Using IT Education to Reveal New Horizons
A Large Scale Case Study on Digital and Social Inclusion

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Keywords: Digital and Social Inclusion, Technical Studies, Information Technology, e-Learning.

Abstract: The development and the economical growth of a State in the sectors of Industry, Commerce (and e-Commerce), and services are directly influenced by the investments on Information and Communication Technologies (ICTs). Emergent countries like Brazil have an extremely large deficit in qualified ICTs employees. Furthermore, despite being the 6th economy in the world, Brazil currently still presents a large number of citizens below the poverty line even after a considerable improvement in recent years. In 2006, the Federal University of Rio Grande do Norte (UFRN), developed the Digital Metropolis project, whose main objective is to provide means for the creation of a ICT Development Environment in Rio Grande do Norte, Brazil. Currently, the project's main supporting activity is the Technical Course on Information Technology. In this paper, we describe the activities involving this course, its results and difficulties so far, and the future challenges we aim to face in a very near future.

1 INTRODUCTION

The development and the economical growth of a State in the sectors of Industry, Commerce (and e-Commerce), and services are directly influenced by the investments on Information and Communication Technologies (ICTs). Using the infra-structure provided by such technologies, a local environment is able to obtain the same technical results in a more efficient manner making it much more competitive in today's globalised economy. Hence, reducing the production and commercialisation costs highly depends on a larger use of ICTs. This infra-structure is composed by two important components: equipments and stakeholders. First, desktop computers, servers, computer programs and services, network and internet access are imperative resources to organisations of all sectors. Nevertheless, these resources are only useful if qualified people exist for both projecting, installing and maintaining these resources, and using them at the final end of the process.

Most of the emergent countries like Brazil have an extremely large deficit in qualified ICTs employees. Recently, an study conducted by Softex Brazil (Softex, 2010) projected a scenario in which this deficit increases considerably from 70,000 open jobs in 2010 up to something between 140,000 and 200,000 open jobs at the end of 2013. If these projections are confirmed, all economic sectors in Brazil will have their competitiveness deeply affected since, nowadays, ICTs are transversal to all productive sectors.

Despite being the 6th economy in the world, Brazil currently still presents a large number of citizens below the poverty line even after a considerable improvement in recent years. In recent research published in (IBGE, 2010), the Brazilian Institute for Geography and Statistics (IBGE), indicated that 16,27 million (8,5%) Brazilian citizens live in extreme poverty. Furthermore, current Educational Indexes like the IDEB (INEP, 2012) presented a considerable improvement (from 3.8 to 5.0 in the last seven years), but are still far from indexes considered acceptable for a developed country. More specifically, in Rio Grande do Norte, the index has been historically below the national average (from 2.7 in 2005 to 4.1 in 2012).

In this context, the Federal University of Rio Grande do Norte (UFRN) developed the Digital Metropolis project in 2006 with the support of local and national government. The project's main objec-

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Using IT Education to Reveal New Horizons - A Large Scale Case Study on Digital and Social Inclusion.
DOI: 10.5220/0004344606030611
In *Proceedings of the 5th International Conference on Computer Supported Education* (CSEDU-2013), pages 603-611
ISBN: 978-989-8565-53-2

tive is to provide means for the creation of an ICT Development Environment in Rio Grande do Norte, Brazil. In this process, it is imperative to contribute with the formation on ICT of qualified individuals that will reduce the lack of employees previously described. The Digital Metropolis embraces this cause but adds to it a strong sense of social and digital inclusion: the project's main supporting activity to date is the Course on Information Technology whose 70% of students (ageing between 15 and 19) are from public schools.

In this paper, we describe the Course on Information Technology of the Digital Metropolis, which aims at providing professionals with high qualification in ICT whilst promoting social and digital inclusion. For that, our courses have a large scale approach in which over 2,400 students have been accepted in the last two years. In 2013 alone, this is the number of students that will be starting the course, hence, resulting in 4,800 admissions in the last 4 years.

This paper is structured as follows. In Section 2 we present an overview of the project as a means to contextualise the Course on Information Technology, which constitutes the main focus of this paper. The course's history and detailed description are presented in Sections 3 and 4, respectively. Among the course details, we describe the instrument of selection of talents (prospection), the structure of the course, its execution mode, the didactic material, the student's evaluation, and some statistics on the course's execution. The Section 5 describes the initiative of our Institute to stimulate our students to keep their intellectual development by either taking one of our BSc courses as their next academic steps, or by innovating on idealised products on a project incubation. Finally, we draw our conclusions and discuss future work in Section 6.

2 THE SUPPORTING AXIS OF THE DIGITAL METROPOLIS INSTITUTE

The Digital Metropolis was founded with the mission of promoting the interaction University-Society by complementing its functions in the axis of Education, Research and Extension on ICTs. This integration takes place in partnerships with the public, private and service sectors of society and involves various Academic Departments of the UFRN, each of which contributes with the different knowledge areas of the project. This approach favours the multi-disciplinary aspects of the Institute since, besides technological aspects, social and human factors are also considered within the project.

In the Educational axis, our mission is characterised by initiatives that promotes the formation of qualified IT professionals at various levels: from technical courses up to post-graduates. At the technical level, our objective is to stimulate vocational IT skills in teenagers aging from 15 to 18 years[1], always keeping the social and digital inclusion in context. As such, 70% of our students of the technical course are from public schools from all over the State. In the higher education, the Digital Metropolis is also innovating by creating the BSc on Information Technology and the BSc on Software Engineering. The former will start in 2013 and the later has started in 2011 and will be incorporated to our Institute as from 2013. Both courses will run in our future physical installations and aim at forming differentiated professional that are capable of taking important roles in local IT companies and endeavor in startups in the ever-growing ICT market.

In the Research axis, the Digital Metropolis aims at broading out the natural vocation of the UFRN in scientific development and technological innovation through a direct integration with private and public companies driving the practical application of research results and the technology transfer. Our objective in a near future is to establish partnerships that promote the implantation of a technological center in Natal, Rio Grande do Norte. On the other hand, this interaction will also allow the University to become aware of the real problems in society that demand high skilled research.

Finally, in the Extension axis of the project, our mission is to foster the entrepreneur vocation in the young members of the project. In that sense, the Digital Metropolis support start-ups initiatives based on innovative projects. By creating and supporting such environment, we foster the inclusion of the students of the project both from the technical courses and higher education in real life projects.

The existing synergy of UFRN and society on the three supporting axis of the project has been the key of the project's success so far. By qualifying students and integrating them with local ICT companies as well as stimulating them to open their own start-ups, we make it a real possibility to transform the State's current economical and social profile.

[1] As described latter in this paper, in 2013, this will range from 15 to 20 years old; furthermore, we will also offer the course for students above 20 years old

3 HISTORIC OVERVIEW

The Technical Courses of the Digital Metropolis Institute started on March, 2009, with the first group of 1195 students. This first course had a duration of 15 months and its curricular structure was the basis of our current structure described in Section 4. In June, 2011, the first group of 407 students successfully finished the course. The success rate was a good indicative since our 34% success rate was well above the national average rate of 18% (Soares, 2011).

Currently, we are running the second group of students, which also started with 1200 students aging from 15 to 18 years. However, in its current three-semesters structure discussed in the next Section, the course became a Technical Course with three possible specialities: Technician in Web Programming, Technician in Computer Networks, and Technician in Electronics.

In both occasions, the execution mode of the course was online, but with weekly interventions of tutors that follow the students throughout the course. Nevertheless, as expected, our experience with the first group of students allowed us to apply changes to the daily operational execution of the course that resulted in the structure presented in the next section.

4 THE TECHNICAL COURSE OF THE DIGITAL METROPOLIS INSTITUTE

The technical courses of the Digital Metropolis Institute aim to attract young talents to the area of ICTs as a means to promote the establishment of an excellence center in this area. In this context, currently, the Institute offers three specialities in the technical courses: web programming, computer networks, and electronic. As we detail later in this section, all courses are executed with online material and weekly physical meetings. They have been prepared in a process of appropriation and production of state-of-the-art knowledge on ICTs and may contribute to the preparation of high-skilled professionals throughout Natal, helping the city to become an excellence center on ICTs.

Our technical courses target local students between 15 e 18 years old, which fit the profile of ICTs skills. In summary, during these courses the students learn basic mathematical notions, which are necessary for programming, general concepts on computational systems like operating systems and computer architectures, and programming (for the web, computer networks, or electronic circuits - depending on the specialisation). Besides the technical knowledge, students also learn to deal with technical material written in English. Finally, at the end of the course, students are motivated to undertake specialised courses and to integrate with local companies as junior programmers. At the end of these courses, our students are able to smoothly integrate into a working environment on ICTs broadening the horizons of their professional careers.

4.1 Course Structure

The courses are organized in three modules: basic module, advanced module and integration module. Each of these modules have a duration of approximately six months with a 400 hours class load. The first module (basic) aims to introduce the students to the area of ICTs and programming. Furthermore, it also offers material on technical English. During the six months of the basic module, the students take 9 subjects presented in Figure 1, which involve an Introduction to Information Technologies, Technical English, Computer Systems, and Basic Programming.

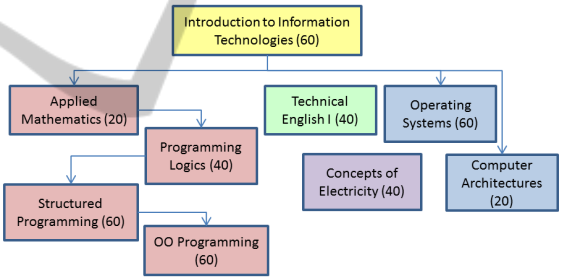

Figure 1: Basic Module Structure.

Once finished with the basic module, the student is allowed to ingress in the second phase of the course, the advanced module, in which we aim to offer a more specific knowledge to the students. Hence, when subscribing to this module, the students are asked to choose one of the three specialities of the technical course: web programming, computer networks, or electronics. Overall, during the six months of the advanced module, the students have a 400 hours class load that are divided into the subjects according to its choice as presented in Figure 2. In this module, the students of all specialities have an extended formation in technical English. Furthermore, students of web programming and computer networks study further programming and databases. After that, web programming students have a specialising training on web programming, which includes programming for mobile devices. The students of computer networks specialize in network infra-structure and security. Fi-

nally, the students of Electronics have subjects on electronic circuits, micro-controllers, radio-frequency systems, and integrated circuits prototyping.

The final module of the technical courses aims at providing an integration between academia and industry. In this module, students are able to undertake more specialised courses provided by local and national companies, which enable them to acquire more specific knowledge required by these companies. The courses also work as a link between the students and the companies that offers them, which are able to recruit the students with a more detailed analysis of the candidates skills. In our Institute, students are in constant contact with the Institute's start-up incubator. Hence, entrepreneurship is a further possibility of our egress students.

4.2 Running the Courses

All our technical courses are distance semi-attending courses. This modality allows both a concomitant execution with their standard school courses and, more importantly, a large scale offer of the courses. Currently, we offer 1200 vacancies. In 2013, this number will increase to 2400 vacancies with the plans described in Section 6.

The students are divided into groups of 40 students which happen synchronously. Each of these classes are allocated to a tutor, whose job is to follow the students throughout the whole module. Due to this nature of tutoring, the tutors are required to have a strong background on the module's subjects. In our experience, most of the tutors are students of one of our post-graduate programmes.

The tutors interact with their students both on-site and virtually. The on-site weekly meetings take place in the university. Each group of students has a 4 hours meeting per week with a fixed schedule. Overall, the meetings happen from monday to saturday in the three periods of the day. This broad availability of choices makes it possible for us to offer the course to the most number of students. The tutors use these 4 hours meetings to present a resume of the week's subjects and to answer any questions that the students have regarding the week's subjects. At the end of the meetings, students are asked to complete exercises on the week's subjects. Most of these exercises have a practical nature as they require the students to practice the theory they have learnt online. For instance, in the programming related disciplines, the students are mostly asked to provide programs that solve certain problems. The answers of these exercises are used to compose the student's final mark as described in Section 4.3. Furthermore, during the meetings the students engage on discussions about non-technical subjects on ICTs. These discussions foster their interest in the area by providing a broader non-technical view on the area.

During a module execution, the disciplines are executed sequentially. Every week, the students are in touch with 2 or 3 subjects. For each of these subjects, the students are given 1 to 3 lectures, each of which correspond to a 4 hours class load. Hence, weekly, the students are asked to study between 4 to 6 lectures (16 hours to 24 hours class load). Each of these lectures are available to the students in our Moodle based online learning environment. They have been elaborated by Lecturers of our Institution, all of which are post-graduated (PhD) in the subject of the material they have been assigned for, as we describe in Section 4.5. Besides the online lectures the students are also given the opportunity to interact with their tutors in the virtual classes that also happen in the online learning environment.

As a means to facilitate the access to both material and online exercises, the Institute offers access points to all students throughout the week. Furthermore, every student is given a media that contains all the material of the current module in execution. Hence, the student is given various opportunities to access the courses helping them to keep in touch with their classes execution.

4.3 Keep Tracking of the Student's Evolution

During the course, the students are continuously evaluated. This is enforced by the final composition of the module's grade that we explain in the sequel. For each subject, the student is graded based on three components: participation (25%), on-line exercises (25%), and the final exam (50%). The subject's final grade is the weighted average of these three components.

The participation includes both virtual and on-site activities of the student. For the virtual participation grade, we developed a tool that automatically analyses the log of the virtual learning environment and produces a weekly-based grade for each student. Among the activities that are considered in this analysis we have number of logins, time dedicated online, participation in forums, and exercises. For each one of these components, students that are above the component's threshold are given the maximum grade. Students that are below the threshold receive the grade proportionally. For instance, the time dedicated online threshold is 16 hours per week. Students above this time receive a mark 10 (ranging from 0 to 10); a student that dedicated 8 hours would receive a mark

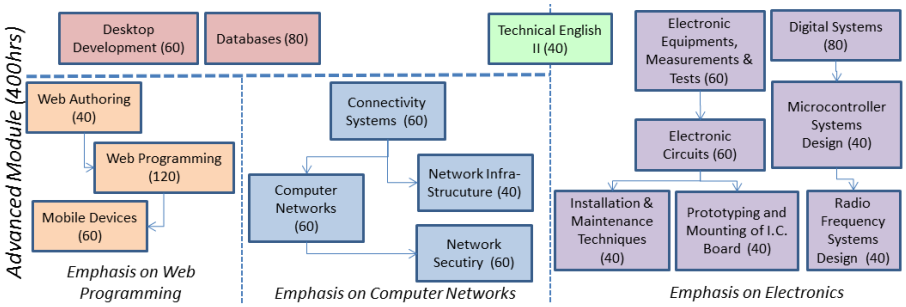

Figure 2: Advanced Module Structure.

5 on the corresponding week. The final grade of the online participation is automatically calculated by the tool; it is the weighted average of the components of interest in the log. The on-site participation is graded by the tutor and takes into consideration the participation of the students during the weekly meeting and the students results in the list of exercises given at the end of each on-site meeting.

The second component of the final grade of each subject corresponds to the student's on-line exercises. For each 4 hours lectures that is made available in the virtual learning environment, the student is asked to answer 5 exercises. Hence, overall, besides the exercises of the weekly on-site meetings, the students have a load of exercises that range from 20 to 30 exercises. Most of the exercises have a practical nature as they require the solution of practical problems. The style of these questions range from multiple choice to open questions. In case of multiple choice questions, the correction of the exercises is done automatically by the virtual environment. The remainder of the exercises is graded by the student's tutors.

The last part of the subject's grade is the subject final exam. This exam is applied twice per module, each of which corresponds to a different group of subjects of the module. Each 4 hours of class load of the subject corresponds to one question of the final exam. For example, a 40 hours class load subject contains 10 questions in the final exam. The nature of these questions is the same as that of the exercises presented to the students during the weekly meetings and in the online exercises.

Based on the three components discussed above, the student receives a final grade in each subject. The students final performance in the module, however, is given as the weighted average of the grades of all subjects of the module, where the weight of each discipline corresponds to its class load. The students with a final module average above 5.0 are approved in the module and qualify to the next module. The students that fail to achieve this mark are given a second opportunity: they are allowed to take a second final exam. After this second exam, the final grade of the module is recalculate. The same requirements for approval apply to this very final mark. Students that fail again to achieve the threshold of 5.0 after the very final exam are excluded from the program, but may take part in the entrance examination again. As the integration module is composed only by activities, this is valid only for the basic module and the advanced module.

When the basic module is finished, the approved students are given the choice of the emphasis of the advanced module. Since some of the emphasis have a limited number of places due to physical limitations, we give the priority of choice to those students with better final grade in the basic module. Every student, however, is allocated to some class in the advanced module. In cases in which the student's choice for the advanced module is not available, he is allocated to another emphasis. The grading of the advanced module is very similar to that of the basic module.

During the modules execution, a thorough follow-through of the students participation in the course is made. This is achieved by a continuous analysis of the student's participation and exercises, which allows us to identify students that have a performance below average. In such cases, we invite this students to personal meetings with the team of social assistance of the Institute. Based on these meetings, we identify the student's needs and accommodate our resources in order to solve the issues. In some few cases, this also involved the Psychology team of the Institute.

4.4 Prospection of Talents

The evaluation tool used in the selection of candidates willing to access the technical courses of our Institute was composed by 30 multiple choice questions, each question having only one correct option among five possible choices. This evaluation tool was supposed to cover a set of abilities and competencies considered critical for an IT formation and career, and was based on a certain number of assump-

tions related to this operational target of selection. These abilities and competencies are seen as structural modalities of intelligence, necessary in pragmatic, situated knowing, having variable degrees of complexity. In other words, the instrument was not focused in formal-conceptual, informational school-like aspects of knowledge, covering instead strategies of data analysis in the context of problem-solving procedures and differing from traditional school evaluation instruments (Primi, 2003). So, the assessment contemplated the expertise described in the National Curricular Parameters (NCP) (Educacional, 2012) in some of specific knowledge areas, particularly in the domain of languages, coding and their technologies (2000), which is more promptly associated with the identification of talents and skill building in ICTs.

For example, the assessment was composed by questions of exploration of the familiarity of the students with the following skills:

- "Understand and use the symbolic systems of different languages as a means for cognitive organisation of the reality by the constitution of meanings, expression, communication ann information¨ (NCP, 2000, p. 6)"
- "Analyse, interpret, and apply the expressive resources of the languages, relating texts to their contexts, by the aid of their nature, function, organisation of manifestation, in accordance with the conditions of production and reception (NCP, 2000, p. 8)"

We understand this paradigm of assessment appraises the high levels scholar skills, which are fundamental to a better performance in the technical courses of our Institute. Additionally, this might provide an incentive for schools on our state to adopt the NCP, enhancing the aggregated value of our proposal. On the other hand, despite the need and importance of defining a paradigm for the assessment, the orientation around the NCP was not enough for building the intended selection mechanism, mainly because the NCP do not deal directly with professional formation, and even less when dealing with ICTs. The assessment also needed to ensure that the selected students had an indicator of talent in specific areas such as computer programming, for example. The assessment incorporated an investigation of the students skills and vocations related to ICTs, even in an emerging state, as a means for amplifying their success in the courses of the institute and, consequently, attending our targets of providing the students with a high degree of ICTs formation and capability of getting a job after the courses.

The process of assembling the evaluation instrument mentioned above was based firstly on the proposition of a limited set of competencies and abilities demanded by environments and situations related to IT (stage 1); once these competencies and abilities were established, stage 2 was characterised by the decomposition of these competencies and abilities in smaller units allowing the proposition of descriptors over which specific items could be proposed (stage 3); the set of items constituting the complete evaluation tool was then applied to the group of candidates (stage 4), allowing finally to the constitution of the selected group of students entering in our courses (stage 5).

In this direction, we have elaborated an evaluation instrument oriented by: (1) on the paradigm side, the investigation of the skills every student should develop in the areas of languages, coding and their technologies, and; (2) on the pragmatic side, the investigation of talents directly associated with the skills and vocations of ICTs. Below, we list the set of talents, vocations and skills that deal with this pragmatic aspect of the assessment, which were inspired by the indicators of the International Society for Technology in Education (ISTE)[2].

1. Creativity and Innovation
   (a) Apply knowledge in the construction of new ideas, products and processes.
   (b) Use models and simulations to explore systems and complex situations.
   (c) Identify trends and foresee possibilities.
2. Communication and Collaboration
   (a) Communicate ideas through diversified ways of registering.
   (b) Develop an appreciation and understanding of different cultures.
   (c) Contribute to the assemblage of situations and times capable of solving problems and producing original works.
3. Research and Information Management
   (a) Localise, organise, analyse, evaluate, synthesise, and ethically use information from diversified sources and medias.
   (b) Evaluate and select information sources and digital artifacts appropriated for specific tasks.
4. Critical Thought, Problem Solving and Decision Making.
   (a) Identify and define authentic problems and significant questions for investigation.
   (b) Collect and analyse data aiming at making decisions in specific situations.

[2]https://www.iste.org/

(c) Use multiples processes and diversified perspectives as a means for exploring alternative solutions for non-canonical problems.

5. Concepts and Procedures in Technology
   (a) Comprehend the use of information systems.
   (b) Effectively and productively select applications and platforms.
   (c) Apply knowledge in the creative use of new technologies.

This structure aimed at maximising chances of selecting students who would stay longer and be more successful in our courses, since they would already have at least a few of the skills and a sense of the digital culture we wanted to develop. Furthermore, the assessment questions blended content and contexts of digital media, drawing very explicitly on students' common-sensical knowledge of IT.

4.5 Digital Material

The didactic material of our courses have been elaborated by a team of over 30 PhD lectures of the UFRN, each of which was supported by an assistant (normally post-graduate students). Furthermore, the unprocessed material went through a thorough revision process that included: grammatical revision, analysis of the language use in accordance to distance learning standards, accordance with rules of the Brazilian Association of Technical Rules (ABNT)[3], and a diagrammatic edition that made the final material more accessible and attractive for the students. Overall, the whole process of creation, revision, and edition of the didactic material involved a group of over 60 people.

In total, our portfolio includes 320 lectures and 3200 exercises on all disciplines discussed in Section 4, each of which corresponds to 4 hours class load of one discipline. This material is available to all students in the virtual learning environment. In Figure 3, we present a sample of the material as presented to the students.

4.6 Current Results

In 2010, the entrance examination had a number of 7000 candidates for an offer of 1200 vacancies in the course (rate of 5.83). This number considered increased in 2011, when we had a number of 13500 for an offer of 1200 vacancies (rate of 11.25). This year, as we will describe in Section 6, we considerably increased the number of vacancies and geographically distributed the course throughout the State. In 2012, the number of candidates stabilised in 13300 candidates, but now we offer 2400 vacancies in the course, bringing down the acceptance rate to around 5 (5.54).

So far, only students from 2010 have completed the basic and advanced modules with an acceptance rate of 34% (407 students), well above the national average of 18%. Interestingly, the rate of students according to the sector of their schools (either public or private), which was 70-30 at the beginning of the course (see Section 1), proved to stay almost constant in the group of graduated students. In the end of the course, this rate was of 67-33. This was a strong indication of the success of the instrument used in the prospection of talents.

Initially, the course was planned to be a basic formation course. Nevertheless, during the execution of the first version of the course, we identified its potential to become a course that offered a technical degree to its graduated students. The students of 2010 that completed both modules have been given the opportunity to re-ingress the course along with the students of 2012. A total of 269 students (67% of the graduated students) started the new version of the course which offers the technical degree. From those, 140 (52%) are finishing the missing disciplines which entitles them to start the integration module. From the group of 1200 students that started the course in 2012, 517 (43%) students have concluded the basic module and are currently in the advanced module.

The number of students that are currently trainees in local companies is considerably high (over 50), specially considering that they have not yet started the advanced module. Their performance in these activities will be the object of study in the next months.

5 A STEP TOWARDS GRADUATION (AND POST-GRADUATION)

Besides providing our students with a technical course that provides them with skills on ICTs, the course presented here aims at attracting these students to the area and open their horizons. Among the options for their near future, throughout the course, we stimulate both (non-excluding) innovation-based entrepreneurship and graduation. For that, our institute provides both a start-up incubator and undergraduation courses. Among these courses we highlight the recently created 3 years long bachelor's degree on Information Technology (BIT), which entitles the graduated students to automatically choose to follow-up on a second graduation on either Computer

[3] http://www.abnt.org.br/

Figure 3: Sample of the Online Didactic Material.

Science or Software Engineering courses. From 2014, the BIT will receive the best students of our technical courses, broadening the possibilities of our students.

Yet another initiative that we will start from 2013 is the ICTs Olympics Competition for students aging below 15 years. This competition will cover the whole of our State and enable students to have a first contact with ICTs. From 2014, our technical courses will provide free seats for the best students of this competition.

Hence, by implementing these two initiatives which are currently under development, we will considerably broaden the public of our Institute and, more importantly, provide all students of our state with new horizons, starting from the middle school, towards graduation.

6 CONCLUSIONS AND FUTURE OF THE COURSE

Despite the good results reached so far, the road ahead of us has still a considerable number of challenges. We have already started dealing with some of them. For example, in 2013, we will start to spread the course (originally executed only with the capital of our State, Natal) to the whole of the State. Next year, three new cities will be offering the course in the same *modus operandi* as the one offered in Natal. They are Angicos (170 Km), Mossoró (272 Km), and Caicó (277 Km), which cover the main economical regions of our State.

The course's expansion has not only be geographical, but also in numbers and age groups. First, from 2013, the Institute will offer 2400 vacancies spread in the 4 cities in which the courses will be executed. Although doubling the current number of vacancies, we aim to keep this expansion in order to achieve our target of 5000 students by 2015. Yet another expansion is regarding the age group: from 2013 we expanded the age of the core group of students which will range from 15 to 20 years. Furthermore, students aging above 20 years will also be offered 20% of the vacancies.

A third dimension if the course's expansion in 2013 is the list of possible emphasis in the advanced module. In 2013, the course will also offer the emphasis on Industrial Automation in the advanced module. Furthermore, we are currently working on the creation of the emphasis on Digital Games that will be included in the list of emphasis in 2014.

Another important challenge is regarding the course's digital material. Currently, due to the already difficult challenges and innovation of making the course as it is happen, the vast majority of the digital material is not interactive. We are currently running a thorough revision on the whole material in order to include more interactivity to it. This revision will expand the current material with screencasts, animations, and interactive exercises. Furthermore, a further revision to the whole course is planned by 2015. In this second revision we aim to provide the possibility of a *progress-as-you-learn* courses like

those provided by Coursera [4].

We are also facing the challenge of consolidating the integration module. Although we have already established important partnership with local companies and with international companies like IBM, we still need to consolidate this module and systematise the follow-up of the students. Currently, we are expanding our contacts with local and national companies in order either broaden the number of courses offered in the integration module or to attract these companies to the Institute. Furthermore, we are implementing a system that will systematise the student's follow-up in order to provide important information that will help the management of the large number of students in this module.

We are strongly confident of the success of our initiative. Mainly, the results reached so far have strengthen this confidence. In a near future, we expect these results will directly affect our State's economy and completely change the current horizons of our students by using ICTs and a means for that.

ACKNOWLEDGEMENTS

We are extremely grateful to the whole team of the Institute without which it would be impossible to achieve the results. Mainly, the office staff, the lectures involved in the creation of the material and the edition team, the tutors who have a more near contact with the students, and the team that provides support to the virtual environment. Furthermore, the financial support of the Ministry of Education and Ministry of Science, Technology and Innovation has been a bedrock of our programm. We are also grateful to Luciano Meira who has participated as a consultant in the elaboration of the students evaluation instrument.

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