THE ROLE OF EDUCATIONAL LEADERSHIP ON PARTICIPATION IN THE NATIONAL PROGRAM OF SCIENCE AND TECHNOLOGY FAIRS OF COSTA RICA

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Abstract

The 21st century has ushered in an era of globalization that has significantly influenced economy and education in many nations. Recognizing the effects of globalization on education and the economy has caused many nations to reexamine their education system and resulted in a positive perceived value of education. Costa Rica has blossomed under the effects of globalization. To compete in a 21st-century knowledge-based economy, the Ministry of Education (MEP) requires all Costa Rican schools to participate in the National Program of Science and Technology Fair (PRONAFECYT). However, not all schools are participating successfully. This study examined (a) the roles and leadership practices of school directors in Costa Rica in implementing the PRONAFECYT initiative, (b) teacher practices at successful schools as measured by participation in the PRONAFECYT, preparation by site and system leaders to equip students with 21st-century skills necessary to participate in the PRONAFECYT, and (d) the influence of participation in the PRONAFECYT on instructional practice. The research team visited 18 schools and administered surveys, interviews, and observations with school leaders, teachers, students, parents, political leaders, government officials, and higher education personnel. This case study focused on one school. Findings suggested that (a) school leaders play a significant role in implementing the PRONAFECYT at the school site level, (b) the target school participates in the PRONAFECYT because teachers focus on the purpose of the PRONAFECYT and include parents in the initiative, (c) Costa Rica does not have a specified budget for the PRONAFECYT nor does the MEP offer adequate training to teachers and school directors regarding how to implement the PRONAFECYT, and (d) PRONAFECYT projects are done in the classroom and 21st-century survival skills are prevalent in instruction. The study emphasizes the need for Costa Rica to create a department within the MEP only for the PRONAFECYT initiative and to achieve regularity and cohesiveness within these government agencies when training teachers and school leaders regarding implementation of the PRONAFECYT initiative.

Keywords: Innovation, technology, globalization, leadership.

1 INTRODUCTION

The 21st century has ushered in a new era of globalization. This new phase of globalization is one that is not spread through countries but rather sponsored by corporations and individuals (Friedman, 2007). The effect of globalization has significantly influenced the culture and economy of many countries, particularly non-Western nations. As a result, many nations have been able to improve their economy, which in return has also improved their education system (Zakaria, 2011).

Recognizing the effect of globalization on education and the economy across the globe has caused nations to examine and compare their education systems to those of other developing nations. Such comparisons have had a positive outlook in the perceived value of education (Spring, 2008). Yet, the challenge to many nations is to know how to create and maintain a healthy education system to sustain their economy and prepare residents to acquire the skills necessary to compete in a 21st-century knowledge-based economy (KBE; Clifton, 2011). Such is the case with Costa Rica.

Costa Rica has blossomed under the influence of globalization. This nation has attracted hundreds of multinational corporations (MNCs) to invest in their workforce, which in return has helped to improve their economy and their education system (Costa Rica Investment Promotion Agency [CINDE], 2013). In order to prepare Costa Ricans to work and compete in a 21st-century KBE, the Ministry of Education (Ministerio de Educación Pública; MEP) established a nationwide decree that required all Costa Rican schools to participate in a National Program Science and Technology Fair (Programa Nacional de Ferias de Ciencia y Tecnología; PRONAFECYT; Valencia-Chacon, 2011). With the help of Intel (a major MNC) and MEP, Costa Rica has been prepared teachers for the PRONAFECYT initiative. However, not all schools have been able to participate in the PRONAFECYT initiative.
Hence, this study is designed to examine the role and leadership practices of school directors in Costa Rica in implementing the PRONAFECYT initiative.

1.1 Background of the Problem

Misra (2012) defined globalization as the integration of economies and societies through cross-country flows of information, ideas, technologies, goods, services, capital, finance, and people. These global changes have led to a highly competitive and rapidly changing environment for countries throughout the world. World societies are now more interconnected and interdependent than ever before (Armstrong, 2007; Friedman, 2007). For a nation to succeed in an increasingly interconnected global economy, changes to the local economy and education system must occur (Biesanz, Biesanz, & Biesanz, 1999; Friedman, 2007). Globalization has necessitated a change in the skills that students must develop to compete in an increasingly global workforce (Friedman, 2007; Spring, 2008). As a result, educational systems are no longer competing with other school systems in the same city, state, or even nation but rather are competing with schools around the world (Wagner, 2008).

Costa Rica has endured many changes since gaining independence in 1859 (Biesanz et al., 1999). Since its independence and the abolishment of its military, Costa Rica has placed its primary focus on education (Palmer & Molina, 2004). During the past 30 years, Costa Rica has adapted and reformed from a rural, agrarian society, to a high-technology hub of innovation in Latin America (Rodríguez-Clare, 2001). In addition, Costa Rica has initiated actions designed to attract foreign direct investment (FDI), including tax incentives and investments in infrastructure as well as changes to the educational system (Organisation for Economic Cooperation and Development [OECD], 2012). In order to continue to attract FDI, Costa Rica’s economic future is dependent on schools that produce knowledge and conceptual-based workers with skills in science, technology, engineering, and mathematics (STEM), in addition to essential 21st-century competencies (Rodríguez-Clare, 2001). However, according to Gereffi, Bamber, Frederick, and Fernandez-Stark (2013), 20% to 30% of students in Costa Rica do not finish secondary school. Moreover, in order to ensure a 100% literacy rate for all students, including those in rural and poor communities, by 2017, principal and teacher leadership must ensure that all students have equitable access to rigorous, project-based educational learning (PBL) in all schools (CINDE, 2013).

1.2 Purpose of the Study

The purpose of this study was to examine the role of educational leaders in preparing and implementing the PRONAFECYT in primary schools in Costa Rica. Furthermore, the study examined leadership practices, instructional strategies, and professional development (PD) practices at various school sites to identify key components of successful implementation of such initiative.

Four research questions guided the study:

1. What is the role of educational leaders in implementing the Costa Rican PRONAFECYT initiative?
2. How do teacher practices at successful schools differ from teacher practices at less successful schools, as measured by the level of participation in the Costa Rican PRONAFECYT?
3. How have site and system leaders prepared their schools to equip students with 21st-century skills necessary to participate in the Costa Rican PRONAFECYT?
4. How has participation in the Costa Rican PRONAFECYT affected instructional practice?

Bolman and Deal’s (2008) four frames of leadership and Kotter’s (1996) eight-step model for change were used to evaluate the role of educational leaders on the PRONAFECYT initiative. In addition, Capraro and Slough’s conceptual framework for PBL-STEM education and Wagner’s (2008) 21st-century survival skills were used to observe and evaluate teacher practices in Costa Rica.

1.3 Theoretical Frameworks

The following are conceptual frameworks were used in this study to observe and evaluate educational leaders and teachers in Costa Rica:

1.4 Kotter

The work by Kotter (1996) served as the framework for understanding how educational leaders create
and adapt to changes relating to the PRONAFECYT. The key points that Kotter (1996) emphasized were his eight-step change model of management: (a) establishing a sense of urgency, (b) creating the guiding coalition, (c) developing a vision and strategy, (d) communicating the change vision, (e) empowering employees for broad-based action, (f) generating short-term wins, (g) consolidating gains and producing more change, and (h) anchoring new approaches in the culture. The lenses of Kotter’s (1996) eight-step change model of management helped to define the themes of the findings for this study.

1.5 Capraro and Slough

The conceptual work by Capraro and Slough (2013) served as the framework to analyze PBL-STEM in the classroom, particularly as a means to prepare students in Costa Rica for the PRONAFECYT. PBL-STEM education is defined as instruction with an ill-defined task with a well-defined outcome that requires students to solve real-life problems while showing mastery in STEM in the process of solving the problem. PBL-STEM education has been shown to be an effective means to integrate 21st-century skills in curriculum and pedagogy (Capraro & Slough, 2013).

1.6 Wagner

With the new wave and demands of a KBE, Wagner (2008) outlined seven crucial skills to develop to survive and maintain efficacy in the 21st century. Wagner (2008) identified seven 21st-century survival skills: (a) critical thinking and problem solving, (b) collaboration across networks and leading by influence, (c) agility and adaptability, (d) effective oral and written communication, (e) accessing and analyzing information, and (f) curiosity and imagination. These skills were used as a theoretical framework to understand and analyze how these skills are implemented throughout the PRONAFECYT initiative from educational leaders and teachers in Costa Rica.

1.7 Bolman and Deal

Bolman and Deal’s (2008) four-frame methodology to leading organizations was used in this study as a theoretical background to examine Costa Rican leadership moving the country’s educational system toward a KBE. Furthermore, it was used to discover themes that identified leadership practices at both the site and systematic levels in implementing the PRONAFECYT. The four frames were (a) structural, (b) human resources, (c) political, and (d) symbolic.

1.8 Significance of the Study

Successful business firms have declared that all students must develop critical 21st-century skills and understand the dynamics of globalization compete effectively in a KBE (Wagner, 2008). Over the past decade, Costa Rica has made an effort to prepare its students with 21st-century skills by emphasizing STEM education and issuing a national decree that all schools will participate in the PRONAFECYT (Valencia-Chacon, 2011). This study was designed to examine the role of educational leaders in implementing the Costa Rican PRONAFECYT. In addition, the study was designed to identify teacher practices and preparation in Costa Rican schools that participate successfully in the PRONAFECYT initiative.

The intent of the study is to help the Costa Rican MEP to identify key attributes of schools that participate successfully in the PRONAFECYT initiative so they can help less successful schools to improve. This study is significant because it provides evidence of school leaders who have collaborated with teachers and the MEP to have their schools participate successfully in the PRONAFECYT initiative. This study can also be useful for school leaders to identify key attributes that were used to prepare and implement STEM practices in a school setting.

2 METHODOLOGY

A paper should contain the description of your study and should be structured in different sections such as: Abstract, Introduction, Methodology, Results, Conclusions, Acknowledgements (if applicable) and References. Please note that title and authors list should be coincident with the accepted abstract.

The methodology employed for this study was a qualitative approach. Merriam (2009) observed that qualitative research attempts not only to investigate what people are experiencing but also to interpret these experiences. There are many types of qualitative research that enhance the researcher’s ability
to interpret the study effectively. Creswell (2013) listed narrative, phenomenology, grounded theory, case study, and ethnography as means to complete qualitative studies. This study was an attempt to understand the role of school leaders in preparing and implementing the PRONAFECYT initiative within their school sites. This study also examined teacher practices and PD in relation to the PRONAFECYT initiative. Thus, Merriam (2009) defined this type of qualitative research as a case study.

One of the main goals of purposeful selection in a qualitative study is to deliberately select individuals who are critical for testing theories that correlate with a researcher's investigation. Deliberately selecting participants will provide information and data that are particularly relevant to the questions and goals of a qualitative study (Maxwell, 2012). However, for this particular study, the MEP and the MICITT of Costa Rica selected the participants.

Both the MEP and MICITT deemed that primary schools in Costa Rica were struggling the most to complete the PRONAFECYT initiative. An official recruitment letter was sent to MEP from our research team explaining the purpose of our research in Costa Rica. The MEP and MICITT identified and selected 18 schools within a 2-hour radius of the capital, San José, to participate in the study. Half of the 18 primary schools were considered to be less effective in terms of completing the PRONAFECYT initiative, while the other half were considered more effective. The MEP and MICITT sent to the research team a list of research sites for the study. Overall, the sample for this study consisted of 18 primary schools, 7 government officials, 18 primary school administrators, 4 business leaders, 1 Costa Rican PRONAFECYT director, and 3 university administrators. For this particular study, only one elementary school’s data, namely Santa Barbara Elementary School (pseudonym) was closely examined and analyzed. Also, for further analysis of data related to Research Question 2, another school, Colón Elementary School (pseudonym) was used to compare to Santa Barbara School. Through data analysis, Colón School was considered to have less successful participation in the PRONAFECYT than Santa Barbara School.

The overall purpose of this study was to examine the effects of educational leadership on participation in the PRONAFECYT initiative in primary schools in Costa Rica. This study also analyzed the effects of educational leadership in the development and implementation of the PRONAFECYT initiative. In addition, the study examined how 18 primary schools may have reformed their leadership, teacher training, and teaching practices to comply with the PRONAFECYT mandate.

A qualitative methodology was used. The MEP and MICITT of Costa Rica selected the sample population for this study: 18 primary schools within a 2-hour radius of San José, the capital city of Costa Rica. The following were selected as participants: 18 primary schools, 7 government officials, 18 primary school administrators, 4 business leaders, 1 National Costa Rican PRONAFECYT director, and 3 university administrators.

Instruments used for this study were surveys, interviews, and observations. Survey questions were designed to align with research questions and theoretical frameworks. All participants were asked to complete the respective survey. Interview questions are aligned with research questions and theoretical frameworks of this study. All interview responses were transcribed and evaluated using Patton’s (2002) qualitative analytical framework. Observations were conducted at all 18 primary school sites. Each observational tool is aligned with theoretical frameworks of Wagner’s (2008) 21st-century skills and Capraro and Slough’s (2013) PBL- STEM pedagogy.

Data collected via the surveys, interviews, and observations were transcribed to aid in triangulation to analyze the data from multiple sources (Merriam, 2009). Data collection and analysis were uploaded into system software, Dedoose. Creswell’s (2013) six-step approach for data analysis was then implemented.

3 RESULTS

3.1 Results for Research Question 1

According to Kotter (1996), organizational leaders must create a vision and a sense of urgency to implement change effectively. Once a sense of urgency is created, then leaders should genuinely seek a guiding coalition to create the change. In dealing with the change of organizations and the dynamics of leadership, Bolman and Deal’s (2008) four-frame model framework is an essential component in understanding the role of how educational leaders implement the PRONAFECYT initiative. The frameworks by Kotter (1996) and Bolman and Deal (2008) helped to identify the
influence of school directors in organizing, motivating, and implementing the PRONAFECYT at their respective school sites.

All organizations are complex, deceptive, and ambiguous, which makes it difficult for leaders to comprehend and manage. Such complexity demands that organizational leaders, in this case educational leaders, play a critical role to move a school from its former 20th-century ways of education to something that reflects the 21st century (Bolman & Deal, 2008). Such a dogma is also true for implementation of the PRONAFECYT at Santa Barbara School.

The data analysis for Research Question 1 revealed three common themes: (1) the school director’s critical role in organization and direction in implementing the PRONAFECYT, (2) the need for school directors to support and motivate teachers, (3) essential feedback from teachers for successful implementation of the PRONAFECYT. Theme 1 reflected on the important role of the school director in organizing and directing implementation of the PRONAFECYT. The role and overall involvement of the school director in the PRONAFECYT initiative provided committees and other teachers with the needed information and resources for this event. The second theme regarded the critical role of motivation by the director to the staff in implementing the PRONAFECYT at Santa Barbara School. The third theme identified how feedback from and to the director of the school positively influenced successful participation in the PRONAFECYT at the school.

3.2 Results for Research Question 2

Research Question 2 asked, “How do teacher practices at successful schools differ from teacher practices at less successful schools as measured by the level of participation in the PRONAFECYT?”

One of the biggest challenges that all nations face, in particular Costa Rica, is the need to change pedagogical practices and curricula to reflect the needs of the 21st century. How and what students are learning today are drastically different from 10 years ago (Wagner, 2008). Indeed, there is an educational culture of two centuries that seems to be pulling against each other rather than letting go. Such conflict has caused many education systems to redefine essential skills and information that should be implemented in school practices to be on par with 21st-century needs (Spring, 2009; Wagner, 2008). Hence, the PRONAFECYT is one example.

The emergent themes for Research Question 2 indicated that Santa Barbara School teachers gave purpose behind the need to participate in the PRONAFECYT more than Colón School teachers, which resulted in more participation. In addition, Santa Barbara School teachers involved students more in STEM PBL instruction and reached out to parents more than Colón School teachers, which resulted in Santa Barbara School having a more successful participation of students and the community in the PRONAFECYT.

3.3 Results for Research Question 3

Research Question 3 asked, “How have site and system leaders prepared their schools to equip students with 21st-century skills necessary to participate in the Costa Rican PRONAFECYT?” The overall objective of Research Question 3 was to identify how school site and system leaders prepare and equip students with the necessary skills to participate successfully in the PRONAFECYT. This question was also intended to give an analysis of local school site and national practices. Two frameworks were used to guide data analysis of data for Research Question 3: Bolman and Deal (2008) reframing organizations frameworks and Kotter’s (1996) eight-step change process.

The emergent themes of Research Question 3 demonstrate that site leaders lacked financial and infrastructure resources from system leaders. Indeed, many system leaders recognized that the amount and distribution of funds were neither sufficient nor equitable. In addition, many teachers and site leaders recognized a lack of cohesive teacher training to prepare and implement the PRONAFECYT initiative.

3.4 Results for Research Question 4

Research Question 4 asked, “How has participation in the Costa Rican PRONAFECYT affected instructional practice?” The purpose of this question was to investigate how participation in the PRONAFECYT has changed, if applicable, the instructional practices of the teachers. It was also intended to determine whether Wagner’s (2008) 21st-century survival skills were implemented in one way or another in the instructional practices of the teachers because of the PRONAFECYT initiative.
Hence, Wagner’s (2008) 21st-century survival skills were used as the theoretical framework to analyze the data for Research Question 4.

The themes for Research Question 4 were that PRONAFECYT projects and experimentations were done at the classroom level. Having access to do them at the classroom level positively affected instruction and curriculum, especially in science. Students were able to be participants in learning rather than receivers. Furthermore, the PRONAFECYT promoted more abundantly Wagner’s (2008) 21st-century survival skills, particularly critical thinking, effective oral, and written communication. Teachers are now able to help students to develop skills to present their ideas and PRONAFECYT projects across diverse groups of pupils.

3.5 Summary of Results

The impact of 21st-century globalization has helped Costa Rica to improve its economy and education system. The influx of MNCs into the country has not only boosted Costa Rica’s workforce but has also reshaped the focus of education in the country (Paus & Gallagher, 2008). One of Costa Rica’s main challenges now is to educate its citizens to compete in a KBE (Rodriguez-Clare, 2012). Implementing the PRONAFECYT initiative throughout the entire country’s education system is one way Costa Rica is preparing its citizens.

The director at Santa Barbara School played a vital role in implementing the PRONAFECYT at the site level. The data indicated that the more involved the school director was in implementing the PRONAFECYT, the more likely it would be executed successfully. Feedback from both the teachers and the director was an essential component of implementing the PRONAFECYT.

Another component that made Santa Barbara School have more successful participation in the PRONAFECYT initiative than Colón School was the fact that teachers gave purpose as to why they were having students participate in such an event. Teachers at Santa Barbara School teach students more STEM PBL lessons than teachers at Colón School, which helps to motivate students to want to participate. Furthermore, teachers at Santa Barbara School reach out to parents for support more than teachers at Colón School, which also influenced successful participation in the PRONAFECYT at the site level.

Despite the tactics used by Santa Barbara School staff to have successful participation in the PRONAFECYT, they recognized that they lacked support from system leaders. One of the main concerns for Santa Barbara School was the notion that Costa Rica’s education system lacked the financial resources and infrastructure to support the school’s initiative to implement the PRONAFECYT. Even some of the system leaders admitted to not garnering enough focus and funds to support and promote the PRONAFECYT throughout the country. Not only is there a lack of financial and infrastructural support; there is a notion from the teachers that training on how to implement the PRONAFECYT is minimal.

Notwithstanding, the current implementation of the PRONAFECYT allows students and teachers to demonstrate projects and experiments in the classroom at all grade levels, which apparently was not the norm in past years. With this new norm, teachers have augmented science and technology learning. In addition, teachers have implemented instructional strategies that have promoted Wagner’s (2008) 21st-century survival skills, particularly critical thinking, analyzing information, and developing effective oral and written skills.

3.6 Subsection

3.6.1 Sub-subsection: Guidelines for Abbreviations and Acronyms

CINDE - Costa Rica Investment Promotion Agency
KBE - Knowledge Based Economy
FDI - Foreign Direct Investment
PRONAFECYT - Programa Nacional de Ferias de Ciencia y Tecnología (Spanish). The National Program of Science and Technology Fairs (English Translation).
MICITT - Ministro de Ciencia y Tecnología (Spanish). Ministry of Science and Technology (English Translation)
OECD - Organization for Economic Cooperation and Development
PBL - Project Based Learning
STEM - Science, Technology, Engineering and Math

4 CONCLUSIONS

The socioeconomic and education system of Costa Rica has improved significantly since the country began to attract FDI (CINDE, 2013). Moving away from an agrarian society to a technological nation has brought about many positive changes, as well as many challenges (CINDE, 2013). The challenge of preparing and producing skilled knowledge-based workers will take more than just a collaborative effort from all stakeholders, including government agencies, the private sector, and the university system, to address this problem. Although the country is making a concerted effort to help K–12 students to prepare for 21st-century skills through the PRONAFECYT initiative, there are still major gaps as to the direction and support of such initiative. In order to fill the gaps, two recommendations are presented: (a) Create a budget only for the PRONAFECYT initiative, and (b) invest in more frequent teacher training focused on the PRONAFECYT initiative.

The findings in this study revealed that there were neither financial nor infrastructure resources to sustain the PRONAFECYT initiative effectively. Many of the teachers and school leaders recognized a need for more financial support to execute the PRONAFECYT initiative. The study revealed that the MEP has a categorical budget for all school fairs, which includes the PRONAFECYT. The MEP does not have funding dedicated solely for the PRONAFECYT and neither does the MICITT. Since there is no budget for the PRONAFECYT initiative, there is also no one specifically in charge to give direction as to how the funding should be distributed and for what purposes. It would be beneficial to have a budget only for the PRONAFECYT initiative. It would also be beneficial for the MEP to create a department focused only on the PRONAFECYT initiative, headed by a director of such initiative. Thus, it is recommended that the MEP create a department and director of the PRONAFECYT initiative that can oversee the budget and the needs of all schools. It is also recommended that, if possible, Santa Barbara School create a reserve in the budget to be used solely for the PRONAFECYT initiative.

One of the major needs identified in the findings was the need for frequent teacher training focused on the PRONAFECYT initiative. The findings revealed that there was not only infrequent teacher training, but also there was no alignment as to who was given the training. Personnel from the UCR proclaimed that they gave PRONAFECYT training to teachers; however, none of the teachers at Santa Barbara School indicated in their interviews that they had received training from UCR. The findings showed that only the school PRONAFECYT coordinator received training from the MEP once a year. The coordinator was then expected to explain to the rest of the school the content of that training. It is recommended that the MEP create a systematic process in which teacher training is given frequently throughout the year to all teachers. Since the burden of implementing the PRONAFECYT falls on the director of the school, it would be highly beneficial to train all school directors on how to implement the PRONAFECYT initiative. Training for both teachers and directors should be frequent, with benchmarks to achieve throughout the year. Training should include effective STEM PBL instructional practices, promotion of 21st-century skills, and preparing and executing the PRONAFECYT at the school site. Having a reciprocal accountability system in which the MEP guides schools through the process while the schools expect the training and direction on what to do would be effective. Furthermore, it would be beneficial for the MEP align their training with that from the MICITT and UCR. In the meantime, if Santa Barbara School cannot receive frequent and adequate training from regional and government officials, it is recommended that school officials contract a consultant to facilitate PRONAFECYT teacher training throughout the school.

4.1 Future Research

This case study focused on the role of educational leaders in the PRONAFECYT initiative. It would be interesting to conduct a longitudinal study of Santa Barbara School and all other schools investigated in this study regarding implementation and practices of the PRONAFECYT initiative. A longitudinal study would give an in-depth look at how the schools attempt to participate in the PRONAFECYT initiative. It would also give a close look at the leadership practices of the directors of each school site.

Another research focus would be a study on the political climate regarding the PRONAFECYT. Since presidential parties in power are allotted only 4 years of service, it would be interesting to study the political implications of the PRONAFECYT initiative. The study could include policies that correlate
with the purposes of the PRONAFECYT initiative, such as allocation of funds, tax exemptions and business loans for native entrepreneurs, and Tico innovation productivity. These findings would inform the public and especially educators regarding political prioritization of the PRONAFECYT and political impediments that could hinder progress of the initiative.

The third area for future research would be to investigate the type of PRONAFECYT projects that are created by the students at both Santa Barbara School and Colón School. It would be interesting to learn how projects are initiated, guided, and executed. The responses in the interviews revealed that some of the projects for the PRONAFECYT were plagiarized from the Internet. It would be interesting to learn whether there are any common themes or projects that students identified across the country. By knowing the type of projects that are created for the PRONAFECYT, school officials could redirect and guide STEM PBL instruction and PRONAFECYT policies.

4.2 Conclusion

Costa Rica is a small nation that has taken advantage of 21st-century globalization. The Tico nation has prioritized its education and attracted MNCs to establish business and industry there. The initiative to prepare citizens for a KBE through the PRONAFECYT is praiseworthy. Despite positive intentions, there are still misalignments in the political system that lead to financial restrictions that inhibit schools, particularly school directors, from successful implementation of the PRONAFECYT initiative.

Costa Rican politics will enable the country to become innovative and create a spirit of entrepreneurship. The fact that many students copy projects for the PRONAFECYT from the Internet without designing original projects is analogous to Costa Rica's entrepreneur dilemma. Costa Rica manufactures technological and engineering goods but does not necessarily create innovation. Costa Rican politics should align the focus to open doors equally for Ticos, as they do for FDI, to enable innovation in the 21st century. Giving Ticos the same exemptions as FDI and MNCs would give them an equal start to reconstruct a Costa Rican culture of STEM workers, entrepreneurs, and innovation. If they can politically align their focus, citizens of this beautiful country will transform Latin American economics and set a precedent across the globe.

Costa Rican politics will enable the country to become more innovative and create a spirit of entrepreneurship. The fact that many students copy projects for the PRONAFECYT from the Internet without designing original projects is analogous to Costa Rica's entrepreneur dilemma. Costa Rica manufactures technological and engineering goods but does not necessarily create innovation. However, if Costa Rican politics can align with all stakeholders in supporting and promoting the PRONAFECYT, then perhaps the Tico nation can begin to develop a culture of STEM workers, entrepreneurs, and innovation. Aligning their focus will also help citizens of this beautiful country to transform Latin American economics and set a precedent across the globe.

REFERENCES


