義大利全面性線上學習計畫及實施成效

Lucia de Anna*　Valentina Della Volpe**

摘要

大學如何利用網路通訊科技進行全面性教學？是極具挑戰性的任務。所謂「全面性多媒體教學」，不只要符合各類學生（包括身心障礙生）的學習需要及潛能開發，也要顧及大學如何因應以下的多元情況：教育過程的品質、教育方法與組織、教師專業知能、整合策略與方法等。本文首先介紹 Network@ccessibile 計畫，該計畫由義大利六所大學共同進行，由羅馬大學的 Lucia de Anna 主持；參與該計畫的對象涵蓋大學教授、導師、學生、管理者等。其次，本次闡述羅馬大學三組碩士班學生的經驗。他們在本計畫中的非正式學習（例如個別的、專業的或文化的經驗等）活動，均可以採計學分。最後，本文展示研究成果，並討論實驗訓練成效及品質評估。本研究立於現有研究之基礎，發展一套執行計畫中的訪查工具，此次研究可視為進一步相關議題研究的新頁。

關鍵詞：義大利、資訊傳播科技、 E - 導師、身心障礙

* Lucia de Anna, 羅馬體育大學特殊教育學系教授
電子郵件：lucia.deanna@uniroma4.i
** Valentina Della Volpe, 羅馬特殊教育國中教師
電子郵件：valentina.dellavolpe@uniroma4.it
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The FIRB Network@ccessible Research Project

Lucia de Anna* Valentina Della Volpe**

Abstract

An innovative use of Information and Communication Technology through an inclusive pedagogical perspective can be a challenge when applied to on-line university courses. The concept of an inclusive approach of multimedia here focuses not just on the way in which the needs of all students, including those with disabilities in accessing, attending and achieving potentials on the programme are met but also on the way the University responds to diversity under the following elements: quality of educational path, method and organisation of educational environment, tutors' professional skills, integrated strategies and methodologies. In the first part of this article we carry out an exhaustive description of the FIRB research project Network@ccessible: teaching/learning together and for everyone in a life project. The FIRB project is carried out by six Italian universities and research institutions and coordinated by Lucia de Anna from the University of Rome "Foro Italico". The research is focused on university contexts involving students, tutors, professors and operators. In the second part, we focus on an experience that was carried out at the University of Rome "Foro Italico", with students of master degree courses. During the course, to recognize credits accepted in their training, the course used informal learning processes such as personal references on personal, professional and cultural experiences. In the third part we present and discuss the findings from the evaluation quality and effectiveness of the experimental training experiences. To carry out this study, we have

developed an inquiry tool on the basis of the existing research. This test can be considered as a first step of study to open further research paths on the covered topics.

Keywords: Italia, information and communication technology, E-tutor, disability

* Lucia de Anna, Professor, Department of Special Education, Rome Foro Italico
E-mail: lucia.deanna@uniroma4.i
** Valentina Della Volpe, Special Education Teacher, Specialised Junior High School
E-mail: valentina.dellavolpe@uniroma4.it
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Introduction

The Information and Communication Technologies (ICT) can offer good chances to spread and create inclusion processes: putting together different people and different subjects moving from an informal to a formal dimension and vice-versa during the learning process can enhance and develop a common background dimension to encounter the different educational needs of people.

In an inclusive context we can offer more learning opportunities by favouring the development of knowledge and enhancing the process of creating the competences in regards to the potentialities of everyone.

Inclusion is a process that has to be renewed each day. There is an on-going risk of exclusion or considering the situation under a medical perspective. People with disabilities might cause concerns because they might be regarded as different from normal people. People often think that if we analyse better the disabling factors we can find a more appropriate solution. The idea of communicating by establishing relationships and finding the way to interact with disabled persons by knowing their desires and needs is somehow not accepted. The use of the Internet can become an obstacle if its use is not supported by tutors that help and support students with disabilities also on a personal level if necessary.

In less complex situations specific tools are used to enhance its accessibility. In such cases these contexts are created and organised in an inclusive way to enhance communication, faster reactions and specific interventions, favouring the participation within the group and the work to be done using the Internet.

The Network@ccessibile Project

Background

An Italian research group coordinated by the University of Rome “Foro Italico” and made up by the University of Bologna, University of Rome “Roma Tre”, University of Naples “Federico II”, University of Trento and the Istitute “Don Gnocchi” of Milan, with the cooperation of the Universities of Cagliari and Turin, has worked from 2009 to 2012 to a FIRB project (Fondo per gli Investimenti della ricerca di base) approved by the Ministry of Instructions, University and Research (MIUR), called Rete@ccessibile: Insegnamento-apprendimento, insieme e per tutti in un progetto di vita (Network @ccessible: teaching/learning together and for everyone in a life project.) This research project is an innovative project in this sector.

Such research aims at creating the conditions to develop inclusive contexts on the Internet, by connecting learning and pedagogical aspects in the learning process together with the Internet technologies (de Anna, Della Volpe, 2011; 2012), with an eye to the structural and cultural accessibility, based on the new concept of accessibility established by the Convention on Rights of People with Disabilities of United Nations in 2006, validated in Italy in 2009 and reiterated in the more recent programs of the European Union (European Commission, 2010).

This project is mainly developed for university students in different fields of study, with the purpose of developing more informal learning environments along with more traditional educational paths.

The experiment involves everybody to know and meditate on inclusion, but mainly to be able to understand and to deal with different situations, thus becoming participant citizens by dealing with the responsibilities coming from the principles from the above mentioned UN convention on rights of disabled people.

If all of us fully understand the meaning of participation, i.e. helping other people's participation, it means that we are able to listen to others and we are creating an environment for the others, in which operate together (Canevaro, 2008). Such environment can be the Internet, platforms, forum discussions, the creation of knowledge, the exchange of experiences, the diffusion of knowledge of ourselves, our issues, but also our desires and challenges.

Goals and Objectives

The experiment tried to find social, pedagogical and technological solutions aiming at enhance a more satisfactory university inclusion of all students, including those with disabilities through the acquisition of cross competences and autonomy in the management of the own educational path, problem solving, meta-reflection, and re-elaboration of original ideas within new contexts of research and exploration (Novak, 2001; Spiro, Collins, Ramchandran, 2006; Song, Xiong, 2011).With this project we have tried to:

- Create and spread formative models and models of technological and inclusive development, testing them during the project over a sample of about 2,770 (Rossi, 2009; De Beni, Meneghetti, Pezzullo, 2010).
- Create a formative path for e-tutors that are expert in the inclusion process (Decamps, 2007; Depover, 2011);
- Develop models for the beforehand, ongoing and post evaluation of learning blended paths (Calvani, Fini, Molino, 2010).

It was vital to create a link between technology, special education and online learning, with the use of tools and technologies, with an eye on particularly severe cases, in the analysis of specific case studies, also considering dialog and narrative aspects.

Methodology

Given the inter-disciplinary nature of this project and the extent of the

involved areas of intervention, we have used a research methodology based on: active social commitment; theoretical elaboration and learning based on positive interventions and on the resolution of interpersonal issues linked to the community life, specifically dealing with the elimination of communication barriers, by identifying the most appropriate solutions:

1. To value the learning potentialities of the Internet in order to live the online dimension as a source of human development and try to eliminate communication and participation barriers and so create a connection between technology, special education and online learning.

2. Invest in tutoring, considered as a helping relationship and development resource, promoting the creation of peer groups, creating the conditions to get a valuable knowledge.

3. Organize an experimental tutor training made of standard classes and training in specific situations, assessing the competences, creating an hypothesis of training modules, in a blended learning system, in order to link together educational and technological needs, also specific ones, including the connection to specialized tutoring as per Law 17/99.

Activities and Implementation

The operating phases of the project are divided as per below:

- Conception and organization of the working setting (planning of an interactive platform for research and training, divided into three areas: Research area, e-tutors area and training/review area;
- Identification of the e-tutor to be trained and of the professional profile and educational path;
- Arrangement of the contents and training paths;
- Establishment of a strong workgroup that shares the issues of inclusion in the research procedures and in the identification of tools;
- Development and implementation of the training/review area

through the establishment of:

- A common environment where meet and share ideas and experiences, the leanings and the thoughts regarding online learning and its pedagogical and didactic implications and for the help desk;
- Seven subcategories of courses, specifically designed for university educational paths and the relevant subjects;
- Courses supply;
- Specialized tutoring actions (this involves tutors and welcome services for disabled people within universities, and it implies the connection between the environment, families, etc. In particularly severe cases, the tutoring has been delivered in partnership with the welcome offices);
- Comparison with different national and international experiences;
- Synergies and cooperation with other research institutes (Institute of Cognitive Sciences and Technologies National Research Council, Italy; Instituto Superior de Tecnologia em Ciências da Computação do Rio de Janeiro, Brasil; CEAD - Coordenação de Ensino a Distância and CCET-Centro de Ciências Exatas e Tecnologia da Universidade Federal do Estado do Rio de Janeiro, UNIRIO, Brasil; ISPEF-Institut des sciences et pratiques d'éducation et de formation, Universite Lumiere Lyon 2, France; etc.);
- Conception, creation and validation of investigation's tools;
- International audits.

Roles and Functions of the E-tutors.

E-tutors have been crucial figures during the project implementation. E-tutors guaranteed the common creation of knowledge; the inclusion of all participants and the ongoing improvement of the courses and the ways to make them actually effective. Eleven e-tutors have been trained and have worked on the *Network@ccessible* platform. E-tutors, during the project, acquired competences, methods and the necessary tools to plan

and control an online student-centered course, paying attention to the main topics of inclusion and pedagogical accessibility.

The meta-reflection on the professional profile, contents and features of the formative model specific for e-tutors that are expert in the inclusive processes for disabled students within universities, has shown much information that led to the hypothesis of a formative model divided into three main areas of competence as explained below:

1. Didactic *and pedagogic competences* (helping relationships, mediators, life project and elements of online teaching).

2. Technological competences (main aids for people with special educational needs (hardware/software; guidelines on accessibility; medium/high systems).

3. Cross competences (elements of group dynamics; elements of work planning).

Interactive Platform Features

We created the *Network@ccessible* platform for the online activities of our project.The design-time is characterised by a blended learning approach, which combines face-to-face teaching with computer-mediated teaching. In order to include as many participants as possible, the project used an accessible learning management system.

After evaluating different e-learning platforms we have decided to use Modular Object-Oriented Dynamic Learning Environment (Moodle). Moodle is an open source web-based learning management system (LMS) designed with an eye to accessibility and adaptability. The reason behind this choice is that Moodle is the best known and most widely used system, and also the easiest one to use. The LMS has been customised to allow a distance learning experience with a strong pedagogical, inclusive, social and constructive approach.

The rules for implementing it are based on the accessible web principles. Such accessibility is not only from a technological point of

view, but also based on the principles of pedagogy that contribute in the development of the human being (Mura, 2011).

The *Network@ccessible* platform, at the end of the process, involved a total of 2'770 users including teachers, students, e-tutors, external experts and guests.The *Network@ccessible* platform is split into three areas, each of which has diversified access permission:

1. Area Ricerca (Research Area. It is an area for plan and organize the research procedures); 2. Area e-Tutor (e-Tutors Area. It is a common area for training and communication between e-tutors); 3. Area Formazione-Aggiornamento (Training/Review Area. In this area we have involved students belonging to different universities).

Figure 1 The homepage of the *Network@ccessibile* interactive platform

Pilot Experiences at the University of Rome "Foro Italico" Organization of Educational Environment

In order to test and spread the new cooperative training model and the new inclusive and interactive pedagogical approach, the University "Foro Italico" of Rome has organized three pilot experiences in three different

sports and movement sciences undergraduate courses. The three pilot experiences have been carried out in the training/review area within the *Network@ccessibile* platform.

The courses used informal learning processes (Bonaiuti, 2006) such as personal references on personal, professional and cultural experiences in order to recognize credits. The courses are based on the principles of the learning philosophy, according to which the individual that is learning is not just a passive and receptive person, but he/she is instead at the core of the process, actively building the knowledge framework in a personal and specific way, starting from the various incentives and forms of representation the student deals with. The training has been organized in a sequence of activities:

1. Design of the on-line learning environment for group interactions;

2. First face-to-face meeting, introducing goals, contents, methodologies and tools of the project and finalizing the learning agreement with the participants;

3. Training of students on a real case study (the object is negotiated between all participants);

4. Remote drafting of an Educational Project on the study carried out by each cooperative group;

5. Second follow-up face-to-face meeting for a final evaluation test.

One session a week has been scheduled: each one consisted of an online workshop meeting and a follow-up meeting. The participants, divided into subgroups, discussed on the topic covered and the linked inclusion process, supervised by their tutor. The system gave the tutor the chance to offer their expertise to improve the performance of the students.

As part of the activities scheduled in the interactive teaching plan, the participant takes part in synchronous sessions (together with other participants and the tutor) or asynchronous sessions designed to case study with specific contents and goals. All activities are supervised by a tutor, who provides feedback on strategies and evaluate outcomes (how well

each group has achieved its own specific goals, how well it has achieved the general goals of the process). Each participant takes part in at least five sessions. Each session consists of:

- A preliminary message sent by the tutor via e-mail;
- Negotiation between participants in order to constitute the working groups and to choose the research field for the educational project;
- The design itself using the wiki for shared writing;
- A feedback meeting, during which the tutor analyzes the interactions, draws conclusions and organizes the next session;
- A forum (via web) where tutors and participants exchange ideas and suggestions.

The final meeting aimed at measure the outcomes of the experimentation, to learn about participants experience and to collect ideas for the improvement of the prototypes.

An Inquiry Tool

Feedback from students was gathered throughout the duration of the course and assessed with a questionnaire at the end of the course. The questionnaire was created in order to:

- Detect the impact and the quality of the educational experience, assess the quality and the importance of the online tutoring and didactics;
- Create a map of the pedagogical scenery in which the formative paths have developed;
- Detect how the learning environment was created and specifically the designated online environment, the usability and accessibility indicators to the virtual path, in terms of quality and ease of use of the platform itself.

The idea of creating such assessment tool generated from the need of conducting an explorative investigation for the retrieval of information on the four areas below:

1. Tutorship — (Question) The tutor, which is expert in the inclusion

processes and has the competences to develop independent learning skills in every student within the online environment by integrating pedagogical and technological competences, is he/she able to manage complexity in an online learning environment?

2. Educational purposes — (Question) Can an online learning environment, developed to include miscellaneous university students and for the inclusion of those with disabilities, favour the cooperative creation of knowledge through a sort of social negotiation and the awareness of the different learning paces of everyone? What is the best way to organise an online learning environment to offer permanent and accessible features for everybody?

3. Planning approach — (Question) How does a university student, in this specific case belonging to the "Foro Italico" University, evaluate the importance of an online educational path in terms of expectations, impact and results on the topic of inclusion? What is the role of the student in the teaching/learning process? What is the level of satisfaction about the own educational path in regards to knowledge, competences, achieved goals and innovation of the proposed didactics and methodologies used?

4. Interaction — (Question) Given a specific learning environment, in which the creation of the topics are negotiated between teachers and students, is it possible to detect issues, intuitions, needs and hypotheses that in the traditional didactics would get lost and the common potentials with the creation of online forums?

We have tried to understand whether it was possible to enhance knowledge and competences within students as well as curiosity and motivation through the use of multimedia tools, working in a generative learning way (Jonnasen, 1994; Grabinger, Dunlap, 1995) in a planning approach.

Construction and Validations

The questionnaire was developed based on the literature review, i.e.

analysis and review of the literature on the specific research topic. Our analysis has detected various researches on the e-learning management (Khan, 2004; Ardizzone, Rivoltella, 2003), online learning and constructive didactics (Calvani, Rotta, 2004; Carletti, Varani, 2005, 2007), didactics and multimedia (Maragliano, 1998; Trentin, 2004, 2006), the profile of the e-tutor (Rotta, Ranieri, 2005; Rivoltella, 2006), providing us with good bases to carry out our work.

We have then applied the *Delphi* method and we have created an expert panel (group of experts) to reach the final stage. More precisely we have used a specific technique of the method, systematic and interactive, face to face meetings, so we can in fact talk about mini-delphi or estimate-talk-estimate (ETE).

The test has been validated through the measurement of the reliability of the internal coherence between areas and items and their significance (the consistency of the framework has a value of 0.970 Cronbach's alpha. Such value is close to excellence). We analyzed the inter-relation between the four areas that form the tool by calculating the stability index represented by the Pearson's coefficient (all correlations in our analysis are substantial and positive). All questionnaires are made of questions based on an attitude scale, based on 5 points (strongly disagree, partly agree, neutral, agree, strongly agree) where the participants express their evaluation always based on the same scale.

The participants have been given a number of statements (40 in total) regarding the attitude to investigate about a specific semantic area and its sub-areas. The questionnaire was submitted in anonymity. The questionnaire can be considered as an initial step leading to a deeper analysis of the covered topics (Besozzi & Colombo, 2002; Lucisano and Salerni, 2002).

Sample Group

The sample of the formative event is in regards the blended path

organized by the faculty of Didactics and Special Education of the “Foro Italico” University for 453 students belonging to the master degree course in Motorie, preventive adattate activity.

The sampling design is based on goal oriented strategies, i.e. they choose cases based on their relevance for the conceptual clarification and for the understanding of specific educational paths to be investigated (Strauss and Corbin, 1990). The sample is mainly made of male students (M=255, F=198), this is in accordance to the estimates of the students attending the “Foro Italico” University. 1.6% of the sample is made of students with disabilities, this is also in accordance to the percentages of disabled students attending such University during the academic years 2010-2011 (source: specialized tutoring. Welcome services, "Foro Italico" University).

Data Analysis

Methodology-wise we have done the following:

- Detect, for each sematic areas, the relevant variables and levels to consider;
- Create an electronic database to allow an inference-wise analysis;
- Analyse data and available information by disaggregating topics and levels into areas.

After performing the initial explorative analysis through the frequency distribution and contingency tables, we used mono-varied investigation techniques taking all variables into account, one by one, creating the frequency distributions in order to check the accuracy and reliability of the data. In such context, we have checked the absolute values, the response and non-response rate, describing the investigated areas. Using a bi-varied analysis we have taken the analysis to the next level and performed a trend analysis on all single variables and their inter-relationships. Based on the distribution of the answers, sums of raw and average scores of each participant, we have found very little differences

in their responses, and a high degree of satisfaction for the path they have followed (for a more detailed analysis please see chapters 8 and 9 of the PhD thesis, Della Volpe, 2012).

All the above results have to be considered with particular care, as they're self-referred and also they're based on a relatively small sample. However, we can say that:

- All students are fully satisfied with their learning path;
- The more the participants re-elaborated and absorbed the topics of the learning path in regards to awareness and knowledge, the more they expressed a positive judgment about it;
- Students with disabilities perceived and lived their learning path as a fully inclusive experience.

Given the results in the 4 areas we can further our analysis:

1.Tutorship — The e-tutor, operating in an inclusive virtual environment, has to have deep understanding of integration processes. The e-tutor has to be able to create and activate formative processes based on specific needs of any single student, in order to have the students succeed, by making the learning experience effective and successful. The e-tutor might also help students follow the most suitable paths necessary to reach their personal goals.

2.Educational purposes — Online work sessions have proposed didactic strategies on how to learn through acting, in which students were the main actors of the learning process in regards to self-cognition, responsibility and reflection, with an active role in the creation of their own knowledge and acquisition of competences. In fact, the main goal of the inclusion is to get students to actively participate within the class (Ianes, 2005), and everyone has to have the same formative resources. Hence, the analysis of the data in such research area shows that one of the educative goals of the path focused on the development and consolidation of cross competences.

It is necessary to get to a proposing pedagogy that supports the

conversational and dialogic value of the learning paths, in which everyone's issues are gathered and re-elaborated through an effective interactive communication, activating a positive inter-dependence that can incentivize a socialized external learning as well as meta-cognitive skills that allow the development of personal and social skills of the students (Andrich Miato and Miato, 2003).

3.Planning approach — While analyzing the data, we have found out that online learning is based on an environment that is free from the rigid rules of an objective approach, but it enhances the exchange of knowledge and information.

The attention moved from the product to the process, in which the strategy is measured with the variety of situations and problem, and such change impacts the planning that has to be flexible and complementary (Rossi, 2009). We can try to define the inclusive online learning environment as:

- A formative scenario as an integrating background;
- A context intentionally fitted for non-structured activities;
- An informal active environment.

Planning the inclusion means investigate and learn through acting and experiencing (de Anna, 2009); hence the nature of the project develops while it’s being carried out, and the elements of self-analysis impacts the planning hypothesis within an itinerary of development of goals, formative contents and competences.

4.Interaction — The theory of active involvement, applied to online learning environments, shows that students learn effectively through the interaction with others. The individual shares the same point of view and acts alike the group he/she belongs to, thanks to stimulating working tasks (Khan, 2003).

This suggests that between the components of an online learning environment, the electronic tools for communication, such as forums, offer multiple points of view that help develop cognitive flexibility and

represent a space of shared knowledge, enhancing its dialog power.

To create an inclusive didactic environment through multimedia tools, it is important to know and let everybody know how to interact in a virtual classroom, in consideration of all other aspects such as learning, cognitive styles, intelligence quality, self-efficiency and motivation. An online forum hence represents an environment where the individuals involved can observe themselves and the others confront with the others and with their points of view (Albanese and Martin, 2006). Everyone can share his/her point of view and express it openly. In this way the forum can be a valid educational and formative tool, not only on an informational level, but in particular to create interrelationships with others, thanks to the usability.

Results and Future Trends

As our analysis was carried out on a sample of selected candidates based on the attendance of the proposed formative paths, it was possible to gather information about the quality and efficacy of the formative paths themselves. Their innovative nature was highlighted by a high customer satisfaction level that provided useful elements to assess medium and long term perspectives, and helped identify the actions that can lead to further developments that can be perceived and appreciated by the students.

In regards to the qualitative analysis of the results we have noticed the following:

- A productive and integrated connection between special education and multimedia can offer better organizational tools in an online learning environment, and can help everybody develop their potentials, intuitions, needs, hypotheses, creativity that wouldn't be possible to develop using traditional didactics.
- It is possible to realize a formative inclusive model of cooperation and learning that is identified as an environment co-projected by the user, in which it is possible to learn, and where complexity is seen as an important element to figure out the knowledge of the world and its learning areas. In

such environment, the key roles are communication, practical exchange of experiences, and the processes of inclusion rather than the products.

• The adoption of open multi-purpose technologies that allow flexible, explorative, social and recreational use of knowledge, and allow an interactive and constructive relation between students and technologies that can favor the inclusive process.

• The e-tutor that is expert on the inclusion processes has to have specific competences to enhance independent learning capacities in every single student, by integrating knowledge and pedagogical and technological competences. He/she has to be able to deal with complexity also within online learning environments.

Thus we have new paradigms that focus on every single student and to his/her way to create his/her conscience actively, through meetings, the knowledge of diversity, a meta-cognitive work, analysis, consideration, organization and elaboration in relation to a specific context.

Conclusions

We can conclude that it is possible to take advantage of the educational potential of the information technologies for the realization of educational inclusive scenarios through the internet if:

1.We use a pedagogical, holistic and global approach that takes into account the needs of each individuals, considered as single elements and as a group, and also as members of a society that should not have limitations and spatial, religious and cultural boundaries (de Anna, 2009; Moliterni, De Stasio, Carboni, 2011);

2.We take into account the accessibility as an access to information for everyone, to tools, resources, but also mainly as a thought of a society that offers everyone a chance to self-fulfillment (Mura, 2011);

3.The set of methods is inter-disciplinary and the structural paradigm

is linked to generative learning and to the social and cultural approach, with an eye to the didactics of inclusion;

4.The learning environment use professionals that help create and spread an efficient system;

5.The professionals are groups of categories, i.e. e-tutors that are expert in the processes of integration and inclusion.

Our goal is to test the use of informal (Colletta, 1996) and interactive training methodology as a way of teaching personal skills and spread the inclusive culture, which are hard to teach with traditional techniques of e-learning. To create attractive, easily usable tools we have also paid great attention to the e-tutor support and pedagogical design time to facilitate the on-line environment for the learning purpose. This experience represents the first attempts to apply on-line inclusive strategies and flexible methodologies to teaching and learning processes in higher education.The experimental model shows a high level of applicability to other kind of university training courses.

On the other hand, we believe it could be a resource to employ within the field of effectiveness university courses management. The idea is to train all students to work with heterogeneous groups in relation to their own several unease areas: university drop-out, peer relationships, teacher/ student relationships and learning difficulties.

As the project goes forwards towards its close, there is no doubt that its impact has been felt throughout the national and international institutions involved. Using technology in an everyday inclusive paradigm means that all individuals have access and this project has widened the option and potential for each individual no matter what his/her expertise in the ICT or pedagogical fields. Both quantitative and qualitative evidence has been indicative of the success of this as an inclusive and progressive initiative.

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