

ICTs and OERs Antigua and Barbuda's Journey An Analysis of ICT Integration and OER Content Development in Antigua and Barbuda

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Abstract

The integration of Information Communication Technology (ICT) and the development of Open Educational Resources (OER) have gained prominence across the Commonwealth Nations. Educators and policy makers have realized the benefit of the ICTs and OERs to facilitate the teaching and learning of students with diverse abilities. Antigua and Barbuda is among the nations in the Commonwealth that have integrated the use of ICTs and the development of OER within the education paradigm to support and facilitate teaching and learning. The initiative began in 2013 with teachers receiving laptops and reduced internet rates. To strengthen the effort, public schools received internet connection and students at the secondary level had the option to acquire a Samsung Tablet with free internet access from 7 am – 7 pm. In the same year, the Ministry of Education sort assistance from UNESCO and the Commonwealth of Learning in the preparation of Antigua and Barbuda ICT in Education Policy to guide the use and implementation of the technology tools and development of OER content to be incorporated by teachers. The purpose of this paper is to provide an insight into the journey by Antigua and Barbuda to integrate the use of ICT's and to develop OER to facilitate and support teaching, within the education system, chronicles both a theoretical/philosophical and socio-economic paradigm. Surveys and interviews with administrators and teachers will be conducted to record their experiences and to journalize the challenges and obstacles, benefits, successes, educators' perceptions of the process and the lessons learned. The journey by Antigua and Barbuda, over the past three years, in its quest to use ICT and develop OERs to ensure access to quality education and the inclusion of all learners, provides significant data in our attempt at implementing best practices. The findings will highlight both challenges and successes that could be beneficiary to other countries undertaking similar initiatives.

Introduction

The integration of Information Communication Technology (ICT) and the development of Open Educational Resources (OER) have gained prominence across the Commonwealth Nations over the past decade. Educators and policy makers have realized the benefits of the ICTs and OERs to facilitate the teaching and learning of students with diverse abilities. By extension, Antigua and Barbuda is among the nations in the Commonwealth that have integrated the use of ICTs and the development of OER within the education paradigm to support and facilitate teaching and learning. This paper serves to chronicles Antigua and Barbuda's journey with the implementation of ICT and the integration and development of OER content resources over the past three years.

The fundamental goal of any education system is to ensure that all its learners are equipped to competently and professionally function in society (Aslan & Reigeluth 2013; Tomlinson 2015). The integration of ICT in the teaching and learning domains allows students to take responsibility for their learning and provide opportunities to analyze information, develop their problem-solving, critical thinking, and communication and collaborative skills necessary to compete in the 21st-century global market (Lim, Zhao, Tondeur, Chai and Tsai, 2013). Additionally, technology integration in the learning domain helps to extend students learning experiences that were not otherwise

achievable without technology tools (Light, 2008). However, to facilitate this change, there needs to be shifts in the roles of teachers, inclusion and access to all learners, resources, and training. Furthermore, a critical factor in the integration process is the preparedness and skills of the users along with the support for an efficient and sustainable integration (Noeth & Volkov, 2004).

A viable, sustainable, and innovative integration necessitate that the learners and educators also need be equipped with the necessary tools and training, proper infrastructure to support the use of technology tools and the policies to guide the process is also crucial. Notably, the success of ICT integration initiatives depends not only on the contextual factors but also the calibration between the context, technology, goals and policies (Light, 2008). Training in the use of instructional strategies and material development is another essential element of any technology integration project. Technology resources such as smartphones, tablets, and laptops offer an alternative approach for learners to interact with people, organizations and other technologies (Light, 2008).

Although the efforts to integrate technology in Antigua and Barbuda dates back to several decades, this paper will focus on the ICT in Education initiatives over the past three years and how each initiative added value to the education product of Antigua and Barbuda and the challenges and benefits experienced. The purpose of this paper is to provide an insight into the journey by Antigua and Barbuda to integrate the use of ICT's and to develop OER to facilitate and support teaching within the education system, chronicles both a theoretical/philosophical and socio-economic paradigm. Questionnaires were distributed and collected from administrators and teachers to record their experiences and to journalize the challenges or obstacles, benefits, successes, educators' perceptions of the process and the lessons learned.

Technology Integration Initiatives

To guide the thrust of ICT in the teaching and learning domain, the Ministry of Education sorted assistance from UNESCO and the Commonwealth of Learning in the preparation of Antigua and Barbuda ICT in Education Policy to guide the use and implementation of the technology tools and development of OER content (Government of Antigua and Barbuda, 2013). The purpose of the policy is to facilitate the process of educational reform and motivating teachers and students to make a shift from the traditional approaches to teaching and learning. The focus of the policy document was to cultivate a more student centred, all-inclusive approach to teaching and learning with the integration of technology. The policy document provided an overall plan and the goals for the integration of technology in the education paradigm. However, the Ministry of Education ICT Master Plan outlines the milestones and agenda to achieve the policy objectives. The initial master plan, which spans over a one year period was developed in October 2013 and provided a more comprehensive and detailed outline of the procurement of resources and the roadmap for the transformation of the education system.

The full thrust of ICT integration advanced in 2013 with the Government Assisted Technology Endeavour (GATE) programme was championed by the Ministry of Information (Government of Antigua and Barbuda, 2012). The programme saw a partnership between the Technology giants Digicel and LIME and the Ministry of Information. The mission of this partnership was to:

1. Reconstruct the learning capacity,
2. Encourage entrepreneurship, and
3. Constitute Antigua and Barbuda as the ICT capital of the Caribbean.

The programme goals were to develop the professional skills of young people, encourage, and motivate their entrepreneurial spirit while preparing them to advance their education at a local, regional or international institution. The GATE project had several components; however, the three had a greater influence on the education system.

First was the ICT Cadet programme where students sixteen years and older who have completed secondary school but were unemployed could receive training in

- Entry level ICT skill set,
- Introductory A+ and Network+ certificate training, and
- Introduction to New Media Training.

The vision of the ICT Cadet programme was that the students would utilize the knowledge and skills to create employment through entrepreneurship ventures. However, the participants were not provided with any recognized certification after completing the programme.

The second component was the Connect Antigua and Barbuda Initiative. The goal of this component of the programme was to make ICT available to the community through the Community Computer Access Centre (CCAC) and the Mobile IT Classrooms. The CCAC was open to the community after school hours and offered classes in:

- Introduction to computers for schools and community,
- Intermediate computing for community, and
- Advanced computing for the community.

During the school day, the students at the school had access to these centres for their introduction to computers classes. In communities where there were no access centres, they had the use of the Mobile IT classrooms to facilitate the training.

The third component, which focused on the education sector, was the e-Education Computer Tablets and e-Education Connectivity. This component forms part the Ministry of Education ICT in Education Master Plan to deploy wireless connectivity in all secondary schools. Under this initiative, sixteen hundred laptops were distributed to public and private school teachers and three thousand tablets to the secondary school students. The Samsung computer tablets issued to the students were enabled with 4G LTE broadband internet connectivity. The free internet on the devices was accessible from 7 am – 7 pm; however, they could also access discounted rates for evenings and weekends. Also, the teachers were offered discounted rates for home internet access. The purpose of these devices was to create a paradigm shift in the education system and transform students learning. To support the use of these devices in teaching and learning, schools received free Wi-Fi access under EDU2020 initiative between the Government and the telecommunication company LIME. However, the use of technology materials should be driven by the educational objectives and learners needs and not by the technology (Olele, 2013). Therefore, for technology to support learning outcomes training and professional development should be sustainable and embedded with firm educational objectives with shared leadership to determine whether the learning goals are realized (Noeth & Volkov 2004).

Training

Another critical component of the GATE initiative was the training of teachers to improve their ICT skills and facilitate the use of these devices in the classroom. Noeth and Volkov (2004), notes that educators should be adequately trained to use technology resources effectively. Hence, under the EDU2020 LIME initiative approximately 150 teachers received training in the Microsoft Suite and technology integration. The goals were to ensure that the teachers were equipped with basic ICT skills to prepare teaching and learning content and resources. Although other professional development training sessions were conducted in the use of online resources for the teaching and learning domain, the use of Open Educational Resources and developing the critical thinking and problems solving skills of learners, EDU2020 was the ICT training component of the GATE project.

In addition to the EDU2020 training, fifty educators enrolled in Commonwealth Certificate for Teacher ICT Integration (CCTI) as a ‘train the trainers’ initiative to facilitate further training of teachers to address the advancement of ICT integration in Antigua and Barbuda. However, only twenty-five educators completed the fifteen months long training. These twenty-five educators were recognized by the Ministry of Education as the ICT champions and were identified as the resources persons to assist with the training of other teachers. They also had the task of mentoring and supporting teachers as they worked towards implementing ICT in their teaching and learning domain. This paper would not be completed without getting some feedback from the teachers who were recipients of the technology tools and training along with the educators who completed the CCTI training. The two groups of educators were issued a survey to provide their feedback and comments on their interaction and observations of technology in the schools of Antigua and Barbuda.

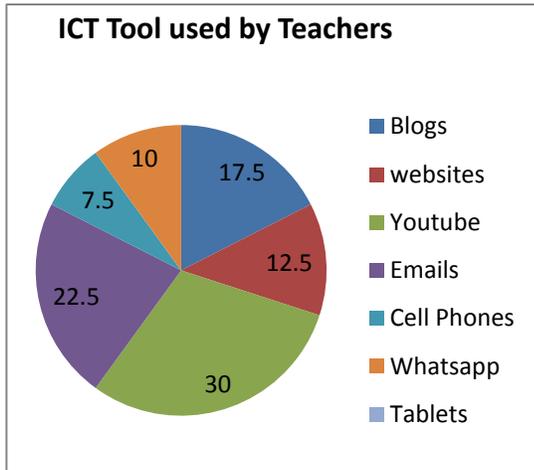
Teachers’ Feedback

A survey was conducted among forty teachers to determine:

- How they incorporated the devices in their teaching?
- What training did they receive?
- The challenges experienced with implementation.
- What were the driving or restraining forces for the use of technology in their lesson?
- How was the content used sourced?

- Knowledge of OER resources.
- How have they used OER resources and their interest in learning about developing Open Education Resources?

To form the basis for assessing the impact of devices, the teachers were asked to indicate if and what type of technology were used before the thrust of technology by the government. Seventy percent (70%) of the respondents reported that they did not use any form of technology before the e-Education initiative was launched. They noted that the only resource used was the textbook and the chalkboard. The other thirty percent (30%) indicated that they



had used devices such as television, projector, and computers before receiving the government issued devices. However, all the teachers' surveyed did suggest that they have subsequent to receiving their laptop used some form technology in the classes. The teachers were provided with a list of ICT tools to indicate what they had used. The results as highlighted in diagram 1 shows that 22.5% of the respondents incorporated the use of emails and 30% utilized YouTube for teaching and learning. However, although the students were issued tablets none of the teachers indicated that the tablets were incorporated into their teaching and learning.

In diagram 1, the respondents were required to indicate what were the driving and restraining factors for their use of technology in their teaching and learning?

Diagram 1 – ICT Tools used by Teachers

Diagram 2.0 indicates that thirty of the forty teachers (75%) responded that training and their expertise drove their use of technology and twenty-five (62.5%) suggested that the availability of online access influenced their use of technology in the classes. However, these same two factors were highlighted as restraining factors towards the use of technology since their lack of confidence in the ICT skills and poor internet access do not motivate the utilization of these resources. It must also be noted that the lack of proper electrical outlets and access to projectors was also highlighted as restraining force in the used of ICT tools in the classrooms.

A survey of the teachers' knowledge and use of Open Education Resources indicated that there is some knowledge of Open Educational Resources but only 20% of the respondents indicated using OER resources. The teachers defined OER as online material that can be copied or changed with or without permission; resources shared amongst individuals; resources on the internet available for usage and free resources available to all online. Others admitted that they had very little knowledge of Open Educational Resources. However, all forty respondents indicated an interest in learning about Open Educational Resources.

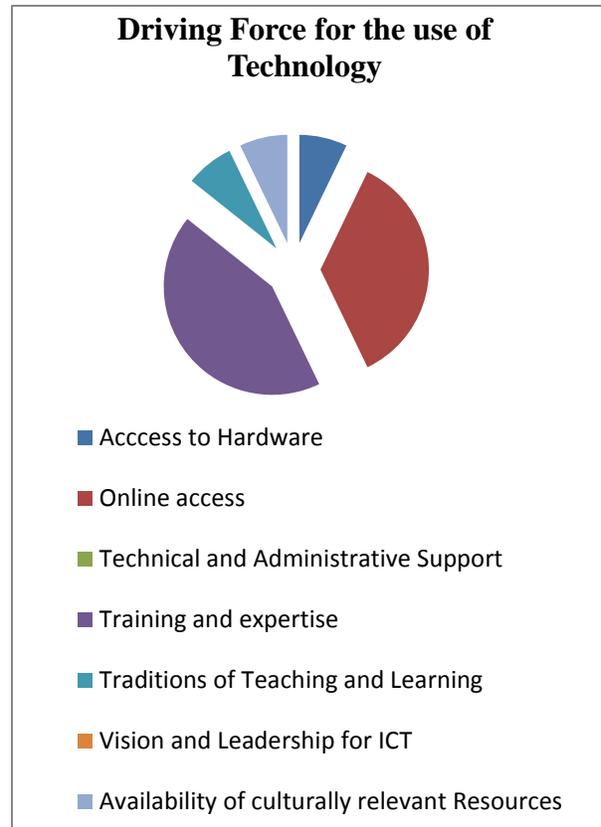


Diagram 2.0 – Driving force for the use of Technology

CCTI Initiative

The twenty-five teachers who completed the CCTI training were also invited to report on:

- How have they utilized their training?
- The benefits of ICT integration in the education system of Antigua and Barbuda.
- The challenges experienced with the integration of ICT.
- Changes observed with the incorporation of ICT in the Education System over the past two years.
- How has their training impacted/influenced the changes observed?
- Other areas of training that are necessary for the improvement ICT integration in our system.

The ICT champions report that they have utilized the skills and knowledge gained from the CCTI to facilitate the training of other educators in and out of the classrooms; improve their professional practice as educators, and in the teaching of their various disciplines in the schools. They also noted that the training received help to foster more communication, collaboration, critical thinking and independent study. Additionally, it was pointed out that they had developed a practice of using the available technology resources to encourage and motivate active, positive, and efficient educate their students.

As ICT champions one of this team's responsibility is to mentor, motivate, observe and support others in the implementation of technology. They recorded that teacher's confidence in the use and integration of ICT has improved; others noted that although there is still room for improvement the use of technology in the teaching of literacy has resulted in some improvements due to more innovations and motivation to learn. However, some of the educators also highlighted that there is still resistance by students and teachers to embrace and use the technology. The resistance and inadequate infrastructure was reported as the major challenges in their efforts to advance the use of technology.

From observations and interaction with fellow colleagues, the educators have identified other possible areas for improvement ICT integration as:

- Academic writing and research skills of teachers;
- Using ICT to improve inclusive education;
- Using technology to improve education innovations;
- Designing and implementing online or blended class and the implementation of online instruction in the teaching and learning environment.

Open Educational Resources Projects

Antigua and Barbuda also embarked on the development of Open Educational Resources to motivate and encourage using and developing culturally relevant OER content. The Ministry of Education sorted assistance from the Commonwealth of Learning to facilitate the training of educators in the identification and development of OER content. One of the first OER projects undertaken by Antigua and Barbuda was the development of a Mathematics repository. During this project Mathematics teachers search the Internet for OER content that aligned with the objectives of the Mathematics curriculum at the various levels within the education system. The Mastering Mathematics series from the then Mathematics coordinator was also added to the repository.

Improving teaching and learning through the use of Open Textbook, Antigua - Barbuda has received support from the Commonwealth of Learning (COL), which began in March 2016. The project focused on the development of an Open Education Resource Textbook based on the CAPE Entrepreneurship curriculum over a three-year period.

The aims of the project are:

- The developments of Entrepreneurship open educational course and materials to be relevant to the Organization of the Eastern Caribbean States (OECS) territories.
- Provision of a self-paced course for in-service and aspiring entrepreneurs to build their knowledge and mindset of the essentials for business ownership.
- Equipping individuals with the skills and knowledge necessary to launch and operate a viable business venture with the OECS economic countries.

- Preparation for students sitting CXC Cape Entrepreneurship.
- Develop an understanding of Open Educational Resources (OER)
- Promote the use of OERs
- Build capacity to search and develop OER content that is relevant to the OECS

Today, twenty teachers have received training in identifying and creating OER content under this project. Although the supported received from COL focused on the development of content for the CAPE Entrepreneurship, eight other subject disciplines also participated in the training with the subject groups developing open textbooks in their area. These groups are aiming at a June 2017 date to complete their open textbooks in following disciplines:

Spanish	Language Arts	Science	ICT
Economics	Geography	Office Administration	
Principles of Business			

Conclusion

To determine how the use of technology in the classroom achieved its goals requires looking at the implementation of the technology in context and understanding how the classroom organization mediates it, and the pedagogical methods of the teacher (Light, 2008). One of the greatest challenges in compiling this chronicle is the locating and accessing information and reports of the various ICT initiatives undertaken in Antigua and Barbuda. It was also noted that there was no recorded evaluation of these projects. Clearly, documentation is a gap that needs to be addressed when such significant investments are made and also evaluation to determine the challenges, benefits and the way forward for technology in education for Antigua and Barbuda. Another notable fact from preparing this paper is the changes that transpired in the original designed of the various initiatives highlighted. These changes could be attributed to the change in the governing administration with different policy directives, goals, and objectives for the implementation and use of ICT in the education paradigm

A new ICT initiative for the Ministry of Education is the issue of tablets for the student since the students who received the first set of the tablet were allowed to keep the devices. However, this new issue will issued equipped with the textbooks for the twenty subject disciplines unlike the first set of Samsung tablets. The goal of this new initiative is to cut the cost for the purchase of textbooks and making the content necessary for teaching and learning readily for the students on their device. This new issue of tablets is scheduled to be distributed early in the 2016/17 academic year.

Clearly, a lesson to be learnt from Antigua and Barbuda ICT initiative is that there should be a shared vision with all stakeholders; the technology should encourage and motivate innovation to ensure an all-inclusive system for all learners no matter their learning abilities or disabilities. Additionally, proper records and documentation is critical for the evaluation of these projects and to determine the benefits and whether a return of the investments was realized. Ensuring that the users of the technology are equipped and trained in the effective use and implementation is crucial to the success and sustainability of any ICT initiatives. Another critical lesson from this journey is that technology resources should be sufficient and accessible to achieve the learning goals (Noeth & Volkov, 2004).

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