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Pan Africa Business Simulation Game

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Abstract - Economists have demonstrated the existence of a positive correlation between management quality and the country's economic performance. In turn, business simulation games have shown their educational effectiveness in developing management skills crucial for African countries. However, its use is still incipient. Although they present different characteristics favourable to its implementation, for example: The African Continental Free Trade Area, the Digital Transformation Strategy Project for Africa (2020-2030) and The Pan-Africa Games Group, they also present singular characteristics such as the predominance of the informal sector, political instability and high corruption rates. These factors influence the design and adoption of a Pan-African Business Simulation Games Framework suitable for this specific context. This proposal aims to contribute a gaming framework to support collaborative development and appropriation by the end-users and Multi-User with content representative of their contextual diversity. The successful EVER project and Bootcamp created by the Mozambican firm ITIS, which adopted a lean startup methodology to add local content in Business Games, can serve as inspiration for the Pan African Business Simulations Games - PABSG.

Keywords - Game-Based Learning, Business Simulation Game, Pan Africa, Game Design

I. INTRODUCTION

The use of Business Games or Business Simulation programs is consensual in the literature that it started 3 thousand years before the common era and became massive around the 50s with the development of computing. The process since that decade has been accompanied by the emergence of international associations such as ABSEL, ISAGA, and others dedicated to research publication and programme proposals.

The African continent, despite the lack of companies and organisations to provide internships and other practical activities to young people, who make up the majority of the population (generation Z) [1]–[3], does not record the use of business games, which have proven their effectiveness at the didactic level. The specialised organisation Pan Africa Group Games was only formed in 2021. Projects based on simulations and virtual reality have been used not only because of their proven effectiveness, but also because they reduce risks, costs and time, if the activities had to be carried out in a real context [4]. It is in this perspective that the present article aims to propose the Framework design of Pan

- African business games, and for this it was developed research based on literature review, qualitative and exploratory case study because the main question is “*what can be learned from study of startup business*” [5], resulting from the experience of the author who was the tutor/teacher/co-founder of the project SPEE, EVER and Bootcamp promoted by the company ITIS in Mozambique. ITIS identified a problem that could be analysed on the basis of lack opportunities for Z Generation internships or lack of organizations involved in practical learning based on management at international standards, as shown in Figure 1 - Tree Problems.

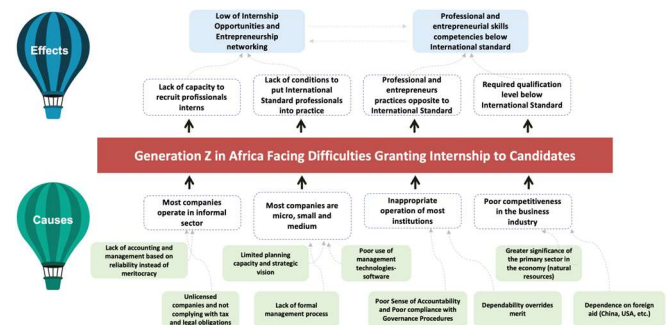


Figure 1 – Tree Problem

II. LITERATURE REVIEW

On one hand, economists and social science researchers have demonstrated the existence of a positive correlation between management quality and the performance of people and companies therefore the country's economy [6], [7]. On the other hand, business simulation games, since the 1950s, have demonstrated their pedagogical effectiveness in the development of management skills such as communication, teamwork, strategy definition, among others [8]–[10] that are crucial for developing countries [4]. Approaches on the effectiveness of entrepreneur simulation games have been made in the context of game-based learning, serious games [11], gamification [12], [13], the latter's effectiveness is questionable [14], [15]. There are several empirical studies supporting the effectiveness of business simulation games, in their different types (conceptual, top, functional) [16] and interventions at publication level made by organisations specialised in learning games, most of them created more than 60 years ago [17].

However, despite the African continent having a higher predominance of developing countries, the use of games is very nascent. Nevertheless, awareness and opportunities for games adoption increase with a majority of young population (15 years old) with access to technology [18], the significant

improvements in the business environment index [19], The African Continental Free Trade Area (AfCFTA [20], the Digital Transformation Strategy Project for Africa (2020-2030). The Pan-Africa Games Group (PAGG) is the first games organisation representing more than 10 African countries, with over 200 professionals and 8 different languages. PAGG aims to harness the power of gamification to create fun ways to solve some of Africa's challenges, including health, education, women empowerment and climate change. Despite these advances, other characteristics common to most countries still persist, namely, predominance of the informal economy [3], [21], problems in statistics, such as overstated GDPs[1], corruption (Neo-Patrimonialism) [22]–[25] and political instability [22]–[24], [26], [27]. According to Lopes, the challenges in Africa is poor planning, design, and execution skills are characterized by macroeconomic volatility, weak institutional and human capabilities, limited investments in social and economic infrastructure, limited investments in technology and R&D, and political instability[1].

Table 1 - Klabbers Simulation Game Analysis Framework [17]

Games Architecture			
Design Specifications	1. Client 2. Purpose 3. Subject 4. Target Group (Intended Audience) 5. Context of Use		
Social System	Syntactic (Form)	Semantics (Content)	Pragmatics (Use)
Players	Number of players. Number of positions of the participants in the game	Roles Composition of roles in the social organisation.	Context of learning: types of targeting; purpose of learning, Types of knowledge;
Rules	Rules of interaction with the game; Rules of preparation; Rules for starting and stopping; Rigid rules; Rules governed by the principles of the game; Free form; Starting positions; Permitted moves; End positions in the game;	Relationships between roles, communication, rules, procedures Evaluation of destinations/places for resource allocation and relative position between players	Teams of facilitators Format and instructions for strict rules versus free form. Evaluation functions
Resources	Space of the game; Set of positions in the game; Set of pieces;	Positioning of the pieces; significance of the cultural and socio-economic situation Set of occupied and available positions	Materials; Equipment; Accessory or paraphernalia Installations

According to various research on business simulation games, they can be defined as simulators that combine organizational context models with mathematical models to simulate administrative processes in an economic context that should be realistic [28]–[30]. Due to the increase in computing power and ease of use, students may be asked to create their own "better" versions of the business games in addition to making decisions in the traditional ones [31] i.e.

it is possible to include functionalities that allow its appropriation and creation by end users, for instance wiki [32] or cocreation [33].

The Business Games can present some similarities; however, they can be different according to several elements such as, purpose, target group, rules, among others as shown in Table 1.

The proposed design process should observe similar phases to scientific research, starting with a clear definition of the goal that is intended to achieve with the game, then the study of existing solutions on the market, characteristics and survey of existing research on the subject, as shown in Table 2. The conception of the game proposal must go through successive validation tests. After the validation tests it is possible to train the participants who will be responsible for using the system to training others.

Table 2 - Steps To Produce Business Simulation Games [34]

Step	Summary Description
Definition of specific objective	Define a set of specific objectives that must be achieved.
Review of previous work	Review previous research to detect and correct deficiencies
Elaboration	Develop the product that achieves the intended objectives
Tests and evaluations	Test on a group that can be used and eventually assess its suitability for the objectives.
Revision	Revise the product
Re-testing	Repeat the testing and review to optimise the product.
Training	Produce a teacher training programme.

III. ITIS CASE

Instituto de Tecnologia, Inovação e Serviços (ITIS)¹ was created in 2010 in Mozambique, with the Slogan "*Innovation as Continuous Requirement*" initially having Business Simulation Games - SPEE (*Sistema de Práticas Empresariais e Empreendedorismo*) as their main product. The Business Simulation Games started in Mozambique in 2005 with Instituto Superior de Ciências e Tecnologias de Mozambique (ISCTEM) with platform acquired from Expandindustria² company based in Portugal, followed by UEM being acquired by Aveiro University³, Portugal in 2009. In 2010, ITIS launches the first Business Simulation Game called *System of Business Practices and Entrepreneurship* - SPEE, becoming the first and only startup in Mozambique in the serious games sector. "*A startup is a temporary organization in search of a scalable, repeatable, profitable business model*" [35]. The ITIS achieved scalable with new business model. First of all, the based-on subscriptions that could be acquired semi-annually, annually or by getting an unlimited license. Second SPEE designed base on local reality and feedback ("*appropriate, guiding and significant*" [30]) from a potential customers (players), business stakeholders environment such as Stock exchange, banks, authorities revenue, universities, business associations, etc iteration perspective, i.e. a *lean startup* approach [36] and "*because great ideas come from networks, not individuals*" [37]. According to [1] local realities:

Any approach aimed at understanding Africa's development and related challenges that ignores the roles of local actors but privileges large actors such as the world bank misses the reality

¹ <https://itis.ac.mz/en/home/>

² <http://www.expandindustria.pt/>

³ <https://www.ua.pt/pt/uc/10115>

of development as a homogeneous activity. To block out any sterile theoretical excess, we must take into consideration the roles of different actors in society and consider how each defines its own reality of development.

The majority of business games in Africa (Mozambique Case) is similar to World Bank and International Monetary Fund program in Africa (Structural Adjustment Programs - SAPs) i.e., policy prescriptions that applied without proper context.

“Too often, these conventional policy recommendations focus on one-size-all and business-as-usual models that do not accommodate Africa’s diverse and fast changing realities nor do they allow for local agency” [1].

In additional, the player (student) won't be able to develop a mental model that is congruent with the real phenomenon if the game model does not accurately represent the genuine reality [30].

Third SPEE adopted a model similar to the one developed by Henry Mintzberg (experiencing management by action) [38], in which students are not forced to simulate in one sector or company, but to create a company according to their dreams, expectations or previous professional experience.

The scalable recurring model can be noted by the growth as shown in Figure 2, where between 2010 to 2017, 10 higher education institutions started using SPEE. By 2019 bootcamp Business Simulation⁴ were tested for adolescents between 11 and 17 years of age and in 2020 began an internationalization process with EVER project (virtual internships)⁵ involving Portuguese-speaking countries, namely: Brazil, Angola, Mozambique, Cape Verde, São Tomé and Príncipe. Over the 12 years of SPEE, trainees have created successful companies, such as Edilson Alberto (18 years), Prince Chone (17 years) and others⁶. It can be said that the product fits the concept "Job To be Done - (JTBD)" [39] by promoting the spirit of entrepreneurial attitude and good management practices for which it was designed.

The EVER experience involved students from five Portuguese speaking countries, where 4 virtual companies were created in Mozambique. The participants showed enthusiasm in the e-learning project, and despite not knowing the Mozambican legislation and having the first contact with SPEE in EVER, it was possible to see that young Africans are "native speakers" in digital tools [11]. Participants noted that business games are key to developing skills such as professionalism, leadership, teamwork, critical thinking, assertiveness, time management, diversity and responsibility [31]. In the experiment it was possible to see that African countries with few resources to acquire laboratories, can benefit from gaming technologies to simulate various scenarios [4]. The purpose of SPEE is to develop management and entrepreneurial skills, and at the moment it is not known whether the participants of the EVER project created companies in their respective countries, as happened in the Bootcamp and in the Universities in Mozambique, despite the fact that in the researches done the business simulation players were successful in their professional careers [40].

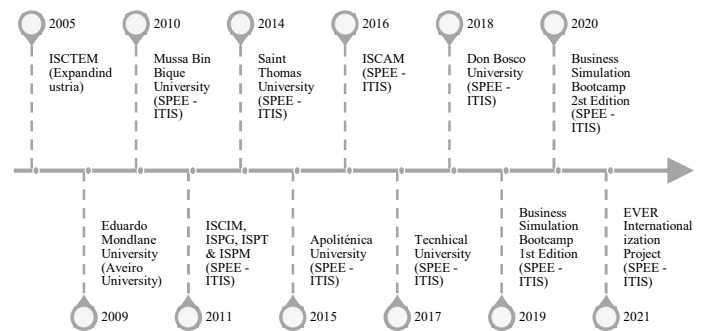


Figure 2 - Chronology of the Implementation of Business Simulation Games in Mozambique

IV. CONCLUSIONS

The design of the Pan Africa Business Simulation Game Framework can be inspired by the various theoretical approaches and the ITIS experience with EVER and Bootcamp. The success of EVER and Bootcamp was because the target group was young, familiar with information technologies and above all to the design that took into consideration the local content (Glocal) contained, based on “the lean startup” development, “experiencing management by action” by Mintzberg.

Given the predominant characteristics of the African context (informality, corruption - neopatrimonialism/patronage and political instability) to ensure inclusive (lean) development, it is possible to include functionalities that allow its appropriation and creation of content by end users and Multi-User providing the players virtual interaction and work together to accomplish shared objectives without travel expenses. This is a global trend in participatory cultures that translates into the design of interactive technologies that support appropriation and reconfiguration by end-users and multi-users. Artificial intelligence can also be used to capture the local experiences of the diverse contexts of African countries.

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⁴ <https://www.instagram.com/smaqsc/> and <https://itis.ac.mz/business-simulation-boot-camp/>

⁵ <https://www.youtube.com/@canalitis4096>

⁶ https://www.instagram.com/blessking_photography/
https://xonguila.co.mz/rubrics/Oe3L_0B4iHZYOUZCa3gag%3D%3D%2BOutros/cBgjUntB7rej3DUvxhn0Q%3D%3D%2BTechsolutions

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