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Audience-response devices ('clickers'): A discussion paper on their potential contribution to alcohol education in schools

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Abstract

Many schools endeavour to provide effective, relevant and appealing alcohol education to students, using up-to-date technologies and resources. However, choosing an appropriate, evidence-based programme or approach is rarely straightforward given the plethora of options and limited evidence base. The alcohol education literature and findings from a recent Australian study indicate four key features of effective alcohol education approaches: interactivity, peer education, exploration of students' opinions/knowledge, and addressing alcohol-related misperceptions. These four features are acknowledged strengths of audience-response devices ('clickers'). Clickers are increasingly popular, supported by growing evidence of suitability for a variety of educational applications and have untapped potential in the delivery of alcohol education. Clickers can engage and empower students and their ability to elucidate misperceptions regarding prevalence and acceptance of risky alcohol use among peers corresponds with normative education approaches. Clickers are effective, fun, create valuable 'teachable moments' and provide potential to enhance delivery of evidence-based alcohol education.

Keywords

adolescents, clickers, drug education, health promotion, interactive teaching, peer education

Introduction

There is extensive literature on school-based alcohol education.[1,2] It is not of uniform quality, and is characterized by gaps and inconsistencies. This, coupled with the wide array of available programmes, makes programme choice challenging. An imperative for schools is to utilize proven

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approaches that are relevant and appealing to students, and complemented by up-to-date resources and current technologies.

Drawing on findings from a recent Australian study on the role of schools in alcohol education,[3] this paper addresses the potential role of a relatively new technology – audience-response devices (or 'clickers') – to assist schools to deliver evidence-based alcohol education. The content, format, and delivery style of alcohol education is first considered, followed by a brief overview of 'normative' education, based on a social influence approach to alcohol education. The potential use of 'clickers' in classroom settings and their strengths and limitations is then examined.

Addressing students' beliefs about the prevalence and acceptance of alcohol use is generally more effective than just conveying scientific 'factual' information.[4–7] Effective alcohol education also entails interactivity, peer education, exploring students' opinions/knowledge, and highlighting misperceptions[8–11] and these features correspond with the key characteristics of clickers. By engaging and empowering students, and revealing misperceptions regarding the prevalence and acceptance of risky alcohol use among their peers, clickers can act as an adjunct to effective alcohol education.

Challenges for school-based alcohol education

Schools face multiple challenges in delivering effective alcohol education.[12,13] In many countries, widespread acceptance of drinking as 'normal' behaviour conflicts with efforts to increase awareness of its potential negative health and social impacts.[14] Community ambivalence towards underage drinking can compromise the ability of schools to provide alcohol education. Students, parents and others may dismiss prevention and safety messages as irrelevant or unnecessarily alarmist.[15,16]

High-quality, effective alcohol education programmes may also be hampered by various factors within and beyond the school environment. Evidence concerning effective alcohol and other drug prevention approaches for adolescents is limited. Even where evidence is robust, the translation of research into practice can be problematic.[17] Schools may be hindered by crowded curricula, limited funding, difficulties in accessing up-to-date educational resources and few opportunities for professional development.[3,12,18]

Support for evidence-based decisions

Findings from recent systematic reviews and meta-analyses[2,5,19–23] can inform the choice of alcohol education programme or approach. For instance, it is recognized that knowledge about risks associated with alcohol is insufficient of itself to change behaviour. While adolescents need to know about potential harms, information-only programmes do little to reduce consumption or harms.[2,24,25]

More intensive and interactive classroom-based educational sessions are more effective than other approaches.[3] Generic programmes (e.g. Bond et al.[26]) that address a range of risky behaviours and enhance support and student connectedness can also achieve positive results.[3] Similarly, social influence approaches that include resistance skills and normative education elements have been found to be effective.[4–7] However, not all social influence programmes are effective, and not all elements within social influence programmes contribute to behaviour change.[27] Social influence programmes may entail:

1. Information on the consequences of drug use;
2. Resistance training to counter pressure to use drugs;
3. Normative information on acceptability and prevalence of use among age peers; and
4. Broader social skills training to improve self-esteem and social competence.[27]

The third element, normative information, is relevant to the use of clickers in educational settings. Normative education seeks to address misconceptions about the prevalence of drug use (or other risk-taking behaviour) amongst peers.[28] Three related assumptions underpin this approach:

- Many young people over-estimate the extent of risk-taking behaviours amongst their peers;
- They wrongly believe these behaviours are the norm;
- Because of these misconceptions they are vulnerable to social pressure to conform to this norm.[29,30]

The normative education approach often draws on survey data collected from young people, and seeks to correct misconceptions – e.g. 'that everyone is doing it' – in order to reduce perceived social pressure to experiment with alcohol or drugs. Ideally, data should be provided by the students receiving the alcohol education[28] and should involve a detailed assessment of beliefs regarding different drug types, with strategies developed to counter these normative beliefs (see also Bruvold,[31] and White and Pitts[32]).

However, these requirements can be problematic. Teachers may have difficulty obtaining data on students' perceptions and behaviours relating to alcohol use. Beyond the logistical challenges of survey design, administration, data analysis and reporting, some students may be reluctant to provide honest responses – and thereby defeat the purpose of the exercise. Alternatively, other community or school survey data might be utilized,[25,33,34] but this would provide data on 'distal peers' rather than more relevant and influential 'proximal peers'.[35] Audience-response technology provides one option for teachers to overcome these challenges and collect anonymous data in a fast, cost-effective manner, to identify and correct misperceptions about alcohol use.

Audience-response systems (clickers)

Audience-response devices – or 'clickers', 'classroom communication systems,' 'audience-response systems', and 'real-time polling'[36,37] – were initially expensive and confined to large organizations such as IBM and the military. Gradually, marketing agencies utilized the technology for product development and media testing,[37] and they also came to be used in educational settings.

Clickers enable participants to respond to questions using a hand-held electronic keypad resembling a remote control device (distinct from simple 'clicking' devices used for counting purposes). Clickers enable efficient and fast collection of quantitative data. Each group member has their own clicker (keypad) unit. A PowerPoint-style slide presentation displays survey or discussion topic questions on a screen. The facilitator asks a survey question, displayed on a slide, and each person presses the clicker button corresponding to their answer. Responses are transmitted to the laptop computer via a radio signal, and specialized clicker software collates and graphs the results on a PowerPoint slide for immediate viewing.

Participants can instantly view aggregated group data, and/or the data may be saved for later analysis, simultaneously providing participants with anonymity and a shared experience. Students' privacy is protected as the software settings ensure that the participants, facilitator, or others present do not know how specific individuals answered. Anonymity and confidentiality are important when dealing with sensitive issues such as substance use, and real or perceived threats to these concerns can impact negatively on participation and the 'believability', or reliability, of the data.[38] Unlike traditional survey methods, aggregate results for individual questions may be viewed immediately and can serve as a focal point for discussion.

Clickers in the classroom

Clickers are flexible tools. They can be used in many subject areas (e.g. they have been used extensively in science courses in higher education settings[36]), at various academic levels, and can occupy either a peripheral or central role.[39] There is growing evidence of their effectiveness in a variety of educational applications.[40–43] Their popularity is partly explained by young peoples' affinity with technology, with today's students known as the 'thumb generation' reflecting a fondness for texting.[44]

Classroom teachers can use clickers to, *inter alia*:

1. Measure what students know before commencing a course or unit;
2. Make lessons more interactive;
3. Increase students' retention of material;
4. Make assessment and marking quicker and simpler;
5. Facilitate student–student discussion (including peer instruction);
6. Obtain a more accurate overview of the class' opinions and knowledge;
7. Find out whether students have done/understood their assigned reading;
8. Highlight (and assist students to acknowledge) common misconceptions/misperceptions.[45]

Clickers and the delivery of evidence-based alcohol education

There is a high degree of correspondence between the key elements of evidence-based alcohol education and the central features of clickers. Clickers can help increase interactivity, deliver peer education, provide an overview of students' opinions/knowledge, and highlight misperceptions about alcohol use.

Clickers can increase student *engagement*. Anecdotal evidence indicates that school-aged students often show disinterest in conventional pen-and-paper surveys. Even with initial interest, conventional data-collection methods often fail to retain students' attention for the requisite period of time.[46] When used for classroom-based research or education sessions, students have taken a keen interest in the clicker units. Clickers were used by the authors during a national Australian alcohol education school consultation process involving 36 schools (19 government schools, seven catholic schools and 10 independent) and 23 student focus groups (involving 214 participants).[3] The clickers assisted students to remain focussed on the survey and related discussion for the duration of the session. Nearly all students were willing to share their opinions, or at least comment on results of previous questions.[3] The capacity of clickers to help instigate discussion is one of their greatest assets.[9] Hancock[37, p. 4] states:

> Although discussion is an active learning strategy . . . 10–20% of the participants often dominate the conversation. Clickers help to make visible the thoughts of the majority. This diversification of opinions can open-up discussion and encourage the quieter majority to speak up.

Clickers and peer education

Clickers are also compatible with various forms of peer education[47,48] where teachers or peers pose conceptual questions that probe students' understanding of a topic and ask them to debate these issues.[45] Peer education is both popular and 'intuitively appealing' but must be carefully planned and executed (Bament, 2001, in McDonald et al.,[48] and Skinner and Roche[49]). From the teacher's

perspective, clickers offer an efficient means to monitor progress and problems in peer-learning groups and to intervene when either the class is confused or has understood the concept thoroughly and is ready to move on.[39]

'Clicker work' also has potential for integration into secondary schools' peer leadership programmes. 'Peer leaders' can receive basic training in using clickers, designing and administering their own surveys to their classmates, analyzing results, and reporting findings. Peer-led applications are being trialled by one of the authors (CH) and, to date, they have been well received by students and teachers alike. However, further research is needed to identify ways in which 'clicker work' can encompass the features of effective alcohol education and be incorporated into a peer-education framework.

Providing an overview of students' opinions/knowledge

Clickers allow students to give anonymous responses that are free from peer pressure/group effects.[44] Each student can express their preferred choice, rather than explaining and justifying their choice to others.[9] This is particularly advantageous when dealing with sensitive issues.

Clicker sessions also enable teachers to 'hear' from students who may not otherwise 'speak up' in a group discussion. Teachers can gain new insight into students' thinking and levels of understanding by circulating through the classroom during student discussion.

Another benefit of clickers is their ability to highlight diversity of opinion. Clickers can help deal with more confident class members dominating discussion, and thereby creating a false impression of unanimously-held opinions or ideas. The use of clickers may also mitigate social desirability response bias (i.e. where students answer according to how they think the teacher or peers might want them to answer), as well as image management and group-status processes.

Revealing students' misperceptions

Another strength of clickers is their ability to reveal and correct misperceptions about alcohol and other social issues. This has been developed and trialled extensively by La Brie and colleagues,[50] who also coined the phrase BLING ('Brief-Live-Interactive-Normative-Groups').[51]

Clickers are well suited to identifying misperceptions among specific student groups. For example, 'paired' questions can be asked where students' own use/attitude is followed immediately by a 'perceived use' attitude question. The pairing of items is central to the normative approach, as is facilitating honest responses and anonymity. To minimize the extent to which answers may be influenced by one's peers, software settings may be adjusted so as not to display results from the 'own use/attitude' questions until after the 'perceived use/attitude' answers have been collected.

Evidence supporting the use of clickers to correct misperceptions about alcohol is growing.[52] La Brie and colleagues found clicker-based sessions effective in correcting normative misperceptions regardless of gender or magnitude of initial misperception. They concluded that the data 'further validate the ability of live normative group-specific data-collection and feedback to overcome saliency and credibility issues exhibited by many existing social norms interventions'.[50, p. 1094]

Disadvantages and advantages and of clicker-based health education

Audience-response technology is not without disadvantages and limitations. Like any tool, clickers require training and practice to achieve proficiency. The skill of the session leader (as a clicker operator, educator and/or facilitator of discussion and group dynamics) contributes to the

success of the sessions. Cost is another consideration. A set of 40 clickers and accompanying software costs several thousand dollars. However, compared to conventional paper-based surveys, clickers are competitive. To off-set the cost, schools in a geographical area could jointly purchase a set to be shared.

In our experience as educators and researchers, the advantages of clickers outweigh their disadvantages. Many clicker models have compatible software with mainstream programs (such as PowerPoint and Excel), and they provide a new and innovative mechanism for involving high-school aged students in discussions that address students' views about alcohol, drugs or sexuality. Overall, 'clickers' present exciting opportunities for teachers and others involved in designing, delivering and/or evaluating school-based alcohol and other drug education or health promotion programmes.[53]

Conclusion

The potential role for audience-response devices to assist secondary schools to deliver evidence-based alcohol education is growing. The social influence approach (including normative education) as a model is well supported by the evidence and involves four essential features of effective alcohol education approaches: interactivity; peer education; obtaining students' opinions/knowledge; and highlighting misperceptions. These four key features can be enhanced through the use of clickers in educational settings.

While audience-response systems 'are intrinsically neither good nor bad; they can be used skillfully or clumsily, creatively or destructively, and they can produce results that are potentially of great value to both students and instructors for enhancing the teaching-learning process'.[54, p. 796] As such, the technology holds considerable promise for engaging adolescents in research projects, school-based health education, and other curriculum/school activities and programmes. Although there is an element of novelty associated with their use, the potential benefits are substantial, and warrant further evaluation and consideration. In sum, clickers are simple, effective, fun, and create 'teachable moments' that facilitate student exploration and sharing of ideas, facts and experiences.

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