Play to Grow: Augmenting Agriculture through Social Impact Games

Dr. Misha Myers

Executive Summary

Play to Grow explored and tested computer games as methods of storytelling and learning to engage urban users in complexities of rural development, agricultural practices and issues facing farmers in India. A team of UK/India academics and practitioners worked in partnership with New Delhi-based non-profit organisation Digital Green (DG) to create and evaluate the board game Bumper Crop, for both physical and digital platforms, which simulates experiences and challenges of being a small-holding farmer in India. Originally, aiming to evaluate effectiveness of social impact games for advocacy of complex social issues, our workshops and evaluations with focus groups of both young urban adults and farmers and DG mediators in India revealed new purposes and potential audiences for games. Evaluation results suggested the game created through the project was effective at promoting farmers’ own learning about agricultural practices. Furthermore, it was found that the game may suggest new methods for training development workers to better understand the communities they work with and to learn and practice skills in facilitating groups and modelling behaviour. This brings the game closer to DG’s core business of using innovative digital platforms for community engagement to improve lives of rural communities across India and Sub-Saharan Africa.

Researchers and Project Partners

Dr. Misha Myers, Saswat Mahapatra, Dr. Nina Sabnani, Dr. Anirudha Joshi, Dave Griffiths, Digital Green
Summary report

Collaborations

UnBox Fellows Misha Myers and Saswat Mahapatra and partner organisation Digital Green (DG) continued their collaboration through Play to Grow. Profs. Nina Sabnani and Anirudha Joshi, both of Indian Institute of Technology Bombay (IITB), were brought into the research team as new collaborators for their respective expertise in visual storytelling and animation and human computer interaction design for people in developing economies. They also brought connections and engagement with Design staff and students at Industrial Design Centre (IDC), IITB, which became the venue for core activities of the project. Towards the final phase of the project award winning game designer Dave Griffiths joined the research team to enable realisation of a more developed digital prototype of the game created through the project than originally anticipated and envisioned new directions for future research.

The initial advisory panel including Dave Griffiths, Game Designer, Kernow FoAM (UK), Prof. Naomi Alderman, Game Designer (UK), Megan Lloyd-Laney, Comm Consult (UK) and Nance Klehm, Social Ecologies (US), expanded as project activity led to new contacts and networks including Bharath Palavalli, Fields of View (IN), Guillaume Benoit, Head of Game Design, DSK Supinfogame (IN), Rohit Gupta, Game Designer (IN), Tasso Stevens, Co-Director of Coney (UK), Michael Straeubig, Game Designer, i3 Games (DE), Jen Southern and Dr. Katerina Psarikidou, both of Centre for Mobilities Research (CeMoRe)(UK). Gupta attended our first workshop presentation at IITB and Fields of View and Supinfogame provided support and advice during the project and helped to connect to games industry and related activity in India, which may lead to further collaborations.

During the project DG began up-scaling the organisation to work with new partners across sectors of health and nutrition and new locations in Sub-Saharan Africa, bringing opportunities to increase the Play to Grow project’s dissemination and potential global impact to a wider network beyond agriculture and India.

Project Evolution

The research team first met for a workshop at IITB (18-22 November 2013) to devise the multi-player simulation board game Bumper Crop based on small-holding farmer’s lives in India. To formulate new strategies, ideas and contacts for our game prior to the
workshop, Myers and Mahapatra participated in a game design workshop led by Gregg Barnett (Creative Director of Dhruva Interactive), and a closed-door mentorship with Barnett, Rajesh Rao (Dhruva Interactive), Manvendra Shukul (Lakshya Digital) and Vlad Micu (VGVisionary) at the NASSCOM Game Developers Conference (Pune, 15-17 November). Between November 2013-January 2014 Myers developed narrative content and rules for *Bumper Crop*. Mahapatra and Sabnani developed visual artwork for game equipment and prepared final production of a physical prototype. In January-February 2014, Joshi led evaluation playtests at IITB with focus groups of 15 young urban adults. In March 2014, Myers returned to Mahdia Pradesh with DG to consult with 24 DG mediators and farmers in Rajgarh. At the second project workshop (IITB, 21-24 March 2014), the team met to interpret feedback from the evaluations and begin design of a digital game platform. In June-July 2014, Griffiths joined the team to develop the digital prototype of *Bumper Crop* published on Google Playstore.

**Lessons Learned**

Over the course of the project the development of a virtual training framework (VTI) and video-courseware became a pressing concern for DG, as it would enable them to manage the expansion of partners using their platform and services as a result of their up-scaling more effectively. Therefore, questions about how gamification might enhance and contribute to the improvement of their training methods became a more immediate and relevant concern than just promoting civic engagement and awareness through games.

Although game evaluations with farmers and DG mediators (fig. 1) were originally intended as part of the project’s participatory design methodology to develop the game concept and narrative in consultation and co-authorship with these core stakeholders, a physical game platform allowed us an appropriate technology to physically playtest the game directly with this group. It was found that the game was extremely valuable to these stakeholders for their own learning, knowledge-sharing and enjoyment.

This led us to examine the efficacy of social impact games as tools and platforms both for advocacy and promotion of engagement with social issues, and for knowledge-sharing and learning of practices amongst communities and constituents. However, the evaluations with young urban adults did not present strong evidence for the effectiveness of the physical board game to promote empathy. In fact, some players tested seemed to perceive less empathy, generally, after playing the game, and playing to win was more important than playing for its narrative content.
In contrast, farmers and DG mediators’ comments suggested they enjoyed the game and took it very seriously, because it strongly related to their own life, which demonstrated the game’s potential as a serious device for their own learning of better agricultural practices and strategic planning and preparation. They also commented on the value the game would have to teach their own children how to farm. This led us to consider how serious games may be used as tools for engaging communities in sharing and learning practices and knowledge that may promote their resilience.

While the digital platform may appeal more to young urban adults, further evaluation necessary to confirm or dispute this is beyond the scope of the iterative stages planned for this project. However, we did find that with the move from the physical to digital platforms, the game design lost many of its most engaging strategic features, which required more sophisticated coding and artificial intelligence than was achievable within the available timescale and resources of the project. Nevertheless, development of the physical prototype did enable new potential purposes and audiences to be found for the game, and gaming in general, as an innovative new tool of communication and training for the development sector.

Future Plans

A funding bid was submitted for an AHRC Digital Transformations Amplification Award to continue collaborations with DG, researchers at IITB, Griffiths and to include the international network of advisors more actively in the research to develop an open source game design tool as a platform for peer-to-peer learning and knowledge sharing where games can be customised and designed cost-effectively and with appropriate technologies for rural communities in developing economies and rural development organisations. While unsuccessful, it received a 4 rating, which leaves scope for the bid to be refocused into a successful proposal. Funding will also be sought to disseminate the physical version of the board game created through the project both to wider audiences and to farmers working with DG.

The two abstracts produced as part of the project outputs will be written up and submitted for publication, as discussed further in the next section of this report.

Dissemination and Outreach

Five methods of dissemination and outreach were employed in the project as follows:
1) A 3D physical prototype (fig. 2) was created with a paper version of game equipment available to download on the project website. A digital beta version of the game (fig. 3) was published for free download on Google Playstore with the design process documented on Github and promoted via the project website, social media portals and mailing lists from relevant professional networks, together with partner’s and collaborators’ own websites, mailing lists, partner and donor networks and PR department at Falmouth University.

2) Two design, playtest and evaluation workshops were held at IITB each culminating with public presentations to approximately 30 invited games industry professionals, staff and students. A playtest was presented at the ‘Effectiveness of ICT for rural development’ workshop convened by DG (Delhi, 6-7 March) with delegates including the organisation’s wider global network of partners working on rural development issues, such as Oxfam, PRADAN, DIFED, Gates Foundation, Indian Minister of Rural Development and others. Catalyst Projects of Lancaster University provided funding for an additional workshop, exhibition and paper of the live action game prototype created through the UnBox Fellowship, as part of the Mobility Futures conference (4-6 September 2013).

3) A project website was built using Wordpress and included: an overview of the project’s aims, research questions, context and methodology; downloads including three project reports and two extended conference abstracts presenting project findings; a page giving an overview of Bumper Crop, downloads of paper versions of the game equipment, and link to the digital prototype. The website was promoted through similar channels to output 1.

4) While Games for Change Festival was proposed as the target international forum for final presentation of the project, the festival was moved forward by two months, which was too early in our schedule to present the prototype or evaluation results. Instead, we presented a playtest and position paper for the Storystorm Workshop at the ACM Design of Interaction Systems Conference 2014 (Vancouver, 21-25 June), which explored the design of storytelling tools across different disciplines and media. With additional support from Falmouth, we were also able to present the project at Videogame Cultures 6, Oxford, 17-19 July, providing an opportunity to present the project to a more focused audience of academics and industry professionals working in gaming, including a new contact at Supinfogames, France. In addition, a poster was presented at RCUK
Celebrating Collaborations Plenary (Delhi, 12 November), the PI gave a keynote talk on preliminary findings of the UnBox Fellowship at the Extended Narrative Symposium (Plymouth University, 2-3 November 2013), and presented the physical and digital prototypes and project findings at the Impossible Constellation: Practice-Led Research Special Event (University of Lincoln, 2 July 2014).

5) Two extended abstracts have been developed from the main conference presentations and these are available on the project website and conference websites. Each abstract focuses on different audiences, purposes and results from the project. One is being developed as a chapter in a book publication resulting from the Extended Narrative Symposium and the other has been discussed with the editor of Digital Games and Culture journal and will be developed as a full article before it can be submitted for final consideration and review.

Project Impacts

DG became interested in including game-based learning within a new VTI framework and worked together with the research team to produce a case study on the value of gaming for their primary stakeholders, which helped them develop their vision and case for support for the development of the framework. This project shows great potential for innovating strategies of training for both their mediators and farmers to share knowledge and develop skills and practices. It will also generate methods and tools, which are of direct benefit to their wider network of farmers, researcher partners, NGOs, foundations, government agencies, philanthropic foundations and India’s Ministry of Rural Development who played the game through the project and recognised its potential value. Furthermore, impact of this research has international reach as a specific socio-cultural case study with wider application to related contexts of marginalisation worldwide.

The project successfully sustained, developed and expanded a creative and interdisciplinary partnership between UK and India academics and practitioners and DG. A diverse network of contacts was developed, which extended those of partners and researchers involved. The various publication and public presentation opportunities of the project offered advancement opportunities for the team, all at various stages in their research careers.

The project’s iterative design and evaluation processes involved primary stakeholders (small holding farmers) as co-creators of knowledge by sharing their ideas, experiences.
and expert knowledge on agricultural practices. The methods employed through this project, which are discussed in the written outputs, will be of benefit to industry professionals as innovative participatory methods that engage diverse cultural experiences and expert knowledge in co-authoring and co-designing appropriate, relevant and representative content and platforms for social impact games and game-based learning technologies.

In line with recommendations of the Nesta Next Gen report (Livingstone 2011), the project brought together expertise in arts and humanities research-led innovation and video game development to promote rigorous interdisciplinary approaches that combine academic with commercial industry expertise, and partnership with a third sector organisation to address real world challenges, a model that will be of benefit to the wider games industry.
References and external links

Livingstone I. and A. Hope, ‘Next Gen. Transforming the UK into the world’s leading agent hub for the video games and visual effects industries’ NESTA/ Department of Education report, 2011.


**Fig. 1.** Farmers playing Bumper Crop in Rajgarh.

**Fig.2** Bumper Crop key cards containing game narrative content.

**Fig.3** Screenshot digital prototype of *Bumper Crop.*
The UnBox Booster funding scheme aimed to enable teams who have met through the UnBox fellowships to sustain, develop and expand creatively upon the collaborations formed.

Dr Emma Wakelin, Associate Director at the AHRC said:

‘The AHRC was delighted to work with the British Council, UnBox and the Science and Innovation Network India to support the UnBox festival 2013. Finding new ways to support UK researchers in the arts and humanities to work in collaboration with partners in the creative and cultural sectors is one of our priorities, as is encouraging international networks.

We were particularly pleased that all five UnBox Fellows in 2013 were successful in gaining AHRC booster funding, enabling them to continue to develop the collaborative projects and the fruitful partnerships they began during their time in India, and which they showcased along with their creative sector partners from the UK and India at the UnBox festival in Delhi in February 2013. This funding was intended to support the researchers to continue the innovative worked inspired by UnBox, to build on the valuable and creative networks initiated in India, and to explore research ideas that will have a tangible impact and would not otherwise have been possible.’