

# Online Games-Based Child Safety Environment

Christian Jones

University of the Sunshine Coast  
Queensland  
Australia  
+61 7 5459 4849

[cmjones@usc.edu.au](mailto:cmjones@usc.edu.au)

## ABSTRACT

The Child Safety Awareness Project develops an online games-based educational resource to provide anti-abduction and sexual abuse prevention strategies for children aged 6 to 8. The key messages and strategies are based on global best practice and advice from the Queensland Police Service, the Crime and Misconduct Commission and Education Queensland, and designed to increase the child's awareness of situations which might impact upon their personal safety and to empower them with the ability to act appropriately. The online resources will be used as part of teacher supported activities within the classroom, as well as more widely accessible from a secure Internet site. The project evaluates the learning of children and usage of messages and strategies, and the affect of the resource on the child's self-esteem and confidence.

## Categories and Subject Descriptors

H.5.1 [Information Interfaces and Presentation]: Multimedia Information Systems - *Animations, Artificial, augmented, and virtual realities, Audio input/output, Evaluation/methodology*. H.5.2 [Information Interfaces and Presentation]: User Interfaces - *Graphical user interfaces (GUI), Prototyping, Screen design, Training, help, and documentation, User-centered design*. J.4 [Social and Behavioural Sciences] - Psychology, Sociology. K.3.1 [Computers and Education]: Computer Uses in Education - *Computer-assisted instruction (CAI)*. K.4.1 [Computers and Society]: Public Policy Issues - *Human safety*

## General Terms

Measurement, Documentation, Performance, Design,  
Experimentation, Human Factors

## Keywords

Games-based learning, Animation, Child safety, Sexual abuse prevention, Anti-abduction, Social and psychological evaluation

## 1. INTRODUCTION

The Child Safety Awareness Project was initiated by the Queensland Police Service (QPS) due to the increasing risk of child abduction, assault and abuse in the region and brought to public attention with the disappearance of Daniel Morcombe in 2003. The Child Safety Awareness Project aims to reduce the incidence of child abduction and

sexual abuse by increasing children's awareness of situations that might impact upon their personal safety and empowering them with the ability to act appropriate when these situations arise.

Between 1995 and 2004 the rate of abduction increased from 2.5 to 3.8 victims per 100,000 population [1]. Throughout this period the rate of kidnapping of persons aged 19 or less has been more than twice as high as of persons aged 20 and over. In 2004, of the 768 people who were abducted, 69 percent were female, while the rate for females aged 10-19 years was 17.5 per 100,000. Where victim/offender relationship was reported in 2003, abduction by offenders previously not known to the victim was most common (62%), followed by abduction by a non-family member known to the victim (18%), and by a family member (12%) [1]. Increasing abduction numbers lead to the development of the 'stranger danger' strategies, however stranger danger does not help prevent child abduction and abuse when the child is know to the perpetrator. 29% of child sexual abuse offenders are relatives, 60% are acquaintances, and only 11% are strangers [2]. Therefore there is a need for a combined resource which can provide advice to children to minimise the risk of both abduction and sexual abuse, and provide practical strategies to escape situations that may arise.

Data has suggested that children in regional and remote areas may be at greater risk of abuse than children in other areas [3]. In response, the project develops an internet delivered resource which can enable children in regional and remote areas across Australia to have access to the safety awareness message.

The project will build on the experience and evaluation of other child safety, abduction and sexual abuse programs worldwide, together with practical experience and real-life evidence in Australia from the QPS and the Crime and Misconduct Commission (CMC), to create best practice messages and strategies, accessible to children aged 6 to 8 using classroom activities and online computer based resources.

## 2. CHILD SAFETY AWARENESS PROJECT

The most vulnerable age for sexual abuse is between 7 and 13 years [4], and 84% of sexually abused children are victimised before age 12 [5]. The aim of the research is to define anti-abduction strategies for children aged 6 to 8 from an evaluation of other international studies and the experience of the QPS and CMC, and to develop interactive multimedia activities with which children can learn safety awareness strategies in the safe and controlled environment of the classroom and at home.

It may be difficult for this project to determine the impact of the computer based resources on preventing child abductions and sexual abuse, however the project may be able to show an increase in reported 'inappropriate approaches' and foiled abduction attempts by perpetrators.

Instead the project will determine whether the safety awareness strategies are understood by children and knowledge retained over a

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period of 3 months (follow-up). In addition, pre- and post-participation questionnaires completed by the child and the parent will evaluate levels of knowledge and attitudes concerning child abuse and prevention. At follow-up, parents and teachers will be asked to evaluate the affect of the project on the child's self-esteem, assertiveness and communication skills, and how and when any of the safety awareness strategies were put in practice.

The project is a four stage research, design, implementation and evaluation:

- 1) The research stage is a literature review of other international child safety projects and experience from the QPS and CMC.
- 2) The design stage compiles the child safety awareness messages and designs the multimedia computer based resource.
- 3) The implementation stage involves coding the design recommendations for Internet delivery.
- 4) The evaluation stage assesses the effectiveness of the project in providing safety awareness knowledge and skills.

The paper discusses each stage in turn. The project has completed stages 1-3. Stage 4 evaluation will be undertaken at the end of 2008.

## 2.1 Research literature review

The research stage has completed a literature review of other international child safety projects, and compiled information from the experience and advice of the QPS and CMC including 2007 Abduction Modus Operandi's.

The project builds on existing knowledge and experience to develop new best practice targeted at Australian children and using available computing resources to help children to role play anti-abduction and sexual abuse strategies in a safe and control environment.

The most commonly used program in Australian schools is the Protective Behaviours program (PB) which has been adapted from North America. The program has been criticised because it has not been rigorously evaluated, nor does it employ any technical innovation. Sanderson [6] concludes that there is a need to develop a child safety awareness program specifically for Australian children and tested with Australian children. Additionally, it is the intention of the research, that the computer based resource be adopted by the QPS and Education Queensland in support of other strategies for child safety such as 'Adopt-A-Cop'.

## 2.2 Design of child safety awareness messages and multimedia resource

The design stage has compiled child safety awareness messages and designed the multimedia computer based resource to deliver the messages. The child safety awareness messages are based on global best practice messages from other programs including: KlassKids Foundations, Yello Dyno, Kids Help Line, Safer Child Inc, Family Education, FBI Kids and Stay Safe. Many of these programs have similar key messages and strategies from which the child safety awareness messages for this project have been constructed (Table 1).

The design stage has compiled key features associated with children's acquisition and retention of prevention concepts and skills [6] including active participation, explicit training, standardised materials, integrated into schools curriculum, longer programs, parental involvement, and teacher education. The online child safety resources has been built to meet and exceed these key learning features with scenario and story-based skills and knowledge role-play, games-based rehearsal of appropriate behaviours, and a community-focused and integrated approach. The transformative nature of storytelling and scenario-based learning has been advocated for raising awareness about issues connected to a child's sense of self [7] which integrated with digital storytelling [8] creates a medium appealing and engaging for early childhood education.

**Table 1. Anti-abduction and sexual abuse prevention key messages and strategies**

Ask Parents First	Always tell your parent or carer where you are going. <i>Things to remember to tell your parent or carer before you go anywhere eg where you are going, when you will be back, how you will get there, who will be with you, phone if your plans change etc</i>
Stick with your Buddy	Better to be with a friend or group of friends when you are out and about. <i>Stick with your buddy, go with a group of friends, ask your parent or carer first</i>
Watch where you are going	Be careful where you play and where you go. Safe locations and routes. <i>Stay where there are other people, don't take short cuts, stay where it is light, ask your parent or carer first</i>
Trusted friends	Knowing who you can turn to if there is a problem. <i>5 trusted adults</i>
Finding help if you're lost	Who can help you if you get lost. What should you do and say. Who should you ask for help. <i>First call your parent or carer, do not go looking for them, go ask a mum with kids for help, ask a police officer, if you lose your friends follow the rules. Recognising police officer, recognising a police car</i>
Knowing and using your codeword	Using you codeword safely. When to use, what should you say to someone you don't know. <i>You and your parent or carer should agree a codeword, don't go with anyone if they don't know your codeword, never tell codeword even to friends</i>
Being safe when out and about	How to be safe when you are out with friends including when cars approach, strangers asking for help etc. <i>Never talk to, accept gifts, never get into cars, never go to someone who asks for help, grownups shouldn't ask for help, it's okay to say No, fight, scream, tell your parent or carer straight away</i>
It's ok to shout and tell	You shouldn't keep secrets and you don't have to do everything adults tell you to do. <i>It is not what people look like, but what they ask you to do, don't keep secrets, if says don't go – then go, it always okay to come home, tell parent or carer, how to remember people</i>

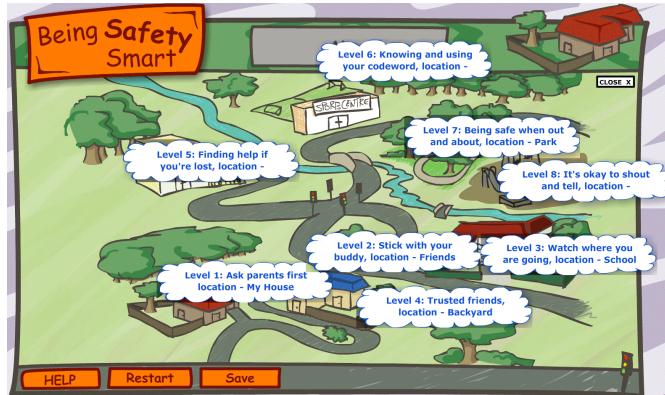
## 2.3 Implementation of online child safety resource

The implementation stage involves coding the design recommendations for Internet delivery (using Flash). The computer based resource is staged allowing more complex messages to be presented only after the completion of the core messages. The implementation has been iterative with feedback from the QPS and CMC team, as well as from Education Queensland teachers.

The key safety awareness messages are presented as eight distinct levels in an online cartoon-style game environment, where each level is located within the child's virtual world (Table 2). The child selects levels from an interactive map representation of their virtual world. Locations become available on successful completion of a previous level such that the child progresses sequential through the key messages and building on prior learning with more complex skills, behaviours and strategies (Figure 1).

**Table 2. Levels, key messages and locations in the Child's virtual world**

Level	Key Message	Location
1	Ask parents first	My house
2	Stick with your buddy	Friends House
3	Watch where you are going	School
4	Trusted friends	Backyard
5	Finding help if you're lost	Shopping Centre
6	Knowing, using your codeword	Sports Club House
7	Being safe when out and about	Park
8	It's okay to shout and tell	Playground



**Figure 1. Map view (with all mouse roll over messages displayed) allowing child to select each level in turn to access child safety messages**

On first entering the child safety awareness game environment, and on completion of each game level, the child is placed in their personal virtual lounge room (Figure 2). From here the child can load and save their game (encrypted load and save by selecting the games console), access levels (by selecting the TV displaying the map), and view additional information.



**Figure 2. Lounge room 'home' screen allowing child to select levels, create virtual profile, view certificates and parent information and load/save**

On first login the child creates a virtual Sims-style character to represent themselves in the game (Figure 3). This virtual character, and the child's name are displayed throughout the environment in both the presentation of child safety messages and the interactive games. The personalised character has been found to offer greater engagement of the child with the content. Once the virtual character has been created the child selects the map view and then enters 'level 1: Ask parents first', located at 'My House'.



**Figure 3. Virtual 'Sims-style' character editor allowing child to personalise their game environment**

Each level comprises of:

- 1) an instructional section
- 2) activity/game to reiterate the message and test understanding
- 3) and summary of key points

### 2.3.1 Instruction Section

The instructional section presents the key child safety awareness messages for the level using magazine-style cartoon windows and fonts, together with dynamic animations of scenarios (Figure 4 and Figure 5). All textual information is also presented as an audio track spoken by children of the same age.



**Figure 4.** Level 1 screenshots showing key message ‘Where’



**Figure 5.** Level 1 screenshots showing key message ‘Phone’

### 2.3.2 Activity/Game Section

The activity/game section reiterates the message presented in the instructional section and tests the child’s understanding thought interactive role-play and games. There are three main styles of activities: i) choice from three options as to ‘what to do next’; ii) selection of correct items from display of multiple items; iii) and interactive games. At the start of level 1, the interactive activity is type (i) the child must decide from three options what they should do (Figure 6). They are given additional information for each incorrect and correct selection to reiterate appropriate behaviour (Figure 7).



**Figure 6.** Level 1 activity ‘What should you do now?’



**Figure 7.** Level 1 activity. Child selects incorrect response and is provided with additional information to reiterate appropriate behaviour

On completion of the ‘what should you do now’ interactive story, the child then interacts with the content in activity style (ii) whereby they make a selection of one item from multiple items display of what details they must tell their parents or carers, (Figure 8 and Figure 9)



**Figure 8.** Level 1 activity. Child makes selection of item from multiple items displays



**Figure 9.** Level 1 activity. Child selects correct response

On completion of all level 1 messages and interactive activities the child is given a summary page with images and animations to reiterate the key safety awareness messages (Figure 10)



**Figure 10. Level 1 summary page to reiterate all key safety awareness message of the level**

The child is returned to the lounge room where a printed award for level 1 is now handing on the wall (Figure 11). Additionally, an information sheet for parents accompanying level 1 (Figure 12), is then selectable on the bookcase. The printed award for the child is image based with fewer words but includes the child's name and virtual character. The parent or carer print out is textual and explains the concepts and message of the level.



**Figure 11. Additional information for level 1. Child award certificate**

In addition there are interactive game elements throughout the 8 levels (activity style iii). These include drag and drop recognition of a Police Officer (Figure 13) and Police car, photo fit game to create people (face, hair, clothing) (Figure 14) and create vehicles (vehicle types cars, vans, and colours/markings); maze games to navigate from home to school as quick as possible along safe routes (Figure 15); and car registration plate game to remember partially obscured letters and numbers.

## Level 1 Ask parent or carer first

The child in your care has successfully completed level 1 'Ask parent or carer first' of the Being Safety Smart program. The child has learned key messages about always asking a parent or carer first before going anywhere with anyone, and what information to tell. The child has shown that they understand and can use these messages through successfully completing role-play examples in the on-line program.

### Level 1 key messages:

You must always ask your parent or carer first before going anywhere with anyone.

There are 6 things you must remember to tell your parent or carer before you go anywhere.

Tell your parent or carer...

- **Where** you are going.
- **How** you will get there.
- **Who** will be going with you.
- **Help** you can get when you're there.
- **Also** agree with your parent or carer on a time you will be back and how you will know the time. You could ask the person you are visiting to tell you when it is time to return home.
- **And get back** on time, or **call** your parents or carer with new information.

Does the child in your care know your phone number? May be you could talk to them about your phone number so that they could phone you if they are going to be late



For further information please contact:

**Figure 12. Additional information for level 1. Accompanying information for parent or carer**



**Figure 13. Police Officer drag and drop game - example three items for child selection – level 5: Finding help if you're lost**



**Figure 14. Photo fit person recognition game – level 8: It's okay to shout and tell**



**Figure 15.** Maze game – level 3: Watch where you are going

### 2.3.3 Evaluation of child safety awareness project

The evaluation stage will commence in November 2008 and will assess the effectiveness of the project in providing safety awareness knowledge and skills to children and the retention of knowledge and skills after 3 months. The children will form two groups i) training (involved with the safety awareness materials), and ii) control (no access to the safety awareness materials) group. The control group will commence the training once the training group has completed it, thereby minimising any chance that they be less well prepared for potential abductions or sexual abuse. A single group outcome design will be used to evaluate the program from the perspective of parents and teachers. Parental and teacher data will be collected before and after the program (and at the three month follow-up). Questionnaire measurements to be used include adaptations of the Children's Safety Knowledge and Skills Questionnaire [9] to measure the child's pre- and post- understand of abduction and sexual abuse situations, Battle Culture-Free Self-Esteem Inventory [10] to measure child self-esteem and confidence, and questionnaires developed for the project including a Parents' (and Teachers) Knowledge and Attitudes questionnaire to evaluate changes in parents/teachers knowledge, and a Parents' (and Teachers) Project Evaluation questionnaires to evaluate the impact of the project on child self-protection skills and self-confidence. Results will be compared between training and control groups for statistical significance.

Parents of children will receive information about the project and asked to complete a consent form for their child's involvement. They will also complete a pre- participation questionnaire to assess their knowledge of anti- abduction and sexual abuse prevention issues, together with general knowledge of sexual abduction problems. The participating child will complete a pre- involvement questionnaire to evaluate their safety knowledge and skills. The children will complete one level each week for 8 weeks under the guidance and support of the teacher. On completion of the program, the child and parent will complete post-participation questionnaires to determine any changes in attitude and knowledge. A follow-up questionnaire session will be completed 3 months from completion of the activities to assess retained knowledge. Both the training and control groups will complete all questionnaires, and results evaluated to consider whether changes in attitude and knowledge are due to involvement with the child safety awareness project. We also use a questionnaire to evaluate the project in terms of its impact on the child's self-confidence and self-protection skills, including any situations where the child has put the newly acquired skills into practice.

Learning skills to combat abduction and sexual abuse has a risk that the child may become confused and react inappropriate in normal and safe situations. However the materials will be learned through play and activities on a computer based resource allowing the child to experiment (in the third person) within a safe and teacher supported environment. The skills learned could prevent fatal abduction and/or sexual abuse by strangers and closer family members. In all cases, the research team, teacher and parents will monitor any changes in child behaviour including inappropriate use of learned strategies, anxiousness, upset, and confusion, and support the child with additional care and teaching. All teachers are to be given adequate training by the research team to support the in-class activities.

The project evaluation will report collective effects from child involvement with the safety awareness materials, both negative and positive issues. These will be made available to teachers, the QPS and CMC. In cases of undetected child sexual abuse the researcher, working closely with teachers and the QPS and CMC team, will disclose this information to the appropriate authorities.

## 3. Conclusions

The child safety awareness project is ongoing and we have completed the research, design and implementation stages which are presented in this paper. The child safety awareness game environment is fully operational and feedback from QPS and Education Queensland steering committee, and teachers, parents and children has been very positive. We will be undertaking the evaluation stage in late 2008 ahead of an expected national launch of the resource in early 2009.

## 4. Acknowledgement

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