Young People and Game Developers Working Together

Final Report

June 2016

Young and Well CRC
Unit 17, 71 Victoria Crescent
Abbotsford VIC 3067 Australia
youngandwellcrc.org.au

YOUNGANDWELL
Cooperative Research Centre

An Australian Government Initiative

CRC AUSTRALIA

Young People and Game Developers Working Together

Robinson, J

Title

Affiliation

Greenfield, S

Title

Affiliation

Whitkin, J

Title

Affiliation

Richardson I

Title

Affiliation

.

Suggested citation:.

Copies of this guide can be downloaded from the Young and Well CRC website youngandwellcrc.org.au

Acknowledgements

All funding bodies and non-author collaborators must be acknowledged. Please provide details of these and you may also wish to include the logos of supporting partners on this page.

Young and Well Cooperative Research Centre

The Young and Well Cooperative Research Centre is an Australian-based, international research centre that unites young people with researchers, practitioners, innovators and policy-makers from over 70 partner organisations. Together, we explore the role of technology in young people's lives, and how it can be used to improve the mental health and wellbeing of young people aged 12 to 25. The Young and Well CRC is established under the Australian Government's Cooperative Research Centres Program.

youngandwellcrc.org.au

`

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Mauris sodales gravida luctus. Maecenas quis felis est, id dignissim enim. Ut vel luctus quam. Pellentesque lacinia tristique ullamcorper. Aenean eget fringilla lectus. Etiam pharetra neque at eros placerat sagittis. Quisque faucibus dignissim nibh a venenatis. Proin ut tempus purus. Donec cursus aliquet tortor, faucibus facilisis tortor tincidunt at. Phasellus eget placerat sapien. Nam at ipsum eu quam egestas mattis.

Organisation's website address

Table of contents

Executive Summary

The ubiquitous popularity of video games among young people provides an excellent opportunity to explore how creative engagement, through game development, might be an avenue to increase wellbeing and self-efficacy in young people.
This pilot project had two focuses: to find out whether young people have an increased sense of wellbeing after engaging in the co-creation of video game prototypes with professional game developers and to find out whether an iterative, co-creative game design process is an efficient and valuable research method for game developers in game creation.

The main objectives of this project can be summarised in these questions:

- Is video game development a useful way for young people to increase their sense of wellbeing through increases in self-efficacy, community, and personal achievement?
- Does an iterative, co-creative game design process strengthen game design, and how might co-designers be best engaged during the co-creative process?

The methodology chosen for this study used the Participatory Action Research (PAR) framework, as the iterative and exploratory nature of the framework allowed for new methods to be incorporated as a response to both in-field group discussion and the subsequent discoveries.

Over a 16-week period, game developers collaborated with students from class years 5, 6, and 7 at a school with a high percentage of at-risk young people. They interacted with the young people in eight two-hour design workshops and created iterations for two separate games, titled “Zombie Pollution” and “Food Fight”.

The first four workshops focused on “blue-sky” brainstorming as an activity to teach game thinking. Blue-sky is a term used in game development to refer to design that is unencumbered by reality; that is, brainstorming outside of the constraints of what is currently known. The young people were involved in learning the game design process and then creating the idea of the game itself—from producing the game objectives, interaction design and concept art, to play-testing the mechanics. After each session, the developers created a new iteration of the game, which incorporated the young people’s ideas. They returned to the next session with the new iteration. Given this iterative nature of the methodology, the young people were able to get a sense of how their suggestions were incorporated into the design process. At the end of this activity, the young people and game developers had co-created a game, called “Zombie Pollution”.

The second set of four workshops focused on completing an educational game, which the game developers had previously started. The young people, having learned the game design process, were able to thoughtfully contribute to the design of the new game “Food Fight”. By doing so, they engaged in a repetition that was integral to their learning.

The young people had different data input methods during the duration of the project.

- Firstly, during the game development blue-sky process they were afforded the opportunity to think freely and create.
- Secondly, they were able to give specific input through the ‘refinement’ method via fill-in-the-blank question sheets.
- Thirdly, they were able to create self-generated reflections.
- And lastly, they contributed through post-workshop interviews.

To measure creative self-efficacy and resilience, the researchers used the Resilience Research Centre's 'Child and Youth Resilience Measure' (CYRM). The evaluation of the wellbeing of the young people was through their belief in their capacity to execute actions to attain specific goals. These were measured through the self-generated reflections and the post-project interviews.

For the young people, the combination of the blue-sky method (where they collaborated together with their peers) combined with their own specific input on the question sheets was critical to their understanding and learning of the game design process and of system processes in general. By learning the game design process, they reflected on their awareness of knowledge growth and in the post-project interviews, they stated their new found abilities.

The results of the pilot showed that teaching video game development in an iterative, repetitive manner is a valuable way to increase wellbeing for young people. Some of the most difficult-to-reach students showed an increase in engagement and an increase in stated self-efficacy.

A key insight was found when researchers asked the young people whether they felt they had mastered their understanding of game design enough to be able to teach students in the year level below them—there was a high degree of agreement. This stated self-efficacy has a direct correlation to the young people's wellbeing, as researchers are finding (Caprara *et al.* 2006). Self-efficacy and the belief in one's ability and power to succeed in an activity, has been tied to a high perceived sense of satisfaction, high self concept, positive thinking, and happiness.

The young people had created a significant relationship with the developers by the end of the research. They expressed the belief that the game designers were new positive role models with skills that they hadn't previously known about. By introducing the at-risk young people to the concept of gaming as a creative effort, not just as a consumable one, an inadvertent result was that formerly unknown skills of game design became more apparent and this understanding of these skillsets created new role models. This reflects an increase in wellbeing through community expansion.

In addition, video game development with their peers gave the young people a sense of both community and personal achievement - they felt that working with their peers in different roles in the game development process was important to finish the game, and that each of their roles were important and something they could hone their skills in. Another significant benefit was the young people's ability to discover engaging skills and roles in the workplace that they may not have previously discovered from their own household settings

Finally, the co-creative game design process had a big impact on the development cycle and the way the developers built the game. The iterative nature of co-creative game design gave the developers the ability to have their initial design ideas confirmed by the direct player. The developers reported that understanding the interest in connectedness via multi-player games was important, as was gauging the player satisfaction in the game level accomplishments. They reported concerns about whether the hardware controls would be both effective and usable by young people. They also stated that a key challenge was convincing the young people that their ideas were important.

Introduction

This research aimed to find out whether young people can be empowered by engaging in the co-creation of a video game prototype with professional developers—erasing the line between producer and customer—in a Participatory Action Research (PAR) framework (Kindon and Pain 2007).

The research also aimed to inform existing attempts to create creative self-efficacy in the classroom. Creative self-efficacy is a student's belief (even without evidence) that he or she is creative. Students with higher levels of creative self-efficacy are "significantly more likely to hold more positive beliefs about their academic abilities in all subject areas…" (Beghetto 2006, p.447). Video game co-creation has been found to foster creativity, imagination, and group work skills along with academic achievement, if the physical space is transformed into a playful learning environment (Kangas 2010). This research informs the co-creation literature by providing further examples and insights into methods of how intense collaboration between youth and their peers, teachers, and professional video game developers might be effective and practical in existing school settings. Self-efficacy was measured through resiliency using the Child and Youth Resilience Measure' (CYRM) as a tool.

Another intent of the research was to inform existing efforts to harness creativity as a method of increasing wellness among youth. The idea of engaging at-risk youth by enabling them to perform creative acts using digital media has been found promising (Richardson, Third, and MacColl 2007). These efforts have separated the individual acts of creation, from the social act of sharing and discussing the artefacts. Such an approach is clearly supportive of the connection between the artefact created and the individual's role in creating it. This research complements such efforts by exploring how a team-based approach to creating a single artefact (the video game) might still allow personal ownership and self-efficacy of the resulting artefact, even with minor roles and indirect creation. In other words, finding if young people can feel a significant sense of involvement and ownership even if their role in creation of the artefact is relatively distant and indirect.

This report presents the key findings from the pilot project that studied young people engaging in the co-creation of two video games. The project looked to see if self-efficacy and an overall sense of wellbeing increased through resiliency from the activities as well as whether the designers felt that co-creation as a design practice method had any significant outcomes. It looked to contribute to several different bodies of literature: creativity and wellness, creative self-efficacy in classroom settings, and video game design.

The research

The need for an alternate approach to quantitative methods of research in the specific context of young people and digital media has been argued previously within the context of Young and Well CRC research (Third *et al.* 2011). Accordingly, the research methods used in this study emphasised innovation, qualitative methods, and many hallmarks of Participatory Design methodology.

As such, it used both the Participatory Action Research (PAR) framework and a resiliency measure to both respect the young people's knowledge base as well as have a measurement for the wellbeing of the young people.

PAR is a recognised research method that affords the ability to make research more connected to and directly meaningful for a participating community. The PAR framework is set up to engage the participants in the research themselves through collaboration and equal partnership, with many reassessments and changes within the iterative cycles. These cycles go through planning, acting, observing, and reflecting (Wadsworth, 1998) which lets participants reflect on the previous collaborative data. This framework process, through this reflection, can then bring out much more relevant data and insights for the research. Additionally, because of the reflective nature of the framework itself that encourages collaboration, the research itself becomes jointly owned and hence can also bring about self-understanding, self-determination, or active positive change.

As a pilot project, the aim was only to collect and study the data in a depth sufficient to find out whether or not further research is warranted. The key researchers collated, reviewed, analysed and discussed the following data.

RECRUITMENT AND DATA

The research activities were held at Hilton Primary School, an 'underperforming' public primary school in Hilton, Western Australia. Originally the project proposed to work only with years 6 and 7 but at the principal's request, students were recruited from year 5 as well. The workshops were conducted in the school's computer laboratory, which had enough computers for students to work in pairs; however, these computers were 'locked down' by school IT policies so the project could not run the game or develop games on them. For this reason, six separate laptop computers with software were brought into the classroom.

Workshops were typically attended by two professional game developers, one or two lead researchers, one teacher, and 25 students. Our limited budget and staffing required dual roles for the researchers, developers, and the teacher. The developers were paid to be present as research assistants during the workshops, with the aim of providing significant time working directly with the students. The teacher role-played the customer in the first effort.

Major sources of data were:

- *Student and developer interviews:* After we held each workshop, we did semi-structured interviews with the students, exploring both their home life and their attitudes toward the research project. Weekly debriefing meetings and discussions

were also held with developers, which informed how the students' input influenced the games' design and production.

- *Teacher discussions*: Throughout the project, we held informal conversations with the teacher, who provided information on the impact the project had during the rest of the students' week.
- *Student-created artefacts*: Students created a wide variety of artefacts during the project, including sketches of video game levels, characters, colour schemes, written descriptions of feature ideas, as well as sketches of their own homes, discussions of their career ambitions, and other assignments. These helped reveal how students perceived themselves and the impact the project had in their lives.
- *Recordings of workshops*: We recorded audio and video in all the workshops. These recordings allowed review of the effectiveness of various activities.
- *Student exit interviews*: We conducted structured exit interviews with the majority of students. These interviews aimed to reveal connections between the project's activities and students' beliefs related to self-efficacy, as well as to provide information on the student's situation and world view. Both the students' home life and their attitudes toward the project were explored.

RESILIENCY MEASURE

This project took a resilience approach to wellbeing, utilising a multidimensional approach to resilience, specifically exploring how engaging in video game development is related to individual, relationship and community factors. Resilience is a positive approach to building coping skills and wellbeing in young people at risk, which fits the philosophy of this pilot project.

Wellbeing can be measured in many ways and, although there are psychological resilience scales that can be used, we felt that there should be a measurement that comes from a perspective of exploring how creative participation and engagement can enhance that wellbeing.

Because psychologists historically frame wellbeing in terms of individual traits and risk, there is a history of looking at interventions from a social learning framework that emphasises self-esteem, self-efficacy and situational factors along with psychological traits. Burns, et al.(2010) take a social-cognitive learning approach to web-game intervention. It is also important to note that even Dr Martin Seligman (2012) has shifted from 'happiness' to a five-factor measure of wellbeing (flourishing) in the positive psychology movement.

Ungar, et al. (2017) look at resilience as responding to adversity in a particular socio-environmental ecology. As such, individual characteristics are only one portion of resiliency. The adversity is seen as a dynamic relationship with the risk where relationship, community and government factors also play a role in determining individual resiliency at a particular time.

The project used the Child and Youth Resilience Measure (CYRM), an internationally recognised resiliency measure originally developed by the International Resilience Project. The CYRM-28 is a 28-item questionnaire that explores the resources that may bolster resilience of young people, from individual, relational, and communal or cultural levels . From this resiliency framework, we took a multidimensional resilience approach to wellbeing by exploring how engaging in video game development is related to the individual, relationship

and community levels. Although there are many factors associated with resilience, we specifically examined the following factors at each level.

- At the individual level, narratives related to the ability to solve problems, self-efficacy, self-awareness, having goals and aspirations, and empathy for others.
- At the relationship level, narratives related to the presence of a positive mentor and role models, as well as evaluating the impact of the experience on meaningful relationships with others at school, home, and perceived social support.
- At the community or cultural level, narratives related to specifically perceived social equity, access to education, information, and learning resources, as well as self-betterment and having a life philosophy.

These factors are also summarised in Figure 1.

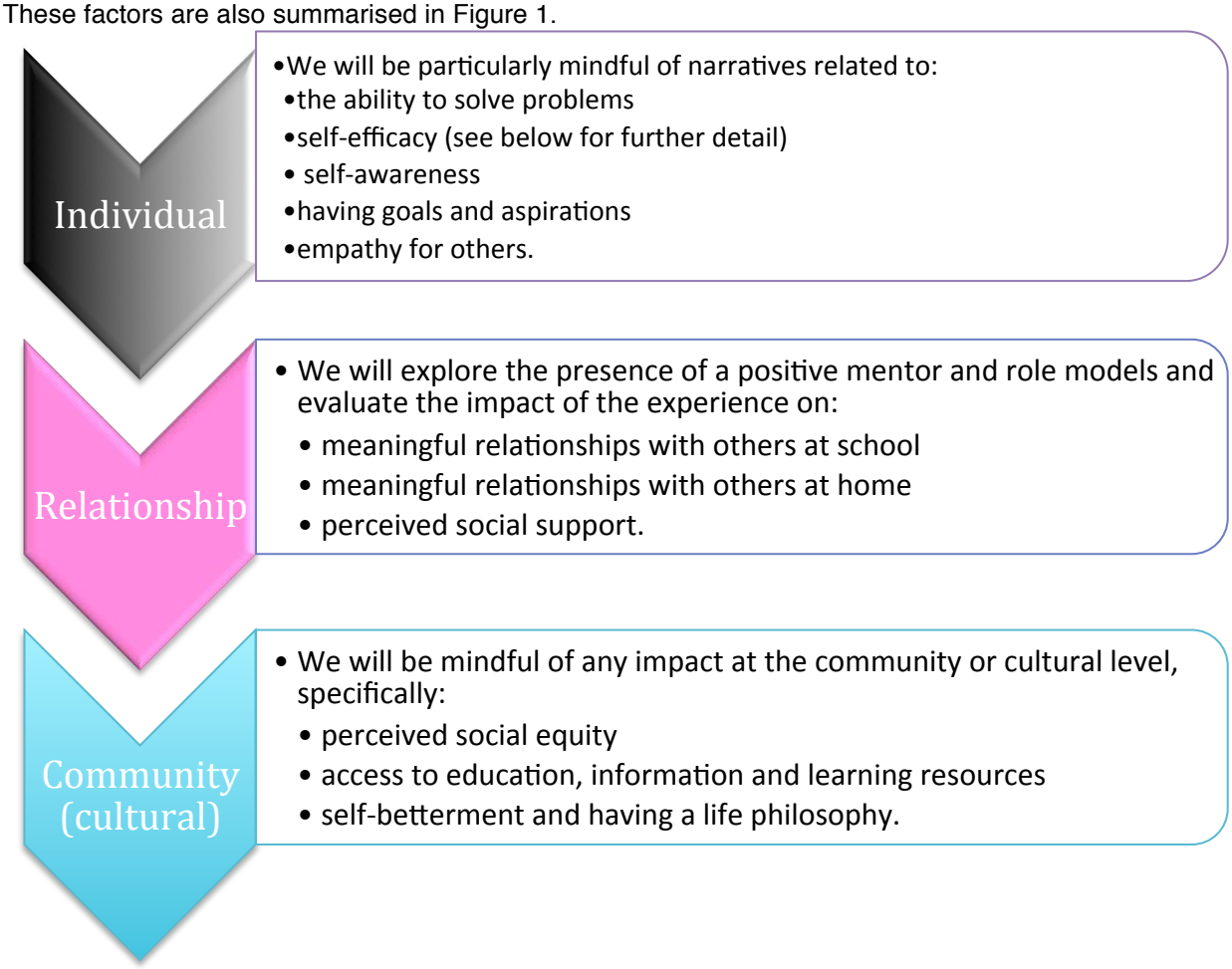


Figure 1: TBC

We took a qualitative approach to measuring resilience given the small sample size and exploratory nature of the project, rather than conducting a quantitative pre–post questionnaire measure.

ACTIVITIES

The primary activity was a series of eight two-hour workshops, which were held over 16 weeks to design and build two games. The production work was done outside of the workshops, in response to workshop design ideation.

The workshops were divided into two different efforts: Blue Sky and Refinement. The first four sessions were spent on the “blue sky” design effort. Students, teacher and developers collaboratively designed and developed a game called “Zombie Pollution”. The teacher posed as the customer to the students and students role-played designers. The teacher requested a video game with an educational goal of raising awareness of sustainability. The students sketched ideas and gave them to the developers. The majority of these sketches featured zombies. These apparently conflicting desires were combined by the developers into the game “Zombie Pollution”. Students were then asked to design how this game might look, work and feel. Again, developers collected sketches and combined the variety of ideas into a coherent single proposal.

The half of the workshop series focused on refining an existing game prototype called “Food Fight”. This fast-action, intensely competitive 3D game aimed to help young people engage on the topic of nutrition while having fun. From the developer’s perspective, “Food Fight” focused more on developer needs: Does co-creation confer important advantages to developers, over typical user testing? In some workshops, typical methods were used for user testing: a prototype was provided and a pre-set list of design questions (for example, “What unhealthy foods do you wish you could throw? What healthy foods do you wish you could throw?; Is the game too fast?”). Largely, the concurrent think-aloud method was typical in most play-testing. The researchers observed the students playing, and asked them to talk as they played, taking notes as they did so. Afterwards, a discussion was held on their reasons for particular decisions or problems if needed.

The eight workshops featured a variety of video game design activities. These activities aimed to provide students with three key experiences:

1. Learning about professional video game development.
2. Interaction with professional game designers.
3. Participation in the design of actual video games.

Four activities in particular are novel enough to merit discussion here.

YOUNG PERSON PARTICIPANT ACTIVITY 1: REAL LIVE FOOD FIGHT

The first activity was the “real life food fight” activity. After obtaining permission from the school’s principal, and with enthusiastic cooperation from the teacher, several kilograms of gelatine dessert (“jelly”) were prepared in numerous buckets. These were set out in a play area, along withsafety glasses and instructions. Then the children were divided into two teams and allowed to throw the jelly at each other. A variety of food, including fast food burgers, drinks, and fresh fruit and a white board were set up and the students were asked to smash the food on the board and take pictures of the splatters in order to create art reference.

The purposes of the “real live food fight” exercise were as follows:

- To provide the professional designers the ability to observe and experience a real, live food fight, to bring authenticity to the video game design work. This aim was achieved, though the benefit may not have alone justified the effort.
- To provide the students with a ‘reward activity’ so they were motivated to be involved with the research project. While the students did indeed enjoy the activity immensely, they were already highly motivated so the gain was low here.
- To impart the playful, slightly subversive nature that is common among professional game designers. This was the most useful and significant gain, as it helped reinforce

the “dream job” idea, offsetting the less thrilling work of actually designing and building good video games.

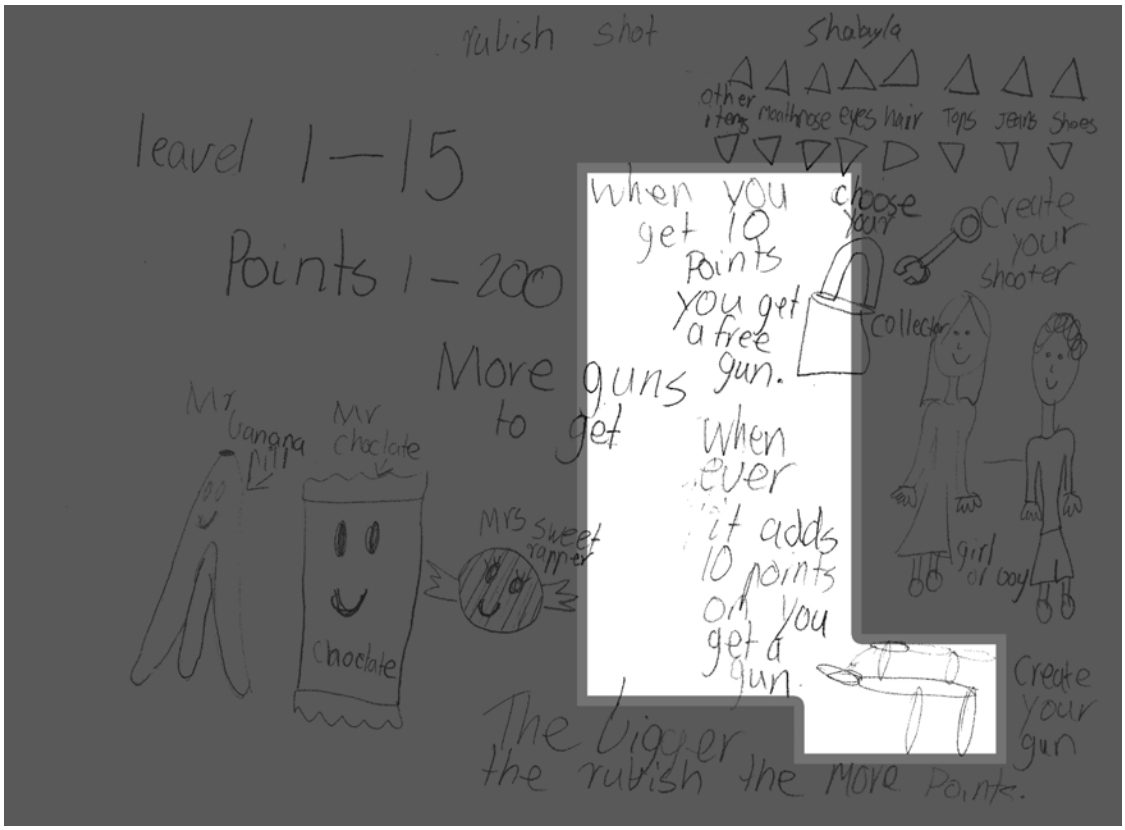
YOUNG PERSON PARTICIPANT ACTIVITY 2: REFLECTIVE DRAWING

One particular drawing-based activity was called “reflective drawing”. The aim was to inspire students by showing them how impressive their ideas were, when freed from the limitations of their own drawing skills. In addition, the aim was to demonstrate how game ideas were pitched, which also enabled the developers to critique students’ ideas efficiently and gently.

This activity was born from a number of needs in the first game project, including the need to quickly and fairly get 30 designers to agree on one cohesive game design. Ideation was no problem—students were shouting and discussing ideas constantly—but even when their 30 ideas were on paper, not all the kids’ ideas could be built. To somehow find one clear idea, it was considered to do it as a contest or competition but there was no single standout idea, and demotivating the young people whose ideas were not chosen was a fear.

Professional developers generally use a variety of methods to find a single cohesive idea. Typically, core team members conduct a series of live meetings and various smaller discussions to form competing pitches, and then criticise and refine the pitches until a somewhat clear vision is obtained. This vision is then prototyped and modified significantly before the team commits to building it. Throughout the ideation, professional developers use brief, blunt verbal criticism with each other. This is efficient, but not as useful in a school environment where that style can feel like a personal attack to many young people. While it was clear the students desired to impress the developers, the developers felt that the young people’s self esteem to be paramount. For these reasons, an alternate approach to ideation called “reflective drawing” was developed.

After a brainstorm-style discussion of the requirements, students were given a piece of A4 paper and a fairly open brief to “Create a game around sustainability”.. They worked mostly alone for 30 minutes, setting out their ideas. These drawings were primitive but reasonably clear.



A skilled artist took these sketches and redrew them during the week with additional amalgamated elements from various students’ ideas. At the next workshop they were reintroduced to the iterative version and then pitched the next game idea to build the game to the class and asked for critical feedback.

The students were observably deeply satisfied to see their own idea redrawn by a professional artist. They seemed to interpret this redrawing as proof that their ideas were interesting, valuable and taken seriously by a professional.

Students seemed comfortable publicly discussing the new pitch idea. There had been a fear that they would be reluctant to criticise any idea advocated by professional game developers, however they were willing to suggest improvements or additions. That said, they did seem reluctant to express negative-sounding criticisms. From this positive experience, several other activities were developed, which further explored the aims of the reflective drawing exercise, including a real-time sketching session.

YOUNG PERSON PARTICIPANT ACTIVITY 3: SELF REFLECTIVE INTERVIEW

Self reflective interviews were conducted during the beginning of the project to find out what the young people thought about their understanding of game design and development.

Many students displayed a moderately sophisticated knowledge of game design ideas, including valuing ordinary features like tutorials. A few students who had stated in the interview that they did not have existing game design knowledge, later rapidly picked up the ideas from interactions with their classmates.

DEVELOPER PARTICIPANT ACTIVITY 4: JOURNAL

The developers had not previously worked with young people before in their game development process. Week by week they would have various realisations about whether working in a collaborative fashion with their final audience was useful overall. They found that the motivation and actions of the young people varied:

> *"Some kids design to impress me; some design to challenge themselves; some are doing the assignment not really engaged or deeply interested (….) some design 'joke' genres to prank other class people."*

There were quite a few boons when working collaboratively with the young people. These included::

- design choices that developers would never think of.
- creative boundaries crossed quickly
- finding out what young people like

> *"They came up with things we would never think about. Some kids suggested we could have both cartoony and realistic. Maybe the art style changes during the game?"*

> *"They freely cross design boundaries or taste boundaries that we would struggle with. 'Recycle sword'. Driving around in a Ferrari and collecting trash."*

"It was surprising to see how they were mixing up zombies with sustainability. They offer us an honest view of their world. These ideas show us what they really like, dislike and what triggers them. In this case it was probably influenced by the game plants vs zombies. Other designs were also influenced by games they have been playing."

However, they did come upon a few challenges, including:

- time consumption
- audience attention
- influence from classmates.

"The downside is that it is more time consuming compared to a class discussion. The interviews and the class discussion reflected that kids are capable of thinking as a game designer and a play tester. Their feedback can be used to improve games, especially if you make a game for their age class."

"It's not always easy to ask design questions while they are gaming. Some kids had no problems with this but others never gave decent answers or tried to ignore the questions."

"We get most information from some of the kids. Should we only talk to a few and keep the others busy? If we split them up they are more focused. Should we only give construct to the most driven kids?"

"I have the feeling that they were also influenced by the ideas of other classmates (some of the drawings had more or less the same content). It might have been better if they would finish the assignment home instead of in the classroom (or in a more peaceful and creative environment where they aren't influenced too much)."

The developers found ways, tools, and future suggestions to help the design process:

- Specific guided brainstorms
- Interviews
- Groups
- Sharing iterations quickly

"Working with children for game developers is useful but time consuming. Having them come up with their own sustainability game design was pretty hard for them. But having them on a guided brainstorm (asking specific questions) works really well! They gave us so much brainstorm content during this week!"

"Some kids came up with pretty good ideas during the interviews. Others were pretty shy. The interviews seem to be a pretty good way to get information and ideas from them. "

"It might be a nice experiment to let them design a game in groups of 4 to 5. I wonder if they would come up with better designs and combine their ideas."

“Showing concept artist drawings to them was a very good idea to get them more concerned. Using these techniques they have a feeling that they can actually change and mean something. In following sessions we noticed that getting them more concerned and having multiple sessions increases their capability of thinking as a game designer. (i.e. their review on our food fight game).”

In addition, the developers recognised a need to keep in consideration their ethical responsibility as game designers and developers.

“What does graphical inconsistency mean for kids? They seem to care more about the tone of the game instead of the graphics. They want games to be so violent. Can we really do this? Is this ethical responsible? Project Zomboid is a game that is cartoony but really dark. Should Zombie Pollution be like this?”

In the end, the developers found it valuable to design collaboratively with their audience regardless of the obstacles because it was the completely different views of the students, compared with the adult developers that made the game playable for the students.

> *“This session shows that if you design a game for kids you better listen to them. They have a complete different view on sustainability. If I would design a game for kids around sustainability I would never use zombies, maybe not even weapons. This shows that working with children if you design something for them, might be critical.”*
>
> *“It’s very nice to see that almost all (or all?) pupils liked our design. It’s basically their ideas combined so we trigger what really matters for them. This approach really helps! I think this is a pretty good proof that if you design for kids that it’s beneficial to work with them.”*

Summary

—The participating students had a wide range of wellbeing. One segment of students were from working class Australian families, with reasonably stable home lives and supportive parents. Another segment had observable risk factors such as absent parents, very low household income and unstable family life. Attendance and lack of engagement was a problem for this segment, according to the teacher and principal. Basic literacy was also very low for this segment: the clarity of penmanship, spelling, and sentence structure seemed comparable to year 2 students from more privileged backgrounds. This literacy problem was a barrier for some of the exercises.

Also noted were a minority of students who were more committed to being professional game developers students who wanted to build their *“*dream game*“*. These students usually had a clear vision for a certain game idea they wanted to build, often modifying (“modding”) a favourite game. It was clear that they would gain great satisfaction from playing their game themselves. It was unclear whether they aimed to impress anyone beyond themselves with this game. This idea usually was a broad concept, rather than a detailed feature, and was not collaborative in its initial conception.

The ratio of students to developers made continuous one-on-one interaction prohibitive, so it was sometimes necessary to present to the class basic habits of game designers. For example, in the first session the students were asked to play a popular game “tank war”, and then discuss how they might improve it. This allowed developers to both assess and guide students toward a critical designerly approach (as opposed to a fan or consumer-based review) and more toward game ideation. The teacher, acting as the customer set the key requirement for a game design exercise to design a game that promoted sustainability.

It was unclear if the “blue sky” conception of game ideas was significantly more motivating than creative participation in an existing game project. Students were similarly motivated and excited by any role, provided that they were given creative freedom. There was significant drop-off in enthusiasm about a more constrained brief that required comprehension of design principles: “design a food fight level that follows these design principles”. Somewhat surprisingly, students were not significantly more excited to build an all-original game.

A significant increase in motivation within the at-risk segments of students was observed, which was very important to the teacher. They stated that the project had greatly improved engagement with the most difficult-to-reach students. After the first workshop, the teacher made particular mention of one student, who often did not engage during much of the school day, and usually sat silently. In the game development activities, the student was not particularly notable because they actively contributed to group and individual discussions much like the other students. The teacher was amazed by this change in behaviour and attributed it to the project. Additionally, there were some that found the collaborative nature of the research useful. When a researcher asked what the best thing about doing the games was, a young person responded that:

> *“I loved that we all worked together.“*

Though an increase in practical skills was not an aim, observably some of the activities channelled motivation into creative practical activities such as writing, drawing and analytical discussion. In particular, the activities seemed to inspire a strong interest in drawing skills. Students would often crowd around the artist, beg them to draw something, observe them drawing and then try to draw something similar back at their desk. These activities could be used to harness motivation to drive improvements in basic literacy, while acknowledging that other simpler activities might serve just as well.

> “*I learnt how to basically how to use a keyboard more and I know how to do, know how to make games now.”*

> *“Well basically I’d say you gotta take it slowly, you gotta get a piece of paper and work out how you want the game. Yeah. You just gotta take your time in doing the game. The person’s excited about it, he thinks the game will be done just like that, when it really won’t be. … Yeah you gotta take the time, and when it’s ready when it’s ready basically.”*

INCREASE IN SELF-EFFICACY

This project has generated support for the project’s central hypothesis: video game development can be a useful way for young people to increase their sense of wellbeing via increases in creative self-efficacy. In both exit interviews and in a free-form writing

assignment in week 2, many students named a career in video games as a “dream job”, along with jobs like animal doctor, rock star, pilot, and astronaut. As aspirational desire is related to self-efficacy (Beghetto 2006), so we feel there is some reason to believe this project may have increased self-efficacy in youth. Acknowledged is that the effect may not be a permanent increase, but as most students could name and discuss their specific contribution to the games even weeks after the event, this suggests that students had associated themselves with a professional game development project.

> *“I learnt that I’m a better designer than I thought. Like I thought like for designing maps and stuff for games, I thought I wouldn’t be good at it. But I’m better that I thought, a lot better. I’ve also learnt to make games, which is great. “*

The research aimed to encourage students to consider video games from a design perspective, and to identify not as a consumer, but as a maker, of video games. Some evidence that students did think this way was seen, but it was unclear how much of this thinking was present before the workshop began. For example, the first workshop began with the students being allowed to play one of the games they commonly played at school during recess, and then being challenged to answer the question: “What would make this game [the tank fighting game they had just played] more fun? What can I change about this game to make it more fun?” Students’ answers suggested that they were able to criticise games from a sophisticated consumer perspective before the workshops. Students adopted a designer’s way of thinking of video games during the activities when prompted, but it was unclear how permanent or pervasive this attitude was. Still, based on conversations with the students during and after the workshops, it is likely that students do generally think of video games from the design perspective more than previously, as a result of this project.

In relation to the observed increase in motivation among at-risk students, the motivating power of video games in the classroom is well established (Gee 2009). Since the teacher did not normally use video games in class, it is possible that any sort of video-game based project might have increased motivation.

PERSONAL ACHIEVEMENT

The young people reported that the experience of going through the design process and contributing to the research project gave them a sense of how to identify things they were good at and identify how to distribute tasks to their fellow students who preferred one task over another.

As they learned the process of game development, they learned what was expected as necessary requirements, how cooperation affected the game development process and what participation in a topic of interest did for increasing their engagement.

“I think it would be better if…” was an often-heard statement from the students during the sessions, reflecting a sense of design practice understanding as well as grasping the concepts of game design. It became an empowering activity because the young people were able to see their ideas become incorporated into the game.

> *“I learnt how to make a game. I never knew I could make a game!”*

In addition, video game development with their peers gave the young people a sense of both community and personal achievement. They felt that working with their peers in different roles in the game development process was important to finish the game and each of their roles were important and something they could hone their skills in.

At the end of the project there was a small graduation ceremony, where each student was given a certificate that credited them with their specific contribution to the final game. The aim was to give the students tangible, specific evidence of their contribution to the final game, as well as URLs where they could play the game and distribute it to friends for free.

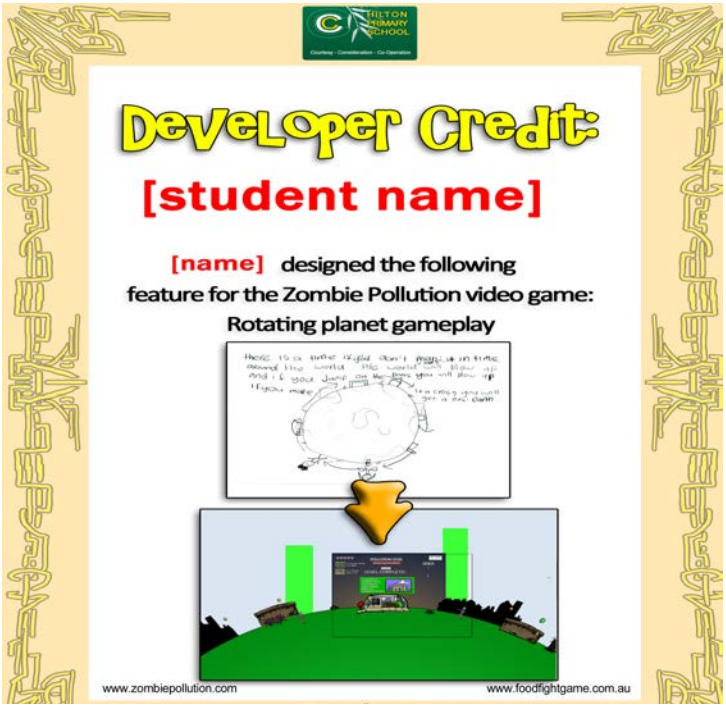
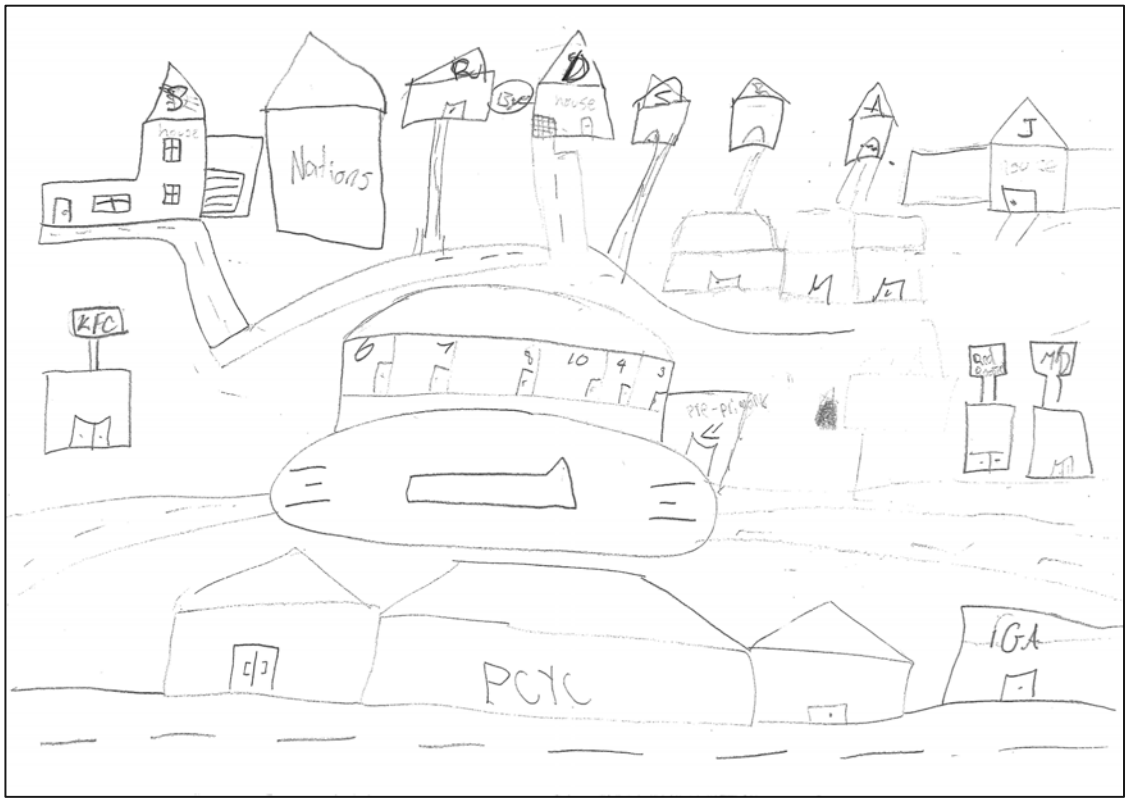


Figure X: Certificate presented to student at end of session, featuring the student-created idea.

> *"It was really cool, seeing on the piece of paper, the certificate, the piece of paper with your work and (then?) actually in the game..."*

FOSTERING COMMUNITY

A very positive outcome was the development of the community link. It was valuable to see the development of the community as well as individual. As the young people would state the places they felt comfortable and safe in, a re-occurring theme was the Western Australian Police and Community Youth Centre (WA PCYC), which was situated next to the local police station. The Centre creates opportunities for young people through both development programs and recreational activities.



The young people often stated that they felt safe and comfortable going to the Youth Centre where they would play video games; there seemed to be no stigma attached to the Centre, regardless of its physical and organisational proximity to the police station. Many of the young people learned about gaming and various video games themselves through this location. A key in self-efficacy enablement was through community acceptance. It created a positive effect in the community for the students to have a safe neighbourhood location where they could learn discipline and focus through gaming, be inspired by the staff as role models and have an awareness of other life choices outside the ones in their home environment. The students also felt comfortable knowing a new segment of people outside of their family; the developers were now considered part of their community. When asked if they felt comfortable asking the developers questions or if they would say hello to them in the street, the young people had a positive response. One young person stated

"Yes. I saw him in IGA, said hello."

DEVELOPER PARTICIPANT CO-CREATION

During the workshops, several approaches to interaction were taken with the students. Generally the aim was to treat them as peer professional game developers: the students were told that they were game designers, not students, and what was wanted of them was to conduct themselves as professional game developers. However, often the researchers had to "break role" and assist them as non-peers since they lacked professional culture, technical and cultural game developer knowledge, and practical game-building skills.

For example, an announcement to the group: "OK, developers, we need a multiplayer arena style level. Can you propose some ideas?" The students would start drawing various levels

and the developers would walk around and critique: “To design a level, start by drawing two wall heights: draw low walls as dotted line. Good, now decide a “choke point”). The aim in maintaining this fiction was to build resilience by providing them a positive alternate self-story: for two hours a week, they could be a professional video game developer. By doing so, the intent was to challenge any possible negative self-stories, and thus increase their sense of self-efficacy.

To achieve this shift in identity in the workshops, students were shown that school is a place where ‘weird things’ can happen. Beanbags to sit on were brought into the classroom, and generally encouraged an alternate approach to normal school activities. However, group discussions were difficult to conduct. This may be normal for any group of students given freedom to discuss, or it may be students were experimenting with the limits of this new culture. This rowdiness required the research developers to sometimes fall back on the teacher, who had to use conventional school discipline methods to maintain classroom order. This is something the developers found negatively affected their ability to ‘co-design’. This directly impacted the iterative, co-creative game design process.

As other co-creation projects have found, this project identified potential for a “win-win” outcome among all stakeholders—developers, students, customer, and teachers. From this project’s data, developers might benefit from using co-creation over playtesting in the following ways: having a longterm relationship, which means it’s personal, in a good way, for example, “all on the same team” when brainstorming; and by co-creating, the co-creators are more aware of the project requirements, and are more enthusiastic and keen than just play-testers.

Suggested improvements

By exploring the promising alignment between PAR and Design Studies goals, this project suggests that video games may uniquely engage youth as researchers, not test subjects. While this is encouraging, there clearly is need for further research on the methods and process that this project began to explore, to further develop effective projects that centre on video game co-creation.

The increases in self-efficacy that may have occurred from this or any similarly short-term project may not be permanent. This is an important weakness to this sort of project, and there is a need to find ways for projects that are intense and limited in time to be effective over longer periods of time. For example, in integration and scaffolding of student engagement with age-appropriate online game development communities such as Gamestar Mechanic from E-Line Media, which allow students to play the role of game designer with minimal need for external support from teachers or parents.

For example, to address the two preceding concerns, a future project might add an external customer as a stakeholder instead of a teacher roleplaying a customer, and high school aged students who already possess some game development skills. These two changes alone could greatly improve the possibilities of longer term collaboration and increased self-efficacy.

Though the project did not have the scope to explore these possibilities in detail, developers might benefit from using co-creation over play-testing in that co-creators could create publishable content, saving development resources. Students generate content, sketch, write

dialogue, design costumes, and so on. The quality wasn't sufficient to use what the students actually created in this case, but with older creators, a game design that required dialogue or lower skilled content, and more time for skills training, it could be an interesting option. It's less expected that focus group/play-testers would be asked to create content.

Conclusions

This project set out with the following objectives, by implementing a co-creative professional game design process for at-risk youth:

1. Assess whether video game development is an effective creative outlet by which young people can increase their sense of wellbeing, specifically through their sense of self (efficacy), community (working collaboratively with others), and personal achievement.

2. Assess if the process is "win-win": what benefit do they bring to all parties – youth, end-user/institution, and professional game developers? Does iterative, co-creative game design process make game design stronger? How might at-risk young people be best engaged when part of the co-creative process?

Though the project evolved, these objectives were met. All the data collected from exit interviews with students, and data gathered from discussions with the professional developers during the workshops suggest that there are important benefits to developers, as well as drawbacks, when using co-creation with youth to inform design of video games. There is also some reason to believe video game development can be a useful way for young people to increase their sense of wellbeing via increases in creative self-efficacy.

The co-creation project done in a PAR Frameworkhas several novel activities and approaches. Certain activities (for example, "reflective drawing") had important benefits to all stakeholders: teacher, , students and professional developers and even a small participatory design project can achieve near-professional quality in final product.

This practical example research addresses Kenny and Wirth's (2009) concern on how such projects might be designed. By experimenting with a variety of activities in a clear framework, we explored how a low-cost project based on video game design can reframe the experience and identity of at-risk students in a low-performing public school.

This project contributes to video game design literature in two ways. Firstly, this report offers further evidence of the efficacy of co-creation as a way for professional video game developers to understand their users, and gives practical examples of simple, cost-effective activities that validate and amend existing research. Secondly, serious games related to wellbeing might use participatory design to discover and identify characteristics that will specifically address shortcomings of previous serious games related to wellbeing, namely that of encouraging repeat visits and sustained use over time (Burns et al 2010). Several such characteristics were explored, as presented below. The PARframework was appropriate for investigating these aspects of gameplay with young people.

While far from conclusive, our results suggest that such projects may have the potential to improve wellness of even the most at-risk students in a class by letting their ideas become real, functioning products in a few weeks. We found that this experience causes them to consider the possibility that they could be future creators, not just consumers, of video games, even though they did not themselves build the video games in question.

References

Beghetto, R. 2006. “Creative Self-Efficacy: Correlates in Middle and Secondary Students.” *Creativity Research Journal* Vol. 18, Iss. 4, 2006

Bandura A. (ed.) (1995). Self-efficacy in Changing Societies. Cambridge

University Press: New York.

Burns, J., Webb, M., Durkin, L. A and Hickie, I. Reach Out Central: a serious game designed to engage young men to improve mental health and wellbeing. MJA 2010; 192(11): S27-30.

Caprara, G., Steca, P., Gerbino, M., Paciello, M., & Vecchio, G. (2006). Looking for adolescents' well-being: Self-efficacy beliefs as determinants of positive thinking and happiness. *Epidemiologia E Psichiatria Sociale, 15*(1), 30-43.

Cargo M, Mercer S. The value and challenges of participatory research: strengthening its practice. Annual Review of Public Health 2008; 29: 325-350.

Hagen, P, Collin, P, Metcalf, A, Nicholas, M, Rahilly, K, & Swainston, N 2012, Participatory Design of evidence-based online youth mental health promotion, prevention, early intervention and treatment, Young and Well Cooperative Research Centre, Melbourne.

Howell K. Games for Health Conference 2004: issues, trends, and needs unique to games for health. Cyberpsychol Behav 2005; 8: 103-109.

Kangas, M, 2010. “Creative and playful learning: Learning through game co-creation and games in a playful learning environment”. *Thinking Skills and Creativity*, 5 (2010), pp. 1–15

Kindon, S., Pain, R., & Kesby, M. (2007). *Participatory Action Research Approaches and Methods Connecting People, Participation and Place.* (Routledge Studies in Human Geography). Hoboken: Taylor & Francis.

Kemmis, S. 2006. “Participatory Action Research and the Public Sphere.” *Educational Action Research*14 (4): 459–476.

Kenny, R. and Wirth, J. 2009. "Implementing participatory, constructivist learning experiences through best practices in live interactive performance." *The Journal of Effective Teaching* 9.1 (2009): 34-47.

Richardson, I., Third, A., and MacColl, I. 2007. Moblogging and belonging: new mobile phone practices and young people's sense of social inclusion. In *Proceedings of the 2nd international conference on Digital interactive media in entertainment and arts* (DIMEA '07). ACM, New York, NY, USA, 73-78. DOI=http://dx.doi.org/10.1145/1306813.1306834

Seligman, M. E. (2012). *Flourish: A visionary new understanding of happiness and well-being*. Simon and Schuster.

Stringer E. Action research. A handbook for practitioners. Thousand Oaks, CA: Sage Publications, 1996.

Third, A., Richardson, I., Collings, P., Rahilly, K. and Bolzan, N. (2011) Intergenerational attitudes towards social networking and cybersafety: A living lab. Cooperative Research Centre for Young People, Technology and Wellbeing, Melbourne, VIC.

Ungar, M., Brown, M., Liebenberg, L., Othman, R., Kwong, W.M., Armstrong, M. and Gilgun, J. (2007). Unique Pathways to Resilience across Cultures. Adolescence, 42(166), 287-310

Wadsworth, Y. (1998) What is Participatory Action Research? Action Research International, Paper 2. Available on-line: http://www.aral.com.au/ari/p-ywadsworth98.html

Wadsworth, Y. (2010). *Building in Research and Evaluation Human Inquiry for Living Systems*. Sydney: Allen & Unwin.

Appendix

Author Biographies