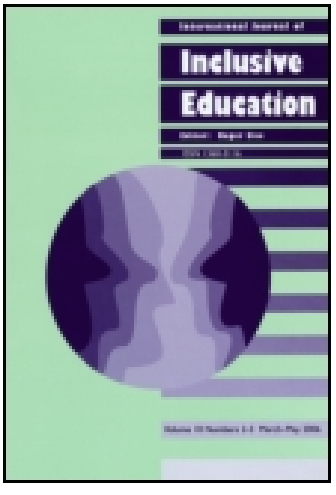

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Serious games for learning: games-based child sexual abuse prevention in schools

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Serious games for learning: games-based child sexual abuse prevention in schools

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In spite of research demonstrating conceptual weakness in many child sexual abuse (CSA) prevention programmes and outdated modes of delivery, students continue to participate in a diversity of initiatives. Referring to the development of a games-based approach to CSA prevention in Australia, this paper examines empirically based attributes of effective CSA prevention programmes for schools including contemporary pedagogies for learning. The paper draws on findings to inform the conceptual development phase of Orbit, an online, free and equal-access, games-based educational approach to CSA prevention for children aged 8–10 years. First, the paper provides a review of CSA prevention in schools and games-based approaches to key learnings in prevention. Second, an overview of Orbit (the Feeling Safe sexual abuse prevention project) is provided. Finally, implications for the development of games-based prevention programmes are offered and an argument is made for the advancement of games-based prevention resources.

Keywords: games-based learning; contemporary pedagogy; child protection; school programmes; child abuse prevention

Background

Child abuse and neglect is a global issue recognised internationally as a matter of great sociological concern (ISPCAN 2011; UNICEF 2012). As part of national and international agendas, the need for child sexual abuse (CSA) prevention has been advocated widely (Briggs 2005; Renk et al. 2002; UNICEF 2012; Wurtele 2009). While recognised as a concern, the magnitude of CSA is difficult to ascertain. The incidence, however, within western nations such as Australia and the USA is considered a serious social problem (AIHW 2010; USDHHS 2005). Within the Australian context alone there have been approximately 3500 recorded incidences each year for the past five years (AIHW 2010). The incidence of CSA is believed to be higher as many cases are not formally reported or alternatively are not investigated by government authorities (Fallon et al. 2010; Mathews 2011). Research indicates some students are more at risk of sexual abuse as a consequence of their age, gender, disabilities or parental dysfunction (Putnam 2003). For students who become victims of abuse the consequences can be significantly harmful with a range of psychological difficulties found to be more prevalent (Paolucci, Genuis, and Violato 2001; Putnam 2003; Tyler 2002). These negative outcomes have far-reaching affects and may contribute

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to creating pedagogical challenges for teachers when teaching students demonstrating associated academic, behavioural or social problems (Daignaut and Herbet 2009; Veltman and Browne 2001).

In response to increasing evidence of CSA and concern for the consequences for individuals, many prevention programmes were developed in the late 1970's and widely disseminated in the early to mid-1980's (Wurtele 2009). Interest in the prevention of CSA culminated in a diversity of initiatives with little consistency in content, delivery or duration (Finkelhor 2009; Sanderson 2004; Tomison and Poole 2000). Of concern is the independent development of diverse programmes that are not evidence based or supported by ongoing evaluation (Finkelhor 2009; Sanderson 2004; Tomison and Poole 2000). Initially the focus of CSA prevention efforts was to alter the knowledge and skills of children through group-based instruction on personal safety, usually conducted in educational settings (Wurtele 2009). School systems provided an avenue to disseminate key messages with programmes potentially reaching large numbers of children from diverse racial, ethnic and socioeconomic groups (Wurtele 2009).

Today there is a wide range of prevention programmes that typically vary in their content, key messages, duration and skills developed (Sanderson 2004; Tomison and Poole 2000). Despite the large number of CSA prevention programmes already in use, many organisations appear to be independently developing very similar programmes often duplicating what already exists (Sanderson 2004; Tomison 2000). While critics are concerned about the diversity and content of programmes, the possible benefits of children participating in some type of self-protection programmes are significant. As key researchers have suggested, prevention programmes have the potential to facilitate substantial gains in knowledge and skills that may result in avoiding sexual victimisation (Kenny 2009; Wurtele and Owens 1997).

Current CSA prevention programmes

Many current CSA programmes have been reported to have conceptual weaknesses (Sanderson 2004). For example, there are programmes that either fail to deal with the issue of abuse by a familiar adult or overemphasise the risk posed by strangers (Kaufman and Zigler 1992). Molestation by strangers is considered relatively infrequent, with strangers believed to be responsible for only 10–20% of reported child sexual assaults (McCurdy and Daro 1994). With an estimated 90% of perpetrators of child sexual assault known to the victims (Trewin 2005) the concept of stranger danger is considered inappropriate for this type of abuse as it does not help prevent CSA when the perpetrator is know to the child (NCMEC 1999; Trewin 2005).

Also of concern are programmes that present abusive situations as involving a sudden attack by a perpetrator (Bagley, Thurston, and Tutty 1996; Conte, Wolf, and Smith 1989). This notion is unhelpful as sexual abuse more frequently involves a grooming process taking place over a prolonged period (Smallbone and Wortley 2001) and programmes typically do not teach children the skills to resist grooming. Significantly perpetrators often use their authority to sexually exploit children and children can find it difficult to resist the authority of an adult (Bogat and McGrath 1993; Pelcovitz et al. 1992). Furthermore, some programmes do not always acknowledge that sexual abuse may not involve touch (e.g. exposure to pornography, taking naked photographs, sexualised language) or that 'bad' touch may actually feel good (Whetsell-Mitchell 1995). They also fail to acknowledge the possibility that at times the abuse may

induce physical responses that are interpreted as pleasant, causing confusion and shame (Briggs 2007). These responses can then increase the victims' guilt about their experiences, thereby encouraging children to feel responsible for their abuse (Briggs 2007).

In addition, some programme content is designed primarily to meet the protection needs of girls, and may not provide adequate prevention training for boys (Bagley, Thurston, and Tutty 1996; Briggs 2005). Boys require specific consideration as they tend to perceive a lower likelihood of being sexually abused (Briggs 2007) and can be less enthusiastic about protection programmes (Finkelhor and Dziuba-Leatherman 1995). Boys have also been found to be less willing to disclose sexual abuse (DeVoe and Faller 1999) and to rate programmes less highly than girls, believing they are less helpful, less interesting and less likely to contain any new information (Finkelhor and Dziuba-Leatherman 1995). Boys also deal with issues associated with gender stereotypes that include males being viewed as the instigator of CSA rather than the victim and beliefs that sexual experiences with older women is not abusive (Coxell et al. 1999; Stoltenborgh et al. 2011). These beliefs influence disclosure due to fear of peer homophobia, confusion about sexuality and the fact that victimisation is the antithesis of boys' personal identity as a male (Briggs 2005; Dziuba-Leatherman and Finkelhor 1994; Romano and De Luca 2001).

Although there are conceptual concerns related to many current CSA prevention programmes, a well-designed prevention programme can be effective in teaching children child protection skills (Kenny 2009; MacIntyre and Carr 2000; Sanderson 2004; Wurtele 2002; Wurtele and Owens 1997). According to a review by Sanderson (2004), effective programmes involve children in explicit training in preventive behaviours and disclosure; involve group training using standardised materials, content and administration; have programmes taught by trained instructors; can be of longer duration, involving repeated presentations; can be incorporated into the school curriculum; and involve a multisystemic approach, which targets children, parents and teachers. Repetition of concepts in additional sessions has also been advocated and reported to add significantly to learning (NCMEC 1999; Tutty 2000).

Presentation of CSA prevention programmes can also vary with effective programmes involving active student participation and engagement so participants can practice the intended behaviour or skill (NCMEC 1999). Progressively developing key learnings and skills within a fun and engaging environment, however, presents some challenges. A games-based approach to CSA prevention has the potential to provide such an environment. A games-based approach also responds to broader policy discourses that position schools as central in developing digital literacy within the Australian context, encouraging teachers to make Information Communication Technology integral to student learning (see for example Australian Government 2010; Brand 2012; DEECD 2011). The possibilities associated with a games-based approach also include addressing social justice issues as the programme expands to include marginalised children (through isolation or disability), children of both genders, teachers and parents. As students in regional and remote areas may be at greater risk of sexual abuse than children in other areas (Neame and Heenan 2004), an online game has the added benefit of providing equal access to all.

A games-based approach to learning CSA prevention skills

Internationally, there are many initiatives encouraging the use of digital games in learning (DEECD 2011; Haas 2008; Johnson et al. 2011; Learning and Teaching Scotland

2010). Increasingly, games are considered a powerful and exciting medium for engagement and learning while also facilitating increased opportunities for equity of access (DEECD 2011; Gee 2003, 2008; Ito et al. 2009; Jenkins et al. 2006; Klopfer, Osterwil, and Salen 2009). Within the Australian context the recent Innovating with Technology Research Trials focused on games-based learning to investigate the extent and nature of the impact of games-based learning on teacher practice and student learning (DEECD 2011). Many examples of the positive impact of games-based learning on students learning were identified including increases in student motivation, confidence, effort, involvement in their learning and willingness to take risks in their own learning (DEECD 2011). Findings from this Australian project reinforce prediction in the 2011 Horizon Report: K-12 Edition, which claims that games-based learning is one of the emerging technologies most likely to be adopted in the coming years as a means for empowering student in their learning (Johnson et al. 2011). Indeed, it has been argued that introducing video games into the classroom encourages and facilitates improvement in engagement, cognitive development, higher-order thinking, literacy learning, problem-solving, decision-making, multitasking and collaboration (DEECD 2011; Futurelab 2009; Gee 2008; Klopfer, Osterweil, and Salen 2009).

Recognition of the potential of games-based learning has encouraged the application of serious games within educational contexts, which involve learning the sorts of domains, skills or content associated with school and health (Gee 2008). An inclusive and useful way of describing game-based learning in schools is the use of games as resources to support the educational aims, objectives and planned outcomes of teachers who understand that games are an important medium in contemporary culture and young people's experiences (DEECD 2011; Futurelab 2009). Games have the potential to provide ideal learning environments as they facilitate problem-solving spaces that use continual learning pathways to mastery through entertainment and pleasure (Gee 2008). One of the many benefits of digital games is the facilitation of opportunities to 'learn through doing' (Kirriemuir and McFarlane 2004). Significantly, gaming has been viewed as intensely pro-social in ways that normal classroom routines are often not. The social element provides opportunities to enhance relationships between students, as well as between students and their teachers (Futurelab 2009). The potential of computer games to support the development of relationships within the school setting has been identified by teachers as perhaps the most valuable outcome of game-based educational activity (Futurelab 2009). As relationship building is an important factor for CSA prevention a games-based approach has the potential to strengthen healthy relationships with peers and teachers.

Custom-built computer games also have the potential to develop broader relationships and learning opportunities as game play is extended into the home to involve trusted adults or parents. This is a significant consideration for CSA prevention programmes when positive relationship building is considered a critical component to child protection. It is important that CSA prevention programmes actively involve children, parents, teachers, officials, key organisations and the wider community (NCMEC 1999). Best practice includes facilitating conversations around CSA and encouraging strong support networks between friends and trusted adults to remove secrecy, resources that encourage looking after each other and closer school, teacher, parent, child relationships. Gee (2008), Jenkins et al. (2006), Prensky (2005 2007) and Ito et al. (2008) argue that there is an increasingly important role for games in learning. Moreover, while traditionally believed to be dominated by boys and young men, the video games market is changing with girls and women entering the playground of

games (Brand 2003). In fact, new media forms have altered how students socialise and learn, and raise a new set of issues that educators, parents and policy-makers need to consider when conceptualising learning (Ito et al. 2008). When digital games are well designed they provide learning paradigms that evoke a sense of pleasure for the player where the player wants to learn to achieve mastery (Gee 2008). Qualities that facilitate productive learning include: players learning by experience and receiving immediate feedback with opportunities to try again; opportunities for players scaffolding; opportunities to learn from the experiences of other players and opportunities to learn about 'ways of being in the world' (Gee 2008). They also include richly designed spaces to help the player solve a problem, model environments, behaviours and concepts that allow the player to be led from concreteness to the abstract (Gee 2008).

The prevalence of gaming and PC's in homes also encourages a games-based approach to learning about CSA. In 2011, The Centre for New Media Research at Bond University and Interactive Games and Entertainment Association of Australia (iGEA) commissioned a national survey to provide data on the importance of games in Australia (Brand 2012). A random sample of 3533 woman, men, girls and boys who represented their households responded to more than 80 questions in an online survey. The data were published as the *Digital Australia 2012* (Brand 2012). According to the report, 99% of Australian households owned a PC and 94% of children aged between 6 and 15 played digital games (Brand 2012). Of note, digital games are no longer a solitary activity as 70% of those surveyed indicated that they played digital games with others either in the same room or over the Internet (Brand 2012).

In this paper, we argue that a games-based approach to CSA prevention provides a powerful medium for learning, including opportunities for using standardised materials and content, repeated over time within school curriculums. Additional benefits include opportunities for offering online games that are free and provide equal access, while fostering a fun and engaging educational approach to CSA prevention for children. To this end, the team worked on the Feeling Safe project to develop an online games-based CSA resource called Orbit. This paper draws on the broader Feeling Safe project and presents preliminary findings concerning best practice in CSA prevention.

The research context

The Feeling Safe, Child Sexual Abuse prevention project was funded by the Queensland Police Service (QPS), Daniel Morcombe Foundation (DMF) and the Telstra Foundation in response to CSA in Australia. This issue was brought to public attention with the disappearance and murder of Daniel Morcombe in 2003, and more recently with international child pornography investigations. The Feeling Safe project has developed and piloted an integrated resource around the education of children aged 8–10, parents and the wider community concerning issues of sexual abuse. The project aims to result in a long-term reduction in the incidence of CSA by increasing children's awareness of situations that might impact upon their personal safety and empowering them with the ability to act, while cultivating stronger community knowledge and support for and about CSA prevention.

The project is being developed in Queensland, Australia, and involves a collaboration between the QPS, the DMF, the Telstra Foundation, the Department of Child Safety (DCS), Sunshine Cooloola Services Against Sexual Violence Inc (SCSASV)/ Laurel House and the University of the Sunshine Coast. The team also works with

the Education Queensland (EQ) to embed the Feeling Safe game, Orbit, in schools nationwide and to maximise access for those children isolated both socially and geographically from sexual abuse prevention education and support.

The Feeling Safe project responds to the research question: What are the theoretically coherent and empirically evidenced attributes of effective CSA prevention programmes for schools? From a constructivist theoretical framework (Jonassen, Peck, and Wilson 1999; Perkins and Jones 2004; Schunk 2008) the project develops and builds an evidence-based, online child protection resource which engages students in learning by playing the Orbit computer game. As far as the project team is aware this is the first online child protection resource of this nature to be developed. The Orbit game focuses on progressively developing key learnings and skills and builds on prior knowledge. It does not rely on rules-based rote learning. Instead, it encourages the development of relationships, trust, well-being, self-worth, esteem and confidence and builds support networks and community knowledge and responsibility. Furthermore, the game is being built in collaboration with counsellors, social workers, psychologists and educationalists with key positive and practical learnings for both children and their carers.

The research process

A systematic review of international education and training programmes for CSA prevention in schools was conducted to identify best practice in CSA prevention and appropriate key messages suitable for children. To minimise bias, protocols were developed with criteria for a 'systematic review' (MacDonald 2000). Following Evans and Benefield (2001) framework, clear and explicit steps were taken in a systematic search to address the general research question.

First, multi-disciplinary teams conducted reviews to produce research-based reports on CSA prevention and examine issues associated with age, gender, computer games and pedagogy, delivery and disclosures, key messages and teacher training requirements. Second, the game content and project framework was mapped to the available research and practice knowledge in CSA prevention education. Third, pilot tests of Orbit were conducted and an evaluation strategy and evaluation instruments developed. The evaluation process involved playtests in classrooms and formal trials in selected schools. Orbit has received ethical approval for each stage of its development, play testing and formal school trials in Queensland, Australia. Ethical approval has been granted by the University Human Research Ethics committee, the Queensland Department of Education and Training Human Research Ethics Committee and the Brisbane Catholic Education Human Research Ethics Committee.

The Orbit game, lesson plans and website information have been developed in collaboration with social workers, counsellors, psychologists, education researchers, teachers, parents and students. The programme is aligned with the Queensland curriculum and comprehensive lesson plans are provided to assist teachers to use the resources effectively. Teachers can access a dedicated section of the Orbit website which contains additional resources, classroom activities, information about CSA and prevention, and training materials to assist teachers to use Orbit. Teachers can adopt the resources or use without modification, and are also encouraged to extend the lessons and use the website to share these new resources with others. Orbit also recommends and outlines ways that teachers can work with existing relevant support within the schools such as student counsellors and welfare staff to deliver the CSA

prevention programme. The Orbit website provides practical procedures to assist school staff to appropriately respond to a CSA disclosure, including mandatory reporting requirements and ways to ensure that the child's well-being is safeguarded.

The project is evaluated with children, teachers, parents/carers and the wider community. The evaluation tools were selected based on international standardised psychological instruments. The Orbit online game is evaluated in multiple school settings to access the short-, mid- and longer-term retention by children of sexual abuse awareness and prevention skills. Retention of knowledge needs to be measured beyond 3–12 months (Zwi et al. 2008), together with any changes in child self-esteem and confidence, and any misunderstanding of skills or cause of child anxiety. The programme will be improved iteratively and continuously to minimise any potential negative risk to child confidence and behaviour. The Feeling Safe project is a complex interdisciplinary initiative which has been conceptualised, developed and trialed over several years. This paper reports the initial findings that emerged during the conceptual and development phase.

Findings

Part 1: attributes of effective CSA school prevention programmes

The conceptual process involved the Feeling Safe team researching and compiling qualities of effective prevention programmes and best practice messages from organisations such as Yello Dyno Inc. (2012), Kids Help Line (2012), Coalition for Children (2012) and evaluated school-based personal safety skills programmes such as Stay Safe (MacIntyre and Carr 2000) and Keeping Ourselves Safe (Briggs and Hawkins 1994), together with information, practical experience and practitioner advice from the QPS, DMF, DCS, SCSASV/Laurel House and other State-based child protection departments and EQ. The review found that specific elements of prevention programmes are associated with student learning. For child safety prevention programmes taught in schools, these successful initiatives include a coherent theoretical basis, active participation, specific skills training, multiple programme components including parental involvement, individualised instruction and lower teacher to child ratios, with full programme implementation repeated many times during the school year (Davis and Gidycz 2000; Luna and Finkelhor 1998; NCMEC 1999; Sanderson 2004; Wurtele 1998). Findings indicated that prevention programme features associated with child learning and retention of sexual abuse messages and skills include (Sanderson 2004):

(1) Active participation. Programmes that encourage active participation of children (e.g. through role-play) are more effective than those that use either passive methods (e.g. traditional teaching and discussions) or no participation (e.g. videos, written materials and self-study) (Davis and Gidycz 2000).
(2) Explicit training. Allowing children to rehearse appropriate behaviours is associated with greater gains in skills and knowledge over non-behaviour techniques (e.g. lectures, videos and puppet shows) (Rispens, Aleman, and Goudena 1997). Without behavioural rehearsal, any transfer of knowledge to behaviour in a potential abusive situation is unlikely (Melton and Flood 1994). The behaviour rehearsal should also include practicing disclosure and sufficient information for a child to understand, plan and implement reporting of abuse (Reppucci and Haugaard 1989).

(3) Standardised materials. Programmes are more effective if they involve standardised materials and are taught by trained instructors (MacIntyre and Carr 2000).
(4) Integrated into schools curriculum. Programmes are more effective if they are integrated into the school curriculum with designated times for delivery and support (Berrick and Barth 1992; McCurdy and Daro 1994).
(5) Longer programmes. Longer programmes involving repeated presentations and followed by summaries to reinforce training are more effective than shorter programmes (Davis and Gidycz 2000; MacIntyre and Carr 2000; Wurtele 1998).
(6) Parental involvement. Children benefit more from prevention training if their parents are also included in the programme (Wurtele 1998).
(7) Teacher education. Programmes that include teacher education to achieve combined teacher, parent and child education are more effective in helping children to retain their prevention training (MacIntyre and Carr 2000).

Table 1 provides an overview of identified qualities of effective prevention programmes and a games-based approach to address these qualities.

Findings indicated that best practice and effective prevention also includes appropriate key messages and content. While acknowledging there is no single approach to victimisation prevention (Asdigian and Finkelhor 1995; Finkelhor and Dziuba-Leatherman 1995), the development of core key messages provides baseline content that can be tailored to suit diverse cohorts of children accounting for factors such as age, gender, vulnerability and geographic location. Based on research by Wurtele (2002) and the review of CSA prevention programmes an overview of key messages was compiled. The Feeling Safe development team also identified a number of problematic areas that typically occur in CSA prevention programmes. Some of these areas are problematic because children find it difficult to assimilate what they are learning in a CSA prevention programme with what they already know about the world. Table 2 provides an overview of key messages and problems identified.

Key messages in a CSA prevention programme should be aligned to the participant characteristics and diversity (e.g. gender and age). The key messages should be reinforced, repeated over time and, if applicable, expanded. In addition, content should be taught using a variety of learning modalities including knowledge building, simulations, active behaviour skills training (Davis and Gidycz 2000) and participant modelling of skills (MacIntyre and Carr 2000; Wurtele 2002). It is acknowledged that particular knowledge concepts, confidence in managing feelings and developing resistance skills may be challenging for children. Programmes need to address such challenges. Of note, studies have found that the involvement of multiple stakeholders, including children, teachers and parents, is essential for positive outcomes (MacIntyre and Carr 2000; Wurtele 2002).

Part 2: games-based approach to CSA prevention

The Feeling Safe team comprising social workers, psychologists, educationalists and technology developers worked with our partners to identify strategies to engage children aged 8–10 in CSA prevention. Our review found that a games-based programme should be deployed primarily on PC platforms and as a free-to-use online resource with download accessible in schools and within the home. School students have regular and increasing access to a PC at school and within their home (Brand 2012; DEECD 2011; ESA 2012; Johnson et al. 2011). Ito and Bittanti (2009) recently found that more than

Table 1. Qualities of effective prevention programmes.

(1) Active participation	Good games intrinsically motivate players and active participation is required to progress. Some common motivations for playing games include immersion, excitement, reward and challenge. These combine to build an emotional connection between the player and the game; the player has a sense of agency; they feel that their decisions matter and make a difference to the game world. Players may also develop empathy for the game characters The Orbit game aims to inspire this enthusiastic participation by using an adventure genre of game that is popular with both genders in its target population of 8–10 years (Brand, Borchard, and Holmes 2008). An adventure game is a playable story, and in the Orbit adventure game, the player creates an avatar in their own likeness. The game takes place on a spaceship and throughout the game, the player 'beams' aboard trusted adults from their real life
(2) Explicit training	Although games give the player a sense of agency, games are also a controlled environment. A game can guide the player's experience while maintaining their sense of agency and their immersion in the game environment. Therefore, games can provide explicit training through game experiences, consequences of in-game actions, game tutorials and just-in-time training. In addition, the influence of the game can bleed into the real world through guided discussions and other related learning activities. Thus, explicit training can be effectively conducted both in the game and out of the game. Furthermore, as the player already knows and cares about the game, games can be effective stimuli for out-of-game learning
(3) Standardised materials	The controlled environment of computer games allows materials to be standardised. In addition, they offer immediate feedback and can assess how players are mastering key learnings and offer the opportunity for them to try again if necessary. In addition, learning game designers may also provide standardised accompanying materials such as lesson plans and discussion guides to accompany the game. The Orbit game features a linear story and accompanying mini-games. Although children can customise their interaction with the game, all children will ultimately experience the same game content and at their own pace. Standardised teacher training materials, lesson plans and discussion guides are also provided
(4) Integrated into schools curriculum	Learning games are increasingly providing flexible models for integration into school curriculum, for example, 'Gamestar Mechanic' (E-Line Media 2012) and 'Lure of the Labyrinth' (BrainPop 2012). The Orbit game provides teachers with suggested lesson plans for use with the game as well as optional activities. These lesson plans and optional activities map to the elements of the Australian National Curriculum (ACARA 2012). The Orbit game also provides an online community for teachers to share examples of game integration with their curriculum and to exchange teacher-developed resources and activities
(5) Longer programmes	The Orbit game and associated accompanying activities are designed to be conducted over a number of weeks. The game is

(*Continued*)

Table 1. Continued.

	divided into five chapters, and for classroom delivery it is expected that each chapter and associated companion lessons be conducted over a one- or two-week period. Orbit has been designed to allow repeated play, by challenging children to complete optional levels, unlock rewards and achieve high scores
(6) Parental involvement	Learning games are increasingly providing information for parents (see for example 'Lure of the Labyrinth' (BrainPop 2012) and 'Mathletics' (3P Learning 2012)) both via their website and information packs. Similarly, Orbit has a comprehennsive website and introduction pack for parents but importantly also allows parents and other trusted adults to log into the game, to experience the learning first hand, to track their child's progress so that they can provide meaningful support and to leave encouraging messages for their child
(7) Teacher education	Learning games for schools should also provide training for teachers (see for examples 'Lure of the Labyrinth' (BrainPop 2012), 'Gamestar Mechanic' (E-Line Media 2012)). This training should ensure that teachers and children gain most from the use of the game in the classroom and enable teachers to manage issues arising from using the game in the classroom The Orbit website provides teacher training including more information about CSA and what to do if a child discloses sexual abuse. In addition, teachers are encouraged to play the game themselves and are given special online tools and access to play the game with their class, highlight key moments in the game, and manage and monitor their class' progress

two-thirds of the children they interviewed in the USA had game consoles in their home before the age of 10. Data collected as part of Interactive EAA's 2011 survey of Australian computer game activities in the home found that of 1252 households 99% had a PC (EAA 2012). Moreover, 83% of parents of children aged 18 and under and living with them play computer games. Of parent who play, 88% play with their children, an increase from 70% in 2008 (EAA 2012).

Serious games

With a PC games-based approach identified as providing an accessible and appropriate learning paradigm, a comprehensive framework for building a serious game for CSA prevention was required. The Feeling Safe project considers that CSA prevention is fundamental to enhancing students' well-being. The development of a games-based approach is, therefore, considered a serious game contributing to positive health. Serious gaming for health is an emerging field that complements engaging learning environments with great artwork, great content, great game play, great feedback, great sound, great hook and so on (Csikszentmihalyi 1998; Lazurus 2012). Serious games have the additional challenge over 'non-serious' commercial games to include learning opportunities as integral to the game play and story. Therefore, game conceptualisation must include meticulous planning of each element of the game and integrating all elements so that flow is retained (Csikszentmihalyi 1998). The aim is to have

Table 2. CSA prevention key messages.

Domain	Key messages
(1) Clarifies and describes	Clarifies and explains sexual abuse in a clear and direct manner. Assists in clarifying between 'right' and 'wrong', 'normal' and 'abnormal' behaviours. Distinguishes appropriate and inappropriate touching, including positive and negative feelings about touching • Children can identify touching and non-touching forms of abuse Includes identification of private parts and correct anatomical terms, including body ownership • Children can describe private and public parts of the body Describes possible offenders (examples including authority figures, family members, known adults, strangers and older children) • Children know that sexual abuse offenders can be anyone Describes potential victims (examples of both males and females, all races, ages, sizes and includes children with disability) • Children know that sexual abuse can happen to anyone *Identified problem: some CSA prevention programmes do not acknowledge that sexual abuse may not involve touch at all (e.g. exposure to pornography, exhibitionism)* (*Sanderson 2004*) *Indentified problem: some CSA prevention programmes do not teach that sexual abuse may involve a familiar adult (family) and older children (Kaufman and Zigler 1992; Sanderson 2004*)
(2) Grooming	Distinguishes between early grooming behaviours, including ways of establishing emotional ties and developing relationship, and later perpetrator behaviours including tricks and bribes (gifts and rides), and threats and blackmail • Children are aware of some techniques offenders may use *Identified problem:* sexual abuse more frequently involves a grooming process, taking place over a prolonged period (Smallbone and Wortley, 2001). Programmes typically do not teach children the skills to resist grooming (Sanderson 2004) *Identified problem: seeing abuse as a sudden attack by a perpetrator. Some CSA prevention programmes present abusive situations as involving a sudden attack by a perpetrator* (*Bagley, Thurston, and Tutty 1996; Conte, Wolfe, and Smith 1989; Sanderson 2004*). *They either fail to deal with the issue of abuse by a familiar adult or overemphasise the risk posed by strangers* (*Kaufman and Zigler 1992*). *Molestation by strangers is relatively infrequent, with strangers believed to be responsible for only 10–20% of reported child sexual assaults* (*McCurdy and Daro, 1994*)

(3) Secrets	Considers good and bad secrets • Children know that bad secrets need not be kept *Identified problem: boys in particular have been found to attribute abuse as their fault and are reluctant to report (*Briggs 2005*). Additionally, boys have a tendency to keep abuse secret whether asked to do so or not and these issues are not traditionally addressed in CSA programmes* (*Briggs and McVeity 2000*)
(4) Feelings (do not teach children to use feelings as indicators of CSA)	Not to rely on good or bad feelings • Children know what sexual abuse is and do not rely on feelings to determine whether something is right or wrong *Identified problem: often CSA programmes teach children to trust their feelings as indication that something is not right. These feelings can include butterflies in the stomach and sweaty palms. However, many CSA prevention programmes do not acknowledge 'bad' touch may actually feel good* (*Whetsell-Mitchell 1995*). *Failure to acknowledge the possibility of pleasurable responses may increase victims' guilt and shame about their experiences, thereby encouraging children to feel responsible for their abuse* (*Sanderson 2004*)
(5) Strategies and skills	Develops self-protective strategies and skills • Children develop a support network of trusted adults • Children ask trusted adults to be part of their support network • Children and adults have opportunities to build their rapport through communicating • Children have a healthy self-concept • Children understand safe body rules • Confident could stop and report unsafe behaviour • Aware can reject inappropriate and unwanted touching • Children know what to do if they experience sexual abuse • Children appreciate individuality and differences, and respect of self and others *Identified problem: an understanding of inappropriate use of adult authority. Some CSA prevention programmes do not explain the appropriate use of adult authority. Perpetrators often use their authority to sexually exploit children* (*Bogat and McGrath 1993*) *because children find it difficult to resist the authority of an adult* (*Pelcovitz et al. 1992*)

(*Continued*)

Table 2. Continued.

Domain	Key messages
(6) Disclosure	Supports, promotes and practices disclosure • Children know how to select their support network of trusted adults • Children know to keep telling their support network of trusted adults until something is done • Children practice skills training to enhance confidence and knowledge of ways to disclose • Children have confidence in trusted adults to help • Children recognise that teachers can help children to stay safe *Identified problem: an important step in any CSA programme is facilitating safe disclosure. Children need to be able to identify responsible/safe adults in order for safe and effective disclosure to occur* (*MacIntyre and Carr 1999*). *Disclosures are often fraught with difficulties especially for disabled children and many programmes do not specifically address the disclosure process* (*Briggs and McVeity 2000*)
7. No fault	*Emphasise that abuse is not acceptable and never the fault of the child* • Children know that sexual abuse is illegal and never their fault • Children understand, value and act according to their self-worth *Identified problem: long-term psychological harm of CSA includes post-traumatic stress disorder, guilt and self-blame* (*Gaskill and Perry 2011*). *Boys especially are often made to feel that abuse was their fault* (*Briggs 2005*). *To address guilt and self-blame prevention programmes should include additional material designed to improve children's self-esteem as children with low self-esteem are more likely to suffer sexual victimisation and believe it is their fault* (*Daro and Salmon-Cox 1994; Krivacska 1990; Sanderson 2004*)

students engage with and return to the game to play again. In educational games, learning can be improved and retention of knowledge enhanced through repeat presentation of the content. However, players are only going to play again if the game has a 'hook' (replayability) (Lazurus 2012). Csikszentmihalyi (1998) articulates how a hook is needed to grab the player, keep them playing and have them asking for more. The Feeling Safe conceptual phase delivered design considerations for the development of an online CSA prevention resource. These considerations are detailed in Table 3.

Computer game CSA prevention is best supported in combination with activities beyond the computer game to supplement the learning from the computer game, to further promote the messages and relate the game-play back to real-life contexts. These additional activities should be under the guidance of a teacher or caregiver. In this way game-play is extended through additional activities into real life (Klopfer, Osterwil, and Salen 2009). An extended culture around the computer game can be purposefully constructed and then users are encouraged to contribute to this culture. This can include companion websites and fan sites to the game, and player as producer by providing the ability to create artefacts around the game and share them with others via a moderated website. This can also include giving access to images within the game for use in other mediums (e.g. creating game-related posters, t-shirts, etc.), adding machinima tools to the game that allows children to easily make videos from game footage. Teacher lesson plans and guidelines for teachers, parents and trusted adults will also help students relate the game-play to real-life learnings and reinforce game messages.

Discussion/conclusion

Findings presented in this paper suggest that further investigation is warranted concerning the role of serious games for learning CSA prevention skills and strategies. It is important to note that while mobilising gaming for learning and well-being is in its infancy, new media have important implications for how young people engage in activities that they see as serious or productive work (Ito and Bittanti 2009). Significantly, today's children learn through play, and the skills they develop will apply to more serious tasks later in life (Jenkins et al. 2006). It is argued that these new participatory cultures, including gaming, represent ideal learning environments (Gee 2003; Ito et al. 2009; Jenkins et al. 2006).

Our research suggests a well-designed prevention programme can be effective in developing sexual abuse prevention skills (Kenny 2009; MacIntyre and Carr 2000; Sanderson 2004; Wurtele 2002; Wurtele and Owens 1997) and attributes of serious games can overcome many of the challenges identified in facilitating effective CSA prevention. Best practice and effective prevention includes the development of core key messages and a games-based approach to provide consistent dissemination within diverse contexts. Furthermore, working within a gaming paradigm allows child safety prevention programmes to include active participation, specific skills training, multiple programme components (including parental involvement and support from other trusted adults), individualised instruction, lower teacher to child ratios and a comprehensive implementation embedded within the school curriculum throughout the year (Davis and Gidycz 2000). Evidence indicates the interdependence of game-play and content in the development of games for CSA prevention. Building a game for learning child safety and well-being requires a series of protocols and processes to provide a comprehensive framework to guide development. In this paper, we have presented an overview of evidence-based qualities of child safety prevention programmes

Table 3. Key considerations for games-based approach to CSA prevention.

	Key consideration	How addressed in Orbit
1	Not causing harm to the player group. CSA is a confronting and troubling issue even for adults. It is a significant challenge to make an effective game that addresses these sensitive issues while not causing psychological harm to the children who play the game	• Introducing a level of abstraction with real-world debrief. Orbit is a game about a child alien spaceship that has been sexually abused by one of his/her crew. The game's website provides lesson plans to help the teacher unpack the game with students • Evaluating a small-scale trial of the game with schools prior to wider release. The game will undergo a rigorous evaluation before being released more widely
2	Making a game that teachers want to use. Teachers need to feel comfortable with game content, their ability to integrate the game into their classroom, the game's ability to engage their students and how the game fits their learning needs	Providing training information for teachers. The Orbit website provides information for teachers outlining the learning that takes place in each element of the game and how to respond to disclosures of sexual abuse • Providing lesson plans. Easy to follow lesson plans and accompanying classroom activities are provided. The online game and classroom activities are linked to national curriculum goals • Providing teacher login. Teacher online accounts allow the teacher to manage and monitor game progress of their class • Providing teacher player login. Teachers have their own player login and are encouraged to play the game prior to their students playing it and with their class
3	Minimising didactic game play that fosters a rote learning model. Many learning games rely on rote learning. Rote learning cannot provide adequate training for children to understand the emotional challenges around sexual abuse and disclosure. In addition, games which mainly focus on rote learning often fail to engage the imagination of children	• Using an adventure game model. Orbit is a playable story where the player is able to actively interact with the story • Create game to be online, social and can be played together in same room • Using mini-games. Orbit features four mini-games. Each of these mini-games has a connection to the story and the game mechanic is the key learning • Continuous forms of positive reinforcements (verbal encouragement) and implied (sound effects providing audio positive feedback to actions) • Level ups are available when a character gains enough points to add of accessories, clothes, etc. on completion of levels for their avatar and environment. Offer rewards and awards

4	Making meaningful design choices. Games are composed of a number of mechanics, dynamics and aesthetic components including story, animation, visuals, audio and interaction. These components are used by game creators to develop powerful learning experiences and powerful game experiences	• Matching the game's story to the intended learning goals. The story in Orbit is an example of how perpetrators use grooming techniques to sexually abuse children and how it is an adult's responsibility to protect children • Story and game-play must be linked. Either they are intertwined in the environment so that the story is in the gameplay or so that there are stories and related mini-games • Most games are situated in the present. Recommendation is to set game in the now, e.g. 'what should they do?' so players' response affects the story immediately, rather than past tense – 'what should they have done?' • The game should include human or human-like characters (e.g. aliens). Children will relate more to human characters and stories • Designing each mini-game to support the learning goals. Within Orbit, the robot factory mini-game teaches children about public and private body parts; the Need to Tell Machine mini-game teaches children about offender tactics and discerning between situations that need to be told to a trusted adult and those that do not; and the Speak Up mini-game teaches children about the barriers that exist to telling their trusted adults about abusive situations, and how these barriers can be overcome • Using ancillary sections of the game to model appropriate behaviours. The Need to Tell Machine features a guitar-hero style mini-game that visually shows messages flagged as 'need to tell' being given to trusted adults so that they can help the child deal with these 'need to tell' situations. The Speak Up mini-game is designed for side-by-side play so that a child and their trusted adults can play it together. The puzzles are solved through discussions and planning between the two players. The adult characters in the game have special abilities which are evoked to help solve each level. These include togetherness, listening, understanding, believing and courage • Use of music and sound effects should be considered for this game. Selected for the age of players and includes the types of sound effects, and the genre and style of the game
5	Inclusivity. Many CSA programmes do not adequately meet the needs of boys and games are generally thought to be of more interest to boys. In addition, there can be accessibility issues for children with disabilities or learning difficulties	• Equal access for all, engagement for all races and cultures, either explicit setting of stories to cover all possible races/cultures or generic stories which are relevant to multiple races and cultures, or create amorphous characters without race/culture, or allow players to create their characters which will represent their race/culture • Gender inclusivity. The child can select a female or male avatar and can customise the avatar at the start of the game. The gender of the ship character is then matched to that of the child. The situations and scenarios experienced by the ship are thus relevant to the gender of the player

(*Continued*)

Table 3. Continued.

	Key consideration	How addressed in Orbit
		• Social elements of game-play for girls should be provided. The game should have equal representation of gender and portray girls as equal, strong, heroes and in action roles
		• Activities, puzzles, stories, game-play should be equally appealing to both genders
		• Important to have gender-specific content and mini-games, such as board-game genres for female gamers, and first person shooter/roll playing games/sports for male games
		• Avatar generator inclusivity. The child and trusted adult avatars are customisable with skin colour, eye colour and facial features represented of people from all around the world. The avatar generator also has a wheelchair option
		• A customisable online environment can help children construct their identity. The game should allow children to personalise and customise their avatar and their home environment. As they achieve more within the game, they unlock access to additional features
		• Voicing of text. All conversations, instructions and information in the game is displayed as text on screen and voiced by voice actors
		• Free and downloadable. The game is available free of charge from the game's website. It is playable either directly from the website or as a local download
		• The player must want to interact with both story and games
6	Parental support	• Support materials have been provided for parents on the game's website • Need to support parents and other trusted adults to play the game with children as a way of spending time with children and encouraging parent/trusted adult and child discussions about the game and content • The site will provide education material specifically for parents and other trusted adults to convey details about sexual abuse. It will also encourage discussion of these issues with the children. Modelling comfort when discussing sexual abuse is likely to support disclosures • Parents can log into the game to learn more about CSA and to track their child's progress and learning • Game puzzle/strategy-based adventure games designed with social (family/ compilation) elements
7	Showing that offenders can be anyone. Most reported cases of CSA are by male offenders. However offenders can be anyone. Offenders are more likely to be known to the victim as sexual abuse by a stranger is less common	• A variety of offenders. The offender in the Orbit game story is known and familiar to the ship character. As the game unfolds the player learns about the grooming techniques the offender used on the ship. Within the mini-games a variety of offenders are presented including women, older people, younger people, family, non-family, familiar adults and strangers • Need to show that all types of people are perpetrators and extend the stranger danger concept. The child should want to imitate appropriate behaviour in protection situations (e.g. prevention of abuse, escape situations, seeking help, disclosures, etc.). Therefore, child should relate to the onscreen characters

8	Attracting the child and the teacher to the game	• Attracting the player to play the game. To be attractive to children, the game information should include in-game shots, game features (players, credits, number of games), game-play (what you can do), genre, characters (introduce attractive characters that child wants to play), narrative (introduce story – why play game), cinematic shots (show the environment that the child will play in)
9	Encourage involvement by trusted adults	• Side-by-side play. One of the mini-games is designed for side-by-side play and a second has a side-by-side play option. These mini-games are more easily completed through communication and discussion between the two players, and children are encouraged to player alongside their trusted adults • Log-in to the website. Trusted adults have a dedicated area in the Orbit game to which they can log in, track their child's progress, understand what the child is learning, leave a message on the child's 'I am good at' board and learn about responding to a disclosure
10	Role play. Research shows that most learning gains are made by CSA prevention programmes when children participate in role-play scenarios	• Scenarios feature in Orbit story and mini-games. Realistic and relevant CSA scenarios are presented in the mini-games and main story. The scenarios are based on reports from the QPS and counsellors • Role-play opportunities provided in lesson plans. Further opportunities to explore the scenarios via role play are suggested in the lesson plans given to teachers
11	Making it positive. Meaningful learning around sexual abuse prevention and disclosure are presented alongside positive learning experiences to grow confidence and self-esteem	• I am good at boards. The game has an 'I am good at' board where the player can choose statements of things that they are good at and these will display in one of the rooms on the spaceship. In addition, children from the child's class and the child's trusted adults can log in and add more items to their 'I am good at' board • Game achievements. The child has customisable spaces on the spaceship. As the player progresses through the game, they unlock rewards including furniture and toys that can be used to decorate their spaces on the ship. Players can also visit online other children in their class to see how they have decorated their rooms and leave positive messages • Building a trusted adult network. A key focus of the Orbit game is building a network of trusted adults to support the child. In each chapter the player 'beams' aboard the online spaceship a trusted adult. These trusted adults assist the child as they play the game. The child is guided by their choice of trusted adult and which represents trusted adults from their real life • Consider the game play, e.g. overcome evil, earn points, win battles (competitions with other children, time trials, credits, top earners), win race (race against non-player characters or other players), top scoreboard (schools, child), solve puzzles, simulations, build empire (own environment, home, room, clothes/accessories, friends, personal page, blog, etc.)

and key CSA prevention messages. We have shown how a games-based approach to learning prevention skills can provide a relevant and supportive mode of delivery within contemporary twenty-first-century educational learning contexts. Key to the productive development of this resource is the collaboration of interdisciplinary expertise that includes game designers, content experts (health promotion, social workers and psychologists) and educators. The paper has demonstrated that building a CSA resource is complex and involves developing a game that reflects elements of effective prevention programmes, maps key CSA messages within the game framework and utilises current understanding of games-based approaches to pedagogy for engagement and learning. The paper reports on the design and development of the Feeling Safe project and the Orbit online CSA prevention and disclosure game. Further research is required to explore complexities in designing serious games including a comprehensive evaluation of the impact of the Orbit game to CSA prevention.

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