Linking University Curriculum And Community

Learn Programming with Scratch, Get Projection

Ian Frank/Yasushi Harada
Future University Hakodate
Kamedanakano 116-2
Hakodate, Japan
{ianf,haraday}@fun.ac.jp

Alex Grant
Toozalii Community Arts
Glenmore Business Park
Salisbury, United Kingdom
alex@toozalii.co.uk

***Abstract*—We use the Scratch programming environment to attract and to teach young students the basics of programming, and as a by-product to create animations that can engage the public as media installations. We especially plan to leverage our existing collaboration with an international music festival. Based on this year's experience, we will consider what other aspects of a curriculum (such as music, complex systems, design) could be suitable for taking into the community in this way.**

Keywords—programming, cross-borders learning, animation, ICTs, art, design, community activation and international linking.

I. INTRODUCTION

This research leverages an international collaboration between a scientist, a designer, a cross-borders community artist, and a large-scale music and arts festival. In terms of research, we draw together two disparate educational threads into a coherent and novel whole. First, we apply at a local level the cross-cultural concept of "Closing the Loop" between content creation and the use of educational materials via the use of the Scratch programming language [1]. Secondly, we utilise the opportunities we have created for meaningful exposure of student output via our previous research success in creating event installations at the World Music and Dance Festival, or "WMDF", held annually in Hakodate, Japan (wmdf.org). This work is the starting point of a project of at least two year's length. In this first year, we will generate Scratch content as a by-product of teaching local students programming, with the aim of displaying the results publicly. During the year, we will also hold open meetings at our home university where we will discuss with interested faculty the possibilities for taking other aspects of the university curriculum into local schools and the community. We therefore expect that in the second year we will be able to expose local students to numerous aspects of university education.

II. BACKGROUND CONTEXT & JAPANESE EDUCATION

The institution of the first two authors, Future University Hakodate (FUN), is a "regional" public university located on the northern island of Hokkaido in Japan that claims as a future aspiration "The re-invention of Japan's tertiary education system" (from www.fun.ac.jp/en/general/index.html, "General FUN Information"). Technology is an integral part of the University philosophy: for instance, the general information page also states that the University "focuses on applying new worldviews based on deep understanding of ICTs."

Nevertheless, as Pellowe has already argued elsewhere [7], most first year students entering university in Japan each April have little technical knowledge about ICTs. The stereotypical image of Japanese students may be that they grow up with technology as a ubiquitous component of their everyday life, but the reality is often far removed, as Japanese students often reach university lacking effective meta-cognitive strategies for understanding how to learn [4].

It is maybe no surprise that each year's student intake is perceived to have falling standards, and particularly to have little technical knowledge about ICT. Apart from specialty and private secondary schools, very little programming or interface design is included in the Japanese school curriculum. For example, high schools provide courses approved by the Ministry of Education, Culture, Sports, Science and Technology that are aimed at improving technological literacy, but in most public schools, the curriculum covers only typing, and how to use word processor and spreadsheet software, usually Microsoft Word and Excel. Basic HTML or webpage creation may also feature. The result for us at FUN, a technology-focused institution, is that many students every year have little working knowledge about the major they have chosen to study. Informal surveys of first year students show that less that 10% claim an interest in working in the technology industry in their future (or even an interest in computers or programming before entry), yet approximately 68% of our graduates are employed in the "IT service industry", the majority of whom are "Systems Engineers". We wanted to improve the meaningful exposure to technology and the understanding of programming ideas within our wider community.

III. PREPARATORY WORK

In 2012, we ran an extremely successful research and artistic collaboration across communities, generations, and nationalities, validating that disparate groups could create and learn from each others' designs. Representatives of the third author's Toozalii Community Arts (www.toozalii.co.uk) came to Japan and facilitated several workshops where designs were drawn by hand on large rolls of paper. Among the themes used was the science-inspired idea of the "Long Now" (for more information, see longnow.org). The designs are now being turned into batik flags by students in the UK (see Fig. 1). The finished flags will be returned to Japan, and displayed at FUN, around Hakodate and at WMDF during 2013.

We gratefully acknowledge funding from the British Arts Council.

Fig. 1. School children in the UK creating flags based on science-inspired designs created at a Japanese university

We are now planning to bring to this collaboration the "LAN" (Learning through Authentic Narrative) approach [2], which we believe can be a bridgehead in the endeavour to create and share knowledge. It is not controversial to believe that stories told by the members of communities can empower individuals by changing behaviour: particularly, narratives are much employed to impart identity and thinking from generation to generation. However, the effective and wide-scale dissemination of "knowledge" in this way within formal education is not mainstream.

We believe that an extremely straightforward framework can be created around some extremely simple technology that can allow all ages and nationalities to very simply create and share short stories. If these stories are about educational issues, learning can result. The basic steps in a LAN framework are:

- **Content creation**: provision to allow stories to be created (at the simplest level, with pen and paper, ideally in a digital movie format). We propose for the initial local exposure of university curriculum content, the use of Scratch as a programming experience for students. Content creation can also be self-sustaining, as participant student education groups further develop and pass on newly acquired programming skills to new joining school groups as part of a developing and progressive outreach plan.
- **Content distribution**: LAN educational resources are "online" to the extent that we can create distribution networks for them. For the current project, we plan to use online resources such as YouTube but also aim for direct in-community exposure via screen projection at the WMDF event in Japan, and possibly also in the UK. This will have the attraction that content creators can view their own work while surrounded by peers and elders.
- **Content management**: This final area of our framework will be developed as we build more materials. R&D has already been established in the UK through the Toozali Community Arts' educational outreach program within three strata of education.

IV. METHOD

The primary necessity in this research is to initiate the process of running workshops. The first two authors already have extensive experience in running Scratch workshops [3, 5, 6]. Once we start to gather samples and animations, we will work on creating animations for outdoor display. Toozalii are also carrying out preliminary work with UK schools in preparing design work and sprites that could be used in public screenings. Our initial plan for the Japanese screening will be to gain maximum exposure through inclusion as part of WMDF (the first author is also the festival director). Both the Scratch classes and public screenings will be evaluated by questionnaire. In future years, we expect to be able to expand the curriculum content beyond just programming, and to maximize the possibilities for cross-cultural collaboration, social collaboration impact, visual expression of scientific and cultural concepts, and creative learning techniques.

V. CONCLUSIONS

We believe that the educational opportunities offered by this collaboration are unique, and have significant potential to benefit the community (both home and abroad), to improve students' understanding of technology and of ICTs, and to create future interest in taking diverse aspects of university curriculum out into a town. Our experience is that a significant proportion of university faculty are insecure about running easy-to-understand workshops in the community. By creating a template and showing what is possible, we hope to create a groundswell of enthusiasm. The collaborators in this project make it possible for us to significantly involve the community in a cross-cultural and international way.

REFERENCES

[1] Frank, I., Field, M., Bagenda, B. and Shiiya, K., Closing The Loop: Towards A Low-Cost `LAN' (Learning through Authentic Narrative) Infrastructure for Community and Cross-Cultural Empowerment". *Global Learn Asia Pacific* 2011.

[2] Frank, I. and Field, M. H., Learning through Authentic Narrative: Towards A Low-Cost `LAN' Infrastructure for The Empowerment of Communities". (Abstract). *The Sixth Pan-Commonwealth Forum on Open Learning (PCF6)*, 2010.

[3] Frank, I. and Field, M.H., Starting from Scratch: Lifting the Educational Resource Course, *Proceedings of Global Learn* 2010.

[4] Holmes, B., ESL VLES: Self-Reflexive Constructionism by Japanese Students. In Paul Lewis (Ed.), *CALLING ASIA: The Proceedings of the 4th Annual JALT CALL SIG Conference,* Kyoto, Japan, p.189-192, Nagoya: JALT, 1999.

[5] Miyata, Y., Ueda, N., Onishi, K., Sowa, T., Harada, Y., Mogi, K., Tetsuka, C., Inoue, M., Designing Socially Meaningful Creativity Enhanced by New Technologies, *ACM Creativity & Cognition 2009*, UC Berkeley (USA), 2009.

[6] Miyata, Y., Harada, Y., Ueda, N., Sowa, T., Mogi, K., Matsumoto, R., Onishi, K., Beyond Programming: A Collaborative Learning Environment Powered by Scratch, PicoBoard, and Traditional Media, *Scratch@MIT 2010*, MIT (Boston, USA), 2010.

[7] Pellowe, B., Designing WebPages to Introduce EFL students to the Internet. In Paul Lewis (Ed.), *CALLING ASIA: The Proceedings of the 4th Annual JALT CALL SIG Conference,* Kyoto, Japan, p.203-206, Nagoya: JALT, 1999.