Student Involvement in an African Project

Bernard Griffin, Margaret Ross

Southampton Solent University
School of Media Arts and Technology
East Park Terrace year nine
Southampton, SO14 0RD
Bernard.griffin@solent.ac.uk, Margaret.ross@solent.ac.ul

Abstract

The paper discusses the involvement of students at Southampton Solent University in the development of software relating to projects for rural Africa. The views of students who chose these topics, are considered, together with the positive effect of these students' involvement on the whole class, not just those involved in the African projects.

The paper discusses how these students chose the African related projects, the requirement capture, and their outputs relating to the TULSA (The Universal Learning Support Agency) project.

The relations of the second year student group projects and the development of the TULSA project is discussed. This aims to bring "ready" prepared and functional small computer suites to rural communities, initially in Kenya. The technical problems and possible solutions are discussed.

Keywords: Student projects, African IT access, Rural access, TULSA

1.0 Introduction

There is a shortage of computing training in rural areas of Africa, especially for women and girls. The culture in many countries and the lack of menstrual aids, makes it difficult for females to attend classes regularly. There are issues of lack of shade, extreme heat and dust in some of the rural communities. In addition there is a need to maintain the security and maintenance of the equipment. The

major charities, which provide basic IT education, are mainly situated in the cities [1,2,3,4].

1.1 TULSA and the Container Classrooms

TULSA (The Universal Learning Support Agency) was founded by Bernard Griffin to provide the opportunity, particularly for women and children in rural Africa, to obtain education using the Internet [5]. The IT equipment has been delivered as a "package" in modified shipping containers, containing 10 computers and, if no power is accessible, then with solar-powered panels. This initiative has been supported by Southampton Solent University, which provided IT equipment that had recently been replaced. Support for this initiative has been obtained by the Government Department of Education in Kenya and the Kenyan High Commission .

2.0 Current Student Involvement

Students on the second year of the unit on “Engineering Software Systems” on the various computing degree courses at Southampton Solent University designed and developed software in groups of four. The students could choose from a variety of topics. Nine groups decided to design and produce software that can be used in rural Africa, possibly by the TULSA project. The students, not being able to investigate in situ, were shown a film, developed for TULSA which explained the problems and possible solutions. Interviews were scheduled for these nine groups with the TULSA founder, Griffin to establish the requirements and constraints for the different projects.

The range of projects included:

1. A self-diagnostic app on mobile phones for pregnancy and health education to help reduce childhood mortality and enable expectant mothers to receive the care and attention needed at the right time.
2. A Locator service for HIV/Aids patients showing the location of the spread of infection to enable better understanding of the scale of the issues and the appropriate actions required.
3. A business start-up guide for Chicken-rearing, in the form of a gamified training course which can be accessed on-line.
4. A road safety guide for children, in the form of a gamified training course which can be accessed on-line
5. A gamification training guide for programmers, in the form of a gamified training course which can be accessed on-line to enable better training programmes to be developed locally in Kenya.
6. Promoting Safe Water – a gamified approach to understanding the need and benefits of safe drinking water for rural areas

7. A football training resource for 30 clubs around Mombasa which form a sponsored league, a gamified skills training guide supported by league tables and club news.
8. Internet safety requirements for users – a gamified approach to educating new internet users about the risks and safety requirements.
9. A health and safety application to educate young people about risks around the home, including fire safety.

2.1 Student Views

All those students working on the rural Africa projects were highly motivated. They felt that they gained both practical experience and could also be involved in trying to solve real problems in Africa.

A series of interviews and questionnaires were undertaken with those students and there were particularly asked to identify the major benefits and problems associated with working on these types of projects.

The positive views included:

"The project has a real world life, rather than being discarded after grading"

"Helping other people in need"

"It probes us to create a professional & useful project, rather than simply checking grading boxes"

"Possibility to create something that benefits people"

"Creation of a product which will be used"

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"Motivation due to working on something of use and importance"

"Helping those in less developed countries"

"Nice to be doing practical work"

The disadvantages identified by the students, on these projects, included:

"Pressure to create a useful product"

"Pressure of not completing the project"

"Extra pressure due to real world impact"

“Not sure if the product will be accepted”

“Worry that end product is unsatisfactory”

“Not knowing the exact situation of a country and rely only on Internet for news”

“Communication with clients is very slow”

“They have limited technology to work with”

Overall, all the students found working on these real projects, the outcome of which could be of actual value to members of the rural community in Africa, was an inspiring experience.

“Thoroughly enjoying this project – because it's something we enjoy doing and our group is committed”

“The project goes well, everyone attends the sessions or tells someone if unable to attend through illness, appointments etc.”

3. View of Lecturer

The lecturer, Bernard Griffin, felt that although only just over 50% of the students in the unit were working on projects associated with rural Africa, these students were so involved and enthusiastic, that this had an effect on the other students. The result of this was high quality output from all the students and excellent attendance, regardless of their project topic. The class attendance figures was one of the highest of all the units undertaken by these students. By involving the students, it also had a positive aspect on and those setting up these "e-learning type cafes" in Africa. It was also inspirational to the students in Africa to use software that had been developed, in part, by students in the UK, encouraging them to see that they could achieve in Africa computing skills leading to careers in IT.

4. Future Directions

Today problems have been experienced using conventional IT equipment in Kenya, due to the heat of about 50 degrees Centigrade and the dust. Various modifications have been tried to the computer suites, which had been delivered on site with the 10 access points to the Internet. These modified containers required cranes to move them which in itself created major problems in rural areas.

The solution appears to be purpose-built lightweight "flat-pack" type of containers, that can be constructed by four men in one day. These containers

would be also equipped with ten computers plus the teachers' machine together with Internet connections, using either power or solar power. The computers have been specially produced with no moving parts, and copper bands to transmit the heat. They have been tested to work up to 65 degree Centigrade. These are already used in parts of Africa. The footprint and the cost of each of these fully equipped "containers" and working 10 machines is approximately the same as the original concept of modifying shipping containers with donated University IT equipment.

In both the original and modified schemes, it is necessary to provide training for the local teachers in using both the software and hardware.

Currently there are plans to use this system in rural communities in Kenya, Uganda and adjacent countries.

Presentations on the progress of TULSA and the establishment of these "container" type IT suites have been presented at Southampton Solent University, at BCS events in Southampton and also in London.

5.0 Acknowledgement

The Head of Education at the Kenya High Commission in London, and Southampton Solent University have been very supportive of this initiative.

6.0 References

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