ENHANCING ENTREPRENEURIAL SKILLS WITH THE DEVELOPMENT AND EVALUATION OF AN E-LEARNING SYSTEM

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Abstract—This research paper outlines the training interventions needed for developing Small-to-Medium entrepreneurial (SME) skills in emerging economies. Using Design Science approach through the implementation of an E-learning system, content pertaining business skills development is delivered through a content management system. Three entrepreneurial skill sets are identified and presented as content through the system. These are entrepreneurship skills; management skills, and technical skills. The content management system also supports collaborative learning through peer-to-peer learning. Moodle 2.9 which is an open source learning environment is used as the content management system to deliver the content. A survey is used to evaluate the system.

Index Terms—E-Learning system, Entrepreneurial skills development, Collaborative learning.

I. INTRODUCTION

This research paper studies the development of entrepreneurial skills in developing countries and emerging economies particularly South Africa. Entrepreneurship development is key in the development of any countries economy. Entrepreneurial education is basically defined as “the process of providing individuals with the ability to identify commercial opportunities and the insight, self esteem, knowledge and skills to act on them” [14]. The research looks at to develop an E-Learning platform to provide a framework that provides tools, practices and business models for self-perpetuating development of start-up business skills. Three entrepreneurial skills are identified and present as content through the system, these skills are such as entrepreneurship skills, management skills, and technical skills. For the purpose of this study, the focus group of entrepreneurs is those entrepreneurs whom have been trading for less than two years and have an annual turnover of less than 2 million.

This research aims to contribute in closing the gap in entrepreneurial skills shortage and knowledge transfer between experienced entrepreneurs and start-ups.

Training is imperative for business development, especially for those entrepreneurs in the starting phase of operating a business. 9 out of 10 start-ups fail within the first two years of operations due to several of reasons such as business model failure, poor management, cash flow, and sales not meeting projections, lack of production capacity.

Lack of knowledge and skills transfer programmers are non-existed in some rural communities. With the South African unemployment rate high the role of skills development within entrepreneurship is key in developing a suitable economy. Stats have indicated that E-Learning is mostly used in big corporations, showing that not much E-learning is applied in the SME’s (Small-Medium Enterprises) sector and most of the few activities are of poor quality [7]. The short-fall of accurate entrepreneurial skills has lowered search effectiveness of potential young entrepreneurs and the rate of start-ups [2]. Slow economic growth coupled with high unemployment rates is a major challenge in merging economics, reflecting limited entrepreneurship activity and private sector job creation. But despite economics literature identifies other factors such as: social capital; family backgrounds and networks;
demographic changes; individual human capital; skills and geographical mismatch; characterizes of specific economics [2]. Improving entrepreneurial skill sets can be a key channel to advance productivity and incomes in the informal economy as well as SME sector. Nonetheless multiple of challenges are faced with training interventions such as: access to training, time constraints, cost of training and quality of training.

Following the problems stated above, this research aims to address these problems by developing an E-learning system for entrepreneurial skills development. The primary research question is: How can we enhance entrepreneurial skill sets in emerging economies using E-learning as a learning tool? The sub-questions to support the primary research question are: How to use content management systems to enhance learning? How to effectively share content among entrepreneurs? How to effectively measure individuals’ entrepreneurial skill sets and understanding of business operations and management?

The shortage of entrepreneurial skills has lowered the effectiveness of productive in the SME (Small-to-Medium Enterprise) sector. This study will contribute in closing the gap within entrepreneurial skills shortage amongst start-ups. As well, the outcome of this research will boost economic activities in the SME (Small-to-Medium Enterprise) sector and job creation.

The limitation factor of this study is that only three entrepreneurial skills are identified and presented as content through the system. Such entrepreneurial skills are management skills and technical skills.

II. LITERATURE REVIEW

A. Introduction

Greater entrepreneurial activity in the SME sector has become a prominent goal for numerous state governments [6]. The significance of entrepreneurship for economic development has been highlighted by many researchers, and that training and skills development plays an important role in cultivating future entrepreneurs and developing existing entrepreneurs [6]. The goal of entrepreneurship skills development is to develop entrepreneurial capacity and mindset by fostering innovation, creativity and self employment [2]. Growth in the SME sector could bring competitive advantages in the marketplace and provides benefits in terms of social and economic growth [6]. Research has indicated that the measure of entrepreneurial growth is measured through growth in revenue, increased market share, return on investment [5].

The growth barriers for entrepreneurs, showing the external barriers influencing the business from growth are availability of skilled labor; strong competition in the market; government policies; non supportive legislation. The primary issues involved in internal growth barriers are psychological motivation; lack of resources; poor product or service; lack of management capability [5].

B. Entrepreneurial Skills Sets

The educational methodology used in today’s society is one which helps to develop ones mindset, behavior, capabilities and skills, which could be applied to create value [9]. Many researchers have indicated that the entrepreneurial skills sets can be broken down into three groups: Management skills, Entrepreneurship skills and Technical skills [2].

Figure 1 indicates the entrepreneurial skill sets for entrepreneurial development, and they are as following: Technical skills are the skills necessary to produce the product or service. Management skills are the skill sets

Fig. 1: Entrepreneurial skill sets [2]
entrepreneurship development which include: the ability to identify business opportunities and exploit them, a willingness to undertake risks, human creative efforts of building a business, competence to organize the necessary resources.

C. Content Management Systems

Content management systems are defined as systems or applications that deal with the creation, storage, modification, retrieval and display of content [12]. Content management systems provide the infrastructure necessary for multiple individuals to effectively contribute content and collaborate. CMS (content management systems) typically offer access rights for security, easy content creation and editing for non-technical individuals, structured workflow processes, templates for consistent output [10]. The new generations of content management system called WCMS (web content management system) are created to meet the needs of organizations with an ever growing online presence. Web content management systems have the capability of social broadcasting, support for mobile sites, intuitive methods for content sharing, analytics and reporting, compatibility with 3rd party applications [3]. The benefit of CMS systems is that they allow for multiple of formats to be used such as HTML, PDF, audio, and content is checked for compliance to ensure that it meets certain conditions. The cost associated with CMS usage is lower because the technical processes are less complicated and content creation is less costly. The version control is also automated allowing for backup of content as modifications are made, and audit trials that track changes made.

D. Collaborative Learning

Collaborative is important to support entrepreneurship development because it allows the transversal of knowledge from experienced entrepreneurs to non-experienced and beginner entrepreneurs. Collaborative learning is stated as the interaction of students with each other online [13]. Social constructivist learning assisted through E-learning can be applied to entrepreneurship education and skills development [13]). Research indicates that mentoring focuses on four psychological functions: motivation, reflector, confidant, reassurance and four entrepreneurial career related functions: information support, integration, confrontation and guide [11]. Monitoring as a learning intervention may have relevance for entrepreneurial development particularly to entrepreneurs both experience and reactions to critical incidents are important to their learning processes [14]. E-monitoring has been defined as the merging of monitoring with the use of electronic communications using tools like virtual monitoring, cyber monitoring telemonitoring [13]. In regards to collaborative learning VLE (virtual learning environments) provide easy usage, increased user interactions, permanent record of participation [13].

E. Electronic Learning

The digital revolution has had a significant impact on innovation, new business models and the learning industry [3]. E-learning (electronic learning) is defined as creation and distribution of knowledge through online delivery of information, communication and training. Such learning takes place anytime an individual makes use of electronic means for gathering information, acquired without a second party present. Entrepreneurs can participate in online learning environments, which can enhance learning by allowing them the ability to apply knowledge and skills otherwise they would have not been able in an offline environment because of costs and time constraints [4].

III. RESEARCH METHODOLOGY

This research paper aims to develop and design an E-learning platform that provides training interventions needed for developing entrepreneurial skills in emerging economies and support collaborative learning. The research questions and objectives are mapped into suitable methodologies in the table below:

Table 1: Research questions and objectives are mapped into suitable methodologies

<table>
<thead>
<tr>
<th>Research question</th>
<th>Technical objective</th>
<th>Methodologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to use content management systems to</td>
<td>To use content management systems to</td>
<td>Review of Literature, Prototyping</td>
</tr>
</tbody>
</table>
We would use a design science approach to develop and design the prototype based on technology research methodology.

The research project follows a positivist research design model but will involve some elements of interpretive participatory research [2]. The positivist research design employed involves methodologies like prototyping used in the development phase. This considered as very reliable [4]. Positivism research will be used for the purpose of research design because it involves methods like prototyping that uses development phases and experiments for evaluation phases.

The research will also involve some elements of descriptive interpretive studies. According to Aggarwal [1], interpretive research is a method of research that assumes that individuals create and associate their own subjective and inter subjective meanings as they interact with the world around them.

The research strategy approach that will be used is design science research methodology. According to Vaishnavi and Kuechler [16], Design Science is a suitable methodology for research involving software development. An approach that focuses on the development and design of artifacts based on technology research methodology [16]. The methodology consists of the following process steps [16]:

**Awareness of problem:** Identifying the problem area by doing research on previous works done in the area of interest. Furthermore, understanding the problem can occur by engaging with the study area of the subject matter.

**Suggestion:** Suggesting resolutions and solutions to the identified problem, in which new functionality is envisioned. This could be in the form of a prototype build on the bases of solving the identified problem.

**Development:** The development or implementation of an artifact, this involves using various techniques including algorithms, knowledge management tools, and expert systems.

**Evaluation:** Once development is completed, the artifact should be evaluated. The technique for evaluation could be a qualitative or quantitative approach, or using developmental evaluation (DE) approach/ adaptive evaluation which are best suitable for evaluating prototypes.

**Conclusion:** The evaluation would provide feedback so we could reach a conclusion on the research. This is the final stage, evaluating the results of the artifact developed to ensure that it meets the desired results, and if there is any minor divergences and these deviations could be recommended as areas for future studies [16].
Proceedings of 2nd International Conference on E-Learning Engineering and Computer Softwares
Held on 13th – 14th July 2016, in Bangkok, ISBN: 9788193137352

A. Prototyping
A prototype is a sample system built to test and learn about the processes that it can perform. It is mostly designed to test a newly designed product to increase the quality of usability, and it acts as a specification of a running system instead of a theoretical one. Prototyping’s main idea is to build and understand the requirements before a design or coding can proceed. By doing that, one gets the actual feel of the system before it is developed based on the requirements of the desired system.

In terms of an information system, prototypes are employed to help system designers build an information system that is easy to manipulate for end users. It is an iterative process that is part of the analysis phase of the systems development life cycle (SDLC). Prototyping refers to building web application prototypes which display the functionality of the product under development but may not actually hold the exact logic of the original application.

A trial web-based communication is built for the Department so that users or employees can interact with it to experience the feel of the future platform. Prototyping helps users to have a version of a complete and working product or application instead of a brief description of how the system will look like in the future.

System development life cycle provides a system used to build and monitor application software. SDLC is a complete process for developing information systems and oversees all the steps and activities involved in the development of a new system. Employee involvement and the right implementation methodology when developing software are critical to the success of the organization.

(iii) Design Phase: The design phase determines how the system will operate or work (in terms of software, hardware, and network infrastructure), the user interface, and the specific programs, databases, and files that will be required.

Usage Scenario of the Student
- The student registers by providing valid information.
- The student gets a page with access links to subjects added.
- From each subject there are lists of topics that are related to the particular subject selected.
- The student selects a topic of interest, after which the content of the topic shall unfold.
- At the end of each topic, a student would have to answer a couple of questions in relation to the topic content that just unfolded.
- There shall be availability of shared contents in relation to a particular topic content which can be freely accessed by the student at any time.
- There shall also be discussion forums in relation to particular topic content.
- The student shall also have the ability to communicate with each other outside the discussion forums.

![Fig. 2. Students’ use-case diagram showing how the student/learner interacts with the system)](image)

B. Interpretive Case Study for the Evaluation
The population that is used to evaluate the prototype consists of entrepreneurs around Soshanuwe and Pretoria. In this phase this study applies the snowball sampling method. Snowball sampling is a non-
probability sampling technique that is suitable to use in research when participates are difficult to locate [16]. In this sampling technique a researcher collects data on a few participates, then requests those participates to provide information to locate other participates.

A Self-Administered Survey data collection tool is used in this study, the survey is presented as a web-based form, developed.

IV. SYSTEM DEVELOPMENT RESULTS
The results of the system built to provide training interventions needed for developing entrepreneurial skills in emerging economies and support collaborative learning.

The moodle framework provides a strong environment for local and centralized development and management. The moodle learning management system provides a structured environment where everything can be monitored and controlled centrally, it also provides for rapid development methods. The moodle framework is a well structured learning management system and allows for self-paced training.

The web application will also have other pages such as:

- Photo gallery page where employees share pictures of events
- About page provides background about the functions of the unit
- Marketing mix page allow employees to share strategic documents
- Resource centre page enables colleagues to share information about registered events and project reports
- Events calendar list all current and upcoming events
- Contact us page provides contact details of marketing team.

Fig. 3. Home Page for the System
V. Case Study Results

We use qualitative methods to obtain as much data and information as possible for the evaluation of the system in this study. In this study, focus is partly on the perceptions and practices of the entrepreneurs regarding their knowledge and skills development. Responses from the population through the self-administered survey were solicited. These are based on the trustworthiness components used to evaluate the research results.

Table 2: Trustworthiness components

<table>
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<tr>
<th>Component</th>
<th>Description</th>
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<tbody>
<tr>
<td>Credibility</td>
<td>The trustworthiness of the findings of the qualitative research</td>
</tr>
<tr>
<td>Transparency</td>
<td>The transparency of the process and the ability to express certain factors that impact the qualitative</td>
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<table>
<thead>
<tr>
<th>Research Process</th>
<th>Usefulness</th>
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<tbody>
<tr>
<td></td>
<td>The ability to take the qualitative research findings in new insights and hypothesis for further investigation</td>
</tr>
<tr>
<td>Analyzability</td>
<td>the ability to analyze the qualitative research design outcomes with a high degree of confidence</td>
</tr>
</tbody>
</table>

Ninety (90) % of the participants were moderate to expert users when it came level of experience using the internet. 100% of the participates agreed that modules presented are relevant to their business and include interesting exercises. Almost all would recommend the program to their colleagues given that some colleagues would face internet connect and usage challenges.

The participants were graded based on their understanding of the content presented. The Quiz is graded, meaning a user is given a percentage score that is determined by his/her level of comprehension of the module. The participants graded relatively high after going through the content, which increased their knowledge and understanding of entrepreneurial skills concepts. Moodle uses quizzes to evaluate student understanding of course material. Moodle provides a wide range of questions and layouts which provide almost immediately feedback; it also provides tools for surveys.

VI. CONCLUSION

Entrepreneurial skill development and entrepreneurship education are important in the development of entrepreneurs and in creating active economies. From this research it’s been clear that most entrepreneurs have acquired the technical skills from previous working experience. From the entrepreneurial skill sets, management skills seem to be the skill which is lacked the most. Collaborative learning could improve skill-sets and competencies in entrepreneurs, but this could only be made possible if the appropriate technology and infrastructure are in place.

In emerging economies it’s important to develop policies that favor electronic learning and eliminate obstacles that prevent individuals from participating in the electronic learning environment. The entrepreneurial skill sets that also need to be developed despite the ones mentioned are: Customer-Orientated, Strategic Development, Human Resource Development, as well as training entrepreneurs to develop their entrepreneurial self-efficacy. The developed system could serve as a key component in training entrepreneurs to develop their entrepreneurial self-efficacy. This is confirmed by the evaluation of the developed system.

REFERENCES


