIDS better than other health classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. TigXPress got me to think about HIV/AIDS in a new way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. TiGXPress was more enjoyable than other ways to learn about HIV/AIDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I learned that the HIV/AIDS pandemic is more than just a health issue through TiGXPress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Youth involvement is necessary to stop HIV/AIDS pandemic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. TiGXPress taught me how I could make a difference in my community on HIV/AIDS issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I recommend that other teachers use the TiGXPress program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I would like other health issues to be taught like the TiGXPress program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. HIV/AIDS is a problem that is under control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The HIV/AIDS pandemic does not need youth to be involved to be stopped	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I liked the TiGXPress program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. It is important for me to take action on HIV/AIDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I am confident that I can support effective action on HIV/AIDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I am confident that my skills can help support action on HIV/AIDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I intend to participate in some form of social action on HIV/AIDS in the next year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I intend to get involved in some form of social action on HIV/AIDS in the next six months	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I intend to get involved in some form of social action on HIV/AIDS in the next thirty days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	I Did Not Use the Website
19. I found the TiGXPress website easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I could find my way around the TiGXPress website without difficulty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I was able to find what I was looking on TiGXPress without difficulty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I would recommend the TiGXPress website to my friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I would recommend TakingITGlobal's website to my friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I visited the TiGXPress photo gallery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. Describe the **three main things** you learned from TIGXpress?

1.

2.

3.

2. Learning About Health Using the Internet

25. How **useful** do you feel the Internet is in helping you in making healthy choices?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Not useful at all	Not useful	Unsure	Useful	Very Useful

26. How **important** is it for you to be able to access health resources on the Internet?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Not useful at all	Not useful	Unsure	Useful	Very Useful

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
27. I know how to find helpful health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I know how to use the Internet to answer my questions about health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. I know what health resources are available on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I know where to find helpful health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. I know how to use the health information I find on the Internet to help me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I have the skills I need to evaluate the health resources I find on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. I can tell high quality health resources from low quality health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. I feel confident in using information from the Internet to make health decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. You and Technology

Choose the response that best reflects how many times you use the following technologies:	Many times a day	Once or twice per day	One or two or three days	About once or twice per week	Less than one day per week
35. Email (e.g., Gmail, Hotmail, Yahoo! Mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Online Social Network websites (e.g. Facebook, Bebo, MySpace)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Instant messaging (e.g., MSN,Yahoo! Messenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Video messaging (e.g., Skype, MSN, Yahoo!)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Cellphone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Text messaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Tell Us About Yourself

41. The age I am TODAY is _____

42. I am currently in grade:

- 1) 9
- 2) 10
- 3) 11
- 4) 12

43. I am a: 1) Female 2) Male

44. How connected do you feel to your local community?

- 1) Very connected
- 2) Somewhat connected
- 3) Disconnected
- 4) Very disconnected

45. How would you describe your sense of belonging to your local community?

- 1) Very strong
- 2) Somewhat strong
- 3) Somewhat weak
- 4) Very weak

Thank you for filling out this survey and lending your voice to this evaluation

The following survey will ask you questions about your experience with the Virtual Classroom program and about your comfort in using the Internet for health. Please put a check mark in the box next to your answer for each question.

1. Using the Virtual Classroom Virtual Classroom

The following questions are about your experience using the Virtual Classroom approach to learning about tobacco and smoking issues.	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
1. I found Virtual Classroom more interesting than other tobacco education programs for youth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Virtual Classroom helped me learn things about tobacco and smoking better than other health classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Virtual Classroom got me to think about tobacco and smoking in a new way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Virtual Classroom was more enjoyable than other ways to learn about tobacco and smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I learned that tobacco control is more than just a health issue through Virtual Classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Tobacco and smoking are global health problems that require youth action in order to be solved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Virtual Classroom taught me strategies to resist smoking, quit smoking or reduce my smoking use if I already use cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I recommend that other teachers use the Virtual Classroom program to teach health issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I would like other health issues to be taught like the Virtual Classroom program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Tobacco control will succeed without youth involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Tobacco and smoking is an issue that is under control around the world	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I liked the Virtual Classroom program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. It is important for me to stay or become smoke free	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I am confident that I can stay or become smoke free	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I am confident that I have the skills to stay or become smoke free	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I intend to participate in some form of social action on tobacco issues in the next year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I intend to get involved in some form of social action on tobacco issues in the next six months	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I intend to get involved in some form of social action on tobacco issues in the next thirty days	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	I Did Not Use the Website
19. I found the Virtual Classroom website easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I could find my way around the Virtual Classroom website without difficulty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I was able to find what I was looking on Virtual Classroom without difficulty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I would recommend the Virtual Classroom website to my friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I would recommend TakingITGlobal's website to my friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I visited the Smoking Zine website as part of the Virtual Classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. Describe the **three main things** you learned from Virtual Classroom?

1.	
2.	
3.	

2. Learning About Health Using the Internet

25. How **useful** do you feel the Internet is in helping you in making healthy choices?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Not useful at all	Not useful	Unsure	Useful	Very Useful

26. How **important** is it for you to be able to access health resources on the Internet?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Not useful at all	Not useful	Unsure	Useful	Very Useful

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
27. I know how to find helpful health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I know how to use the Internet to answer my questions about health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. I know what health resources are available on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I know where to find helpful health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. I know how to use the health information I find on the Internet to help me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I have the skills I need to evaluate the health resources I find on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. I can tell high quality health resources from low quality health resources on the Internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. I feel confident in using information from the Internet to make health decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. You and Technology

Choose the response that best reflects how many times you use the following technologies:	Many times a day	Once or twice per day	One or two or three days	About once or twice per week	Less than one day per week
35. Email (e.g., Gmail, Hotmail, Yahoo! Mail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Online Social Network websites (e.g. Facebook, Bebo, MySpace)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Instant messaging (e.g., MSN,Yahoo! Messenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Video messaging (e.g., Skype, MSN, Yahoo!)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Cellphone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Text messaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Tell Us About Yourself

41. The age I am TODAY is _____

42. I am currently in grade:

- 1) 9
- 2) 10
- 3) 11
- 4) 12

43. I am a: 1) Female 2) Male

44. How connected do you feel to your local community?

- 1) Very connected
- 2) Somewhat connected
- 3) Disconnected
- 4) Very disconnected

45. How would you describe your sense of belonging to your local community?

- 1) Very strong
- 2) Somewhat strong
- 3) Somewhat weak
- 4) Very weak

Thank you for filling out this survey and lending your voice to this evaluation

Virtual Classroom Teacher Evaluation Interview Guide

1. Please describe your experience using the [Insert Virtual Classroom name] program?
 - a. What components did you complete?
 - b. Did you experience any difficulties accessing materials?
 - c. Did the content meet your expectations?
 - d. Was the program easy to use?
2. How do you feel the students reacted to the program?
 - a. Did you encourage students to use the program on the computer?
 - b. Were the students receptive to the online format? The classroom format?
 - c. Did the students enjoy the program?
3. How do you feel this program and format compares with other programs looking at the same topic?
 - a. How did the program compare with others on the same topic in fostering student engagement?
4. What recommendations do you have for TakingITGlobal and Youth Voices on improving the programs?
 - a. Is there content areas you feel were not adequately addressed or areas that were overlooked?
 - b. Was the material a suitable fit for your students?
 - c. Were there issues around students with special needs that this program failed to address?
5. Would you recommend this program to your fellow teachers?
 - a. How would you rate the quality of this program?
 - b. What would be the best way to disseminate this program to others?
6. What, if any, experience did you have linking to other teachers or classrooms?
 - a. Did you use the online virtual community?
 - b. Were you interested or able to connect your classrooms to others?