Effectiveness of Entrepreneurship Education on Entrepreneurial Orientation of Undergraduate Science Students in Rwanda

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List of abbreviations

ADF : African Development Fund

BIC : Business Idea Conceptualization

BIGS : Business Idea Generation and Selection

BLS : Biomedical Laboratory Sciences

BM : Business Model

BP : Business Plan

BT : Biotechnologies

CCEE : Cross Campus Entrepreneurship Education

CE : Civil Engineering

CG : Control Group

CR : Class Representative

CS : Computer Science

CV : Curriculum Vitae

DEST : Department of Education, Science and Training

DOL : Department of Labour

DOT : Decision learning, Opportunity awareness, Transitional learning

EDPRS: Economic Development and Poverty Reduction Strategies

EE : Entrepreneurship Education

EO : Entrepreneurial Education

EU : European Union

FESSM: Faculty of Economics, Social Sciences and Management

FSR : Farming System Research

GDP : Gross Domestic Product

GEL : Great Customer, Easy sale, Lifelong

HEI : Higher Education Institutions

HEQC : Higher Education Quality Council

HLI : Higher Learning Institutions

HoD : Head of Department

ICT : Information Communication and Technologies

ID : Identification Document

IEEP : International Entrepreneurship Educators Programme

ILO : International Labour Organization

INES-Ruhengeri: Institut d'Enseignement Supérieur de Ruhengeri

KMO : Kaiser-Meyer Olkin

LAM : Land Administration and Management

LCF : Laurillard's Conversational Framework

LS : Land Survey

MIFOTRA: Ministry of Labour and Public Service

MINEDUC: Ministry of Education

MMS : Macro and Micro Screening

M&E :Monitoring and Evaluation

N : Number

NISR : National Institute for Statistics of Rwanda

OECD : Organisation of Economic Cooperation and Development

PCA : Principal Component Analysis

PECs : Personal Entrepreneurship Characteristics

PLA : Participatory Learning and Action

PRA : Participatory Rural Appraisal

QAA : Quality Assurance Agency of Higher Education

RMA : Rapid Market Appraisal

SAE : Statistics Applied to Economy

SD : Standard Deviation

SMART: Specific, Measurable, Achievable, Realistic and Timely

STEM : Science, Technology, Engineering and Mathematics

SWOT : Strength, Weakness, Opportunity and Threat

TG : Treatment Group

UK : United Kingdom

UN : United Nations

UNCTAD: United Nations Conference on Trade and Development

UNESCO: United Nations Educational, Scientific and Cultural Organization

USEM : Understanding, Skilful, Efficacy and Metacognition

ZPD : Zone of Proximal Development

Zusammenfassung

Wirksamkeit der unternehmerischen Ausbildung zur unternehmerischen Orientierung von Studierenden der naturwissenschaftlichen Fächer in Ruanda

Hintergrund und Problembeschreibung

Die Zahl der Einschreibungen von Studierenden an den Hochschulen (HEIs) in Ruanda nimmt seit Jahren zu (MINEDUC, 2018). Gleichzeitig steigt die Arbeitslosenquote der AbsolventInnen, was viele von ihnen mit Perspektivlosigkeit konfrontiert (NISR, 2017). Auf der einen Seite erkennen Arbeitgeber und Pädagogen die Kluft zwischen dem Markt und der Beschäftigungsfähigkeit der Absolventen an. Sie rufen zu gemeinsamen Anstrengungen auf, um eine dauerhafte Lösung für dieses Problem zu finden. Auf der anderen Seite gibt es neue Marktveränderungen, die viele Institutionen vor die Frage stellen, wie sie ihre Politik und Strategien zur Kompetenzentwicklung am besten und schnellsten strukturieren können (Corominas, 2010). Es liegt auf der Hand, dass die Arbeitgeber während des Einstellungsprozesses nach Absolventen suchen, die über spezifische Fachkenntnisse verfügen. Gleichzeitig sind sie auch an Absolventen mit fortgeschrittenen unternehmerischen Fähigkeiten, Verhaltensweisen und Wertvorstellungen interessiert. Es wird davon ausgegangen, dass unternehmerisch denkende Absolventen einen unmittelbaren Einfluss auf die Wettbewerbsleistung des Unternehmens haben, sich leicht an neue Umgebungen anpassen können und Unsicherheiten, die durch neue Veränderungen der Marktstrukturen entstehen, bewältigen können (Kelley et al., 2011). Um das Qualifikationsdefizit zu verringern, empfahlen die Regierung Ruandas und die Hochschulen die Förderung von unternehmerischer Denken und Handeln als eine Option, die sowohl die Beschäftigungsfähigkeit als auch die unternehmerischen Kompetenzen der Absolventen berücksichtigt.

Die Entwicklung der unternehmerischen Fähigkeiten kann durch die unternehmerische Orientierung (EO) gemessen werden. EO beinhaltet Absichten und Maßnahmen, die Risikobereitschaft, Autonomie, Proaktivität, Innovationsfähigkeit und Wettbewerbsaggressivität beinhalten. Es wird argumentiert, dass die Entwicklung von EO die Fähigkeit von Unternehmen und Einzelpersonen erhöht, mit Unsicherheiten umzugehen, die das Umfeld, in dem Unternehmen tätig sind, kennzeichnen. Sie hilft auch, strategisch und schnell fundierte Entscheidungen zu treffen, die sich auf die Leistungs- und Wettbewerbsfähigkeit auswirken (Lumpkin and Dess, 1996; Rauch et al., 2009; Rosenbusch et al., 2013)

Es ist Konsens, dass die Bildung unternehmerische Fähigkeiten und Kompetenzen entwickeln sollte. Diskutiert werden die Inhalte dessen, was gelehrt oder gelernt werden muss sowie die didaktischen Methoden (Mwasalwiba, 2010). Die Methoden variieren, aber die Literatur zeigt, dass der traditionelle Ansatz (Entwicklung eines Geschäftsplans) dominiert. Er wurde kritisiert, weil er Management- und Prozessfähigkeiten entwickelt hat, anstatt eine kreative Denkweise zu entwickeln, die die Natur der Unternehmensarbeit erfordert (Cooney, 2012).

Studien zur Förderung von unternehmerischem Denken und Handeln in Ruanda zeigten ein (1) Defizit an Lehrplänen für unternehmerisches Denken und Handeln, da diese zu theoretisch seien. (2) Einen Mangel an Lehrkräften, die in unternehmerischem Denken und Handeln ausgebildet sind. (3) Außerdem ein Fehlen an unterstützenden Maßnahmen für einen effektiven Unterricht. Zudem besteht ein Defizit an praktischen Konzepten und Werkzeugen, die proaktive, interaktive und kreative unternehmerische Fähigkeiten und Denkweisen fördern (Honeyman, 2016; Malunda, 2014).

In dieser Studie konvergieren die neuen Lehrmethoden und Vermittlungstechniken für unternehmerisches Denken und Handeln mit dem Handlungs- oder Erfahrungslernen als Alternative zum klassischen Businessplan. Sie sind eingebettet in die Action-Learning-Theorie und die Erwartungstheorie (Gibb & Price, 2014; QAA, 2018). Beide Theorien sprechen letztlich für die Handlungs- und Erfahrungsforschung (Saunders et al., 2009). Die Action-Learning-Theorie nutzt das Potenzial, das Menschen im Umgang mit schwierigen Herausforderungen und Problemen durch eigene Lernerfahrungen besitzen. Sie erkennt an, dass individuelle Entwicklung durch erfahrungsorientiertes Lernen stattfindet. Letzteres folgt pragmatischen Ansätzen, bei denen Individuen zusammenkommen, um sich gegenseitig in Aktion und Lernen auszutauschen, zu unterstützen und herauszufordern. Mit Action-Learning verbunden ist die Aktionsforschung, die zyklische erfahrungsorientierte Lernprozesse durchläuft; sie verwendet partizipative, qualitative und reflektierende Ansätze. Wir sollten uns daran erinnern, dass die Handlungen der Menschen von erwarteten Konsequenzen getrieben werden, die meist ökonomisch motiviert sind. Der Grad des individuellen Engagements in die Handlung ist immer durch den erwarteten Nutzen motiviert (Erwartungstheorie) (Renko et al., 2012).

Das neue handlungsorientierte Modul baut auf verschiedenen Lehransätzen auf. Lehrende und Lernende nehmen unterschiedliche Positionen ein und spielen unterschiedliche Rollen im

Lernprozess. Daher können die Vermittlungstechniken als lehrerzentriert (Frontalunterricht - Businessplan-Modul) oder studentenzentriert (handlungs- oder erfahrungsorientiertes Lernen- neue Modul) klassifiziert werden. Aktuelle Trends in der Bildung argumentieren, dass die Studierenden besser lernen, wenn sie aktiv sind und Verantwortung in einer freien, flexiblen und freundlichen Umgebung übernehmen. Hier agiert der Lehrer wie ein Moderator und nicht wie ein Ausbilder im Lernprozess (Gibb and Price, 2014; Laurillard, 2013).

Forschungsziel und Hypothesen

In diesem genannten Rahmen sollte ein neues handlungsorientiertes Modul für Studierende der Naturwissenschaften in Ruanda entwickelt und getestet werden. Ziel war es, die Auswirkungen der Ausbildung zu unternehmerischem Denken und Handeln auf die unternehmerische Orientierung der Studierenden zu bewerten. Das Businessplan-Modul wurde neugestaltet und an eine Kontrollgruppe vermittelt. Bei der Gestaltung beider Module wurden gemeinsame Konzepte und pädagogische Ansätze verwendet: Entrepreneurship und Intrapreneurship, die einer instruktiven Methode entsprachen; Business Ideenentwicklung und Auswahl, die einer instruktiven und erfahrungsorientierten Methode entsprachen. Beide Module unterschieden sich in anderen Komponenten. Das Businessplan-Modul deckte anhand seiner instruktiven Methode verschiedene "Komponenten" ab. Das handlungsorientierte Modul umfasste die Geschäftsmodell-Generierung (erfahrungsorientierte Methode) und die schnelle Marktbewertung unter Verwendung von partizipativen Lernaktionen, explorativen und investigativen Methoden.

Es wurden zwei Hypothesen aufgestellt. Erstens wurde ein positiver Zusammenhang zwischen den gelehrten Entrepreneurship-Modulen und der unternehmerischen Orientierung der Studierenden angenommen. Zweitens die Annahme, dass das neue handlungsorientierte Modul höhere Auswirkungen auf die Werte und Kompetenzen der Studierenden in Bezug auf die unternehmerische Denkweise hat als das traditionelle Businessplan Modul. Nach der Analyse der Ergebnisse wurden beide Hypothesen bestätigt.

Forschungsmethodiken

In diesem Erfahrungs- und Aktionsforschungsprozess wurde eine Mischung aus qualitativen, quantitativen und Beobachtungsmethoden zur Datenerhebung eingesetzt. Gezielt wurden Studierende aus dem letzten Studienjahr bzw. Vordiplomjahren der Fachbereiche Bauingenieur-

wesen, Biotechnologie und Landesvermessung ausgewählt. Sie dürfen zuvor keine Ausbildung in der Entwicklung unternehmerischer Fähigkeiten besucht haben. Sie wurden nach dem Zufallsprinzip in zwei Gruppen aufgeteilt: die Kontrollgruppe (CG) (N=49), die das Business Plan Modul studierte; die Behandlungsgruppe (TG) (N=68), die dem neuen handlungsorientierten Modul folgte. Erhoben wurden qualitative Daten unter Verwendung der Literaturrecherche über EE anhand von (1) Lehrplanüberprüfung von Unternehmertumskursen am INES-Ruhengeri; (2) nicht strukturierte Interview; (3) Beobachtungen der Ausbilder über den gesamten Lehrprozess. Quantitative Daten wurden mit Hilfe eines standardisierten Fragebogens erhoben, der fünf EO-Dimensionen mit 23 Indikatoren abdeckt. Sie wurden auf einer sieben Likert-Skala gemessen, wobei 1 = Stark abweichend und 7 = Stark übereinstimmend war. Der Fragebogen wurde sowohl vor als auch nach dem Training an beide Gruppen verteilt; deskriptive und inferenzstatistische Analysen wurden mit Hilfe des SPSS.

Die Forschungsergebnisse

Die Ergebnisse in der deskriptiven und inferentiellen Statistik zeigten einen allgemein positiven Trend in der Veränderung der Mentalität der Studierenden nach dem Training. Verglichen mit der Einstufung vor dem Training waren die Unterschiede in den Mittelwerten bei 18 von 23 Indikatoren für den CG positiv. In der TG waren es 21 von 23 Indikatoren. Es wurde auch beobachtet, dass die Unterschiede in den Mittelwerten in 2 von 5 Dimensionen des CG (Risikobereitschaft und Innovationsfähigkeit) statistisch signifikant waren. In der TG waren sie jedoch in 4 von 5 Dimensionen (Risikobereitschaft, Proaktivität, Innovationsfähigkeit, Wettbewerbsaggressivität) signifikant. Obwohl das CG keine signifikanten Veränderungen der Proaktivität und der Wettbewerbs-aggressivität verzeichnete, verzeichnete die TG signifikante Veränderungen in denselben Dimensionen. Wir argumentierten, dass diese Unterschiede auf die Lehrmethoden und -instrumente der TG zurückzuführen sind. Sie drängen mehr auf partizipatives Lernen, Interaktion und Faktenfindung aus dem Marktumfeld. Auf der anderen Seite verzeichneten beide Gruppen keine statistisch signifikanten Veränderungen der Autonomie. Diese Dimension verzeichnete gleichzeitig die niedrigsten Durchschnittswerte in beiden Gruppen. Diese Situation kann auf den Lebensstil der Schülerinnen und Schüler zurückgeführt werden, der vor allem durch ein sicheres und stabiles Umfeld in der Hochschule gekennzeichnet ist. Hier sind sie nur mit sehr wenigen störenden Bedingungen konfrontiert, sie werden bei ihren Routinetätigkeiten von den Eltern und den aufnehmenden Einrichtungen unterstützt und geschützt. Sie sind nicht den Komplexitäten und

Erfahrungen des Marktes ausgesetzt. Sie kann auch von anderen lokalen Marktrealitäten beeinflusst werden, die die Schüler vor der Selbstständigkeit zurückschrecken lassen. Zu den Realitäten gehören finanzielle Unzugänglichkeit, Mangel an Startkapital etc. Das mangelnde Vertrauen in die Autonomie ist ein Signal, dass die Studierenden nach dem Studium eher dazu neigen, sich eher als IntrapreneurInnen zu betätigen statt selbst zu Gründen.

Die Ergebnisse zeigten auch, dass die proaktiven Indikatoren in Bezug auf "Aufbau neuer Beziehungen und Entwicklung gesunder Beziehungen" sowohl für die Kontroll- als auch für die Behandlungsgruppen höhere Durchschnittswerte vor und nach der Ausbildung aufwiesen. Die gleiche Situation ist für den Indikator "Zielerreichung" zu beobachten. Im Gegensatz zur obigen Situation verzeichneten die geschäfts- und marktbezogenen Indikatoren in beiden Gruppen niedrigere Durchschnittswerte. Die Befragten entwickelten kein relativ solides Vertrauen in solche Bereiche. Diese Ergebnisse zeigten die Notwendigkeit und Bedeutung der Einführung von marktorientierten Lernansätzen auf.

Im Ausbildungsprozess konnte beobachtet werden, dass die Liebe und das Festhalten an den eigenen Geschäftsideen eine wichtige Rolle dabei spielen könnten, den Lernenden Einfühlungsvermögen in die Welt des Unternehmertums zu vermitteln. Sie wollten, dass ihre Ideen für die weitere Entwicklung in Gruppenarbeiten ausgewählt werden. Dies war für viele eine Gelegenheit, eigene Geschäftsideen ohne zusätzliche Kosten zu entwickeln. Es konnte beobachtet werden, dass der Lernprozess im Businessplan-Modul im Vergleich zum neuen handlungsorientierten Modul etwas herausfordernd war. Die größten Herausforderungen waren das Lesen und Verstehen der Businessplan-Konzepte (die für viele Studenten neu waren); die Anwendung der Konzepte auf Gruppenideen innerhalb der vorgesehenen Zeit. Im Gegensatz zum Businessplan war der Lernprozess im handlungsorientierten Modul etwas einfacher, flexibler und unkomplizierter. Obwohl das neue handlungsorientierte Lernen flexibel, interaktiv und reflexiv ist, müssen die Unterrichtsstrategien über die Bewertung der Absichten der Studierenden in Bezug auf unternehmerische oder intra-unternehmerische Karriereperspektiven hinausgehen.

Empfehlungen und Beitrag für die Forschung

Die vorliegende Studie empfiehlt, kontinuierlich neue Wege der Lehre zu erforschen, die überwiegend auf erfahrungsorientierte Lernansätze setzen. Die Pädagogik sollte den Lernenden auch die Möglichkeit geben, Produkt- oder Dienstleistungsprototypen zu entwickeln

(evidenzbasiertes Lernen). Dies erfordert ausreichend Zeit für den Unterricht und, wenn möglich, auf einer Längsschnittbasis. Die Absolventen müssen auf die Landkarte der Wachsamkeit gesetzt werden. Schließlich sollte es Veränderungen in den Monitoring- und Evaluierungsstrategien des Lernprozesses geben.

Diese Studie leisten einen Beitrag zur Theorie und Didaktik unternehmerischen Handeln und Denken in der universitären Ausbildung. Sie stellt neue Kombinationen von innovativen Lernstrategien vor, die den Studierenden helfen können, in kurzer Zeit unternehmerische Fähigkeiten und Kompetenzen zu erwerben. Das neue Ausbildungsmodell kombiniert Konzepten und Werkzeuge, die in der Analyse von Geschäftsfähigkeiten und Wertschöpfungsketten verwendet werden, und beruht hauptsächlich auf partizipatorischem Lernen und Action Learning-Ansätzen.

Summary

Effectiveness of Entrepreneurship Education on Entrepreneurial Orientation of Undergraduate Science Students in Rwanda

Background and problem description

The students' enrollment in higher education institutions (HEIs) in Rwanda keeps growing (MINEDUC, 2018). There is also a simultaneous growth of graduates' unemployment rates which leaves many of them wonder for their future (NISR, 2017). On one side, employers and educators acknowledge the gap between market and graduates' employability skills. They appeal for joint efforts in providing a long-lasting solution to the issue. On the other, there are new market changes which leave many institutions wondering how best and fast they can structure their policies and strategies for skills development (Corominas, 2010). It is obvious that during the recruitment process employers look for graduates who possess specific curricula skills. They are also interested in graduates with advanced set of entrepreneurship skills, behaviours and mindset values. Entrepreneurially minded graduates are believed to make an immediate impact on the competitive performance of the organization; can easily adapt to new environments and they can survive uncertainties brought by new changes in market structures (Kelley et al., 2011). In order to reduce the skills gap, the government of Rwanda and HEIs recommended entrepreneurship education as an option that addresses employability skills as well as entrepreneurship competences.

Entrepreneurship skills development can be measured through entrepreneurial orientation (EO). EO involves intentions and actions related to risk-taking, autonomy, proactiveness, innovativeness and competitive aggressiveness. It is argued that developing EO increases the ability of firms and individuals to deal with uncertainties that characterize the environment in which businesses operate; it also helps to strategically and swiftly take informed decisions that impact the performance and competitiveness (Lumpkin and Dess, 1996; Rauch et al., 2009; Rosenbusch et al., 2013).

While there is no opposition to whether education develops entrepreneurship skills and competences, the major problem is on the content of what needs to be taught/learned, the methodologies (Mwasalwiba, 2010) and the ability of educators to develop creative curricula that meet the rigors of academia whilst keeping a reality-based focus and entrepreneurial climate in the learning experience environment (Solomon et al., 2002). Teaching methods vary but the literature

shows that the traditional Business plan dominates. It relies largely on theory and concept explanation plus demonstration of process steps. It has been criticized for developing management and process skills instead of developing creative entrepreneurial-like thinking that the current nature of enterprise work requires. From this critic, scholars appeal for new teaching approaches (Cooney, 2012).

Studies about entrepreneurship education in Rwanda have identified an entrepreneurship curriculum deficit (too basic in content and more theoretical); a deficit of teachers trained in how to teach entrepreneurship; and a deficit in supportive schemes for effective teaching. There is also a deficit in practical entrepreneurship concepts and tools that stimulate proactive, interactive and creative entrepreneurial skills and mindset (Honeyman, 2016; Malunda, 2014).

In this study, we focused much on the new entrepreneurship teaching methodologies and transmission techniques which converge on the action and experiential learning as an alternative to classical business plan. They are embedded in the action-learning theory and expectancy theory (Gibb & Price, 2014; QAA, 2018). The two theories appeal for action and experiential research in the end (Saunders et al., 2009). Action-learning theory capitalises on the potential that human beings have in dealing with difficult challenges and problems through own learning experiences. It acknowledges that individual development takes place through experiential learning. The latter follows pragmatic approaches where individuals come together to exchange, support and challenge each other in action and learning. Associated to action-learning is the action-research which goes through cyclic experiential learning processes; uses participative, qualitative and reflective approaches. As we are dealing with EO of students that involves their intentions and actions regarding the future, we also stress that actions of peoples are driven by expected consequences which are mostly economically motivated. The level of individual engagement into the action is always motivated by the expected benefits (expectancy theory) (Renko et al., 2012).

The new action-oriented module builds on different teaching approaches. Teachers and students occupy different positions and play different roles in the learning process. Therefore, transmission techniques can be classified as teacher-centred (instructive teaching mostly applied to business plan module in this study) or student-centred (action or experiential learning mostly applied to the new module). Current trends in education argue that students learn better when they are active and given

responsibility in a free, flexible and friendly environment. Here the teacher acts like a moderator and not like an instructor in the learning process (Gibb and Price, 2014; Laurillard, 2013).

Research objective and hypotheses

Within the above framework, the objective was to develop and test a new action-oriented module on undergraduate science students in Rwanda. The purpose was to assess the effects of entrepreneurship education (EE) on students' entrepreneurial orientation (EO). EO was measured through dimensions of risk taking, autonomy, proactiveness, innovativeness and competitive aggressiveness. The business plan module was redesigned and delivered to the same target group in a control group. In the design of both modules, common concepts and pedagogies included Entrepreneurship and Intrapreneurship which followed an instructive method; Business Idea Generation and Selection which followed instructive and experiential methods. Both modules differed in other components. The business plan module covered different "components" by following an instructive method. The action-oriented module covered the Business Model Generation (experiential method) and Rapid Market Appraisal using participatory learning action, exploratory and investigative methods.

Two hypotheses were made. First, we assumed a positive relationship between the taught entrepreneurship modules and students' entrepreneurial orientation. Second, we assumed the new action-oriented module induces higher effects on students' entrepreneurial mindset values and competences than the traditional business plan. After analyzing the findings, both hypotheses were confirmed.

Research methodologies

In this experiential and action research process, a mixture of qualitative, quantitative and observation methods were used for data collection. Targeted students were purposively selected from the final or prefinal years in departments of Civil engineering, Biotechnologies and Land Survey. They must have not attended any training in business skills development before. They were randomly split into two groups: the control group (N=49) which learned the business plan; the treatment group (N=68) which followed the New action-oriented module. Qualitative data were collected through: 1) literature review about EE, curriculum review of entrepreneurship courses delivered in different programs at INES-Ruhengeri; 2) not-structured interviews (3 program

managers and 3 class representatives); 3) trainers' observations of the whole teaching process. Quantitative data were collected using a standardized questionnaire covering 5 EO dimensions with 23 indicators. They were measured on a seven Likert scale with 1 = Strongly disagree and 7 = Strongly agree. The questionnaire was administered to both groups before and after training; descriptive and inferential statistical analyses were done using Statistical Package for Social Sciences (SPSS).

Research findings

Findings in the descriptive and inferential statistics showed a general positive trend in students' mindset change after training. Compared with how they ranked themselves before the training, the differences in the mean averages were positive in 18 out of 23 indicators in the CG. They were 21 out of 23 indicators in the TG. It was also observed that differences in the mean averages were statistically significant in 2 out of 5 dimensions in the CG (risk-taking and innovativeness). However, they were 4 out of 5 dimensions in the TG (risk taking, proactiveness, innovativeness, competitive aggressiveness). Although the CG did not register significant changes in proactiveness and competitive aggressiveness, the TG recorded significant changes in the same dimensions. We argued that such differences originate from teaching pedagogies and tools used in TG. They push more for participatory learning, interaction and fact finding from the market field. On the other side, both groups did not record statistically significant changes in autonomy. This dimension recorded, at the same time, the lowest mean averages in both groups. This situation can be attributed to students' lifestyle which is mostly characterized by a safe and stable environment at school. Here, they face very few disturbing conditions, they are supported and protected by parents and host institutions in their routine activities; they are not exposed to market complexities and experiences. It may also be influenced by other local market realities which make students shy away from self-dependency. The realities include financial inaccessibility, lack of start-up capital, weak and insufficient schemes for supporting entrepreneurial learning, especially curricula didactics. The lack of confidence in autonomy is a signal that, after graduation, students are more inclined to becoming intrapreneurial.

Findings also demonstrated that indicators related to "establishing new relationships and developing healthy relationships" recorded higher mean averages before and after training for both control and treatment groups. The same situation is observed for the indicator related to "goal

achievement". Contrary to the above situation, business and market related indicators recorded lower mean averages in both groups. Respondents did not relatively develop solid confidence in such areas. Such findings revealed the necessity and importance to introduce market-driven learning approaches. These motivate students' interaction with market players, they develop self-confidence, proactive and competitive behaviours and attitudes.

In the training process, it could be observed that the love and attachment to own business ideas could play an important role in instilling learners' empathy toward the world of entrepreneurship. They wanted their ideas to be selected for further developments in groups assignments. Those whose ideas were not selected requested for extra individual coaching. This was an opportunity for many to develop own business ideas without extra costs. It could be observed that the learning process in the business plan module was a bit challenging compared to the new action-oriented module. Major challenges were associated with reading and understanding business plan concepts (which were new to many students); applying the concepts to group ideas within the allocated time (8h/day in 7days). Contrary to the business plan, the learning process was a bit easier, flexible and straightforward in the action-oriented module. Though flexible, interactive and reflexive in nature, the new action learning requires more than just the understanding of entrepreneurship concepts and application of tools. Teaching strategies need to go beyond evaluating students' intensions in entrepreneurial or intrapreneurial career prospects. Pedagogies should give learners the opportunity to develop product or service prototypes as well. This requires enough time for teaching and, where possible, on a longitudinal basis. Another area of concern is where students must feel the world of entrepreneurship and be ready for opportunity detection and exploitation. As many students are still hopeful for employment after graduation even when evidences show the opposite, the graduates (soon to be) must be put on the map of alertness. This factor constitutes a major entrepreneurial trait that interacts with other factors.

Research recommendations and contribution

Following the discussions on the findings regarding the business plan module and the new action-oriented module, this study recommends to continuously explore new ways of teaching which predominantly use experiential learning approaches. However, there should be synergies between teaching and market environment for developing students' innovative, proactive and competitive mindset, behaviours and competences. Furthermore, we recommend that EE objectives and

intended purposes of learning should be well streamlined. There should also be enough time for practical teaching and learning. Students will learn theory and skills and will have time to apply them to produce proof of concepts (evidence-based learning). Lastly, there should be changes in monitoring and evaluation strategies of the learning process.

This study contributes to the theory and didactics of entrepreneurial action and thinking in university education. It introduces new combinations of innovative learning strategies that can help students acquire entrepreneurial skills and competences in a short time. The new training model combines concepts and tools used in business skills and value chain analysis and rests mainly on participatory learning and action learning approaches.

1. CHAPTER ONE: INTRODUCTION

1.1. General background to the problem

Individuals acquire from different sources (family, school, workplace, etc) knowledge, skills and attitudes that shape and determine how they survive in various environments including market and employment. Knowledge and skills acquired at higher education institutions (HEIs) tend to be more specific so that after graduation they can be applied to yield specific results. However, given the changes in the market environments, disciplinary knowledge (in science subjects) is judged vital for some employers (Adelman, 2001) while general knowledge (in social sciences) is deemed sufficient for others (HEQC, 1997). On top of specific and general knowledge/skills, graduates with entrepreneurial mindset have a competitive advantage that applies well in setting up own enterprises or in helping existing organizations to perform better as employees.

In the employment arena some graduates may take longer to materialise their performance in the working environment while others become immediately productive soon after they join it. For an employer, the choice seems simple as the latter category of immediate producers comprises the most sought-after university products. Graduates with relevant knowledge and skills increase the potential for obtaining a graduate job (Yorke & Knight, 2006) and the relevance should be understood as the right competences, in the right place and at the right moment. In principle, such employability potentials are expected in any graduate and the recruiting organizations believe that academic institutions equip students with sufficient skills that meet the basic criteria for recruitment.

Based on tertiary education enrolment statistics collected globally by the UNESCO Institute for Statistics (UIS), Calderon (2018) demonstrates that there is a growing number of youths accessing education. Africa and Rwanda in particular show that this trend in higher education enrollment will continue for some time due to its younger population. In some countries including Rwanda, the access to education comes with joy and resentment at the same time. Governments and people are happy that education is reaching many, but levels of graduates' unemployment raise questions about career future. Having realized this controversy, on top of disciplinary skills that graduates learn and master for their future careers, governments are investing large sums of money in programs that aim at increasing graduates' potential for employability beyond their academic

scope. Amongst such programs entrepreneurship (to be developed later) is believed to enhance skills that are needed for employment entry and sustainability.

1.1.1. The growth of Higher Education from global to African perspective

Tracing back from 1970s, there has been a global phenomenon in the rise of the number of institutions and graduates in tertiary education. A lot of investments were put into education as a belief that education is the engine of development and, most importantly, is a basic right that everyone should enjoy. In summary, during the 1970s alone the number of universities in the world doubled (Bornstein and Davis, 2010). From 1970 till beginning of 21st century, university students worldwide increased by more than 300% (Wolf, 2002); in 2007 global enrolment and graduates in higher education totaled about 132 and 22 million respectively (UNESCO, 2009). It is projected that by 2040 the global students' enrollment will be 594.1 million from 32.6 million students in 1970. Not only students' enrolment increased globally but also the expansion of higher education institutions in numbers occurred as well. In 2016 it was estimated at 14,000 as recorded by the International Association of Universities to over 20,000 as noted by Webometrics (Calderon, 2018).

In Africa students enrolled in tertiary education were less than 200,000 in 1970 but around 10 million in 2015 according to the 2016 Times Higher Education rankings[1]. Between 2000 and 2016, the annual growth in enrolments in Sub-Saharan Africa (6.7%) was above the world's average (4.9%) and equal to that of East Asia and the Pacific. In 2000, there were 2.6 million students enrolled in higher education (2.6% global share), increasing to 7.4 million by 2016 (3.4% global share). As the global enrolments are expected to continue rising, Africa will experience such strong growth as more and more countries in the region make advances in strengthening their national systems of education and attain higher completion rates in secondary education. Based on the UIS (2018) and UN (2017a) data, enrolments are expected to increase from 7.4 million in 2015 to 8.8 million by 2030 and 21.7 million by 2040. Despite the growth of the number of students per 100,000 inhabitants expected to rise from 766 in 2015 to 964 by 2030 and 1,227 by 2040, Sub-Saharan level will remain at the bottom among all world regions from 2015 to 2040 (Calderon, 2018).

[1] https://blog.politics.ox.ac.uk/higher-education-in-africa-four-key-challenges/ retrieved sept 2019

1.1.2. Higher education enrollment in Rwanda and the graduates' employment challenges

A closer look at Rwanda's educational sector in the last two decades recognizes similar growth in students' enrolment. However, it comes with certain challenges. This is a sector that constantly went through reforms for meeting national, regional and international competitiveness in both education and employment, but constrained with insufficient facilities and resources that should increase at the same or higher degree as the students' enrolment. Rwanda which had only one university in 1963 with 43 students recorded 5,551 students in academic year 1997/8[2], registered 54 HEIs in 2017 with 91,193 students (10 public and 44 private institutions). In a short period of 4years the number of institutions grew from 31 in 2013 to 45 in 2015/16 (Mbabazi, 2013; MINEDUC, 2018). On one hand, reforms that were initiated included liberalisation of educational sector, education for all, revision of curricula as well as the medium of instruction… Such reforms resulted in an abrupt multiplication of academic institutions (public and private) and their graduates. Simultaneously, political influence on education that increased through the declaration of education as every citizen's right saw the new policy of free Twelve-Years Basic Education resulting into an increased access to education by all and at all levels. It therefore continuously increased inflow of students from high school to higher education. On the other hand, reforms that were perceived as a solution to illiteracy and low academic qualification created another problem: not only did they increase the number of unemployed people but also scepticism about the quality of skills acquired. Put differently, the more the number of university graduates increased, the wider the gap between competences acquired and competences required by recruiters/employers. The private sector complained about the employment readiness of university graduates; it appealed the government to look into the matter while it kept, in the meantime, importing labour force from the region and beyond (MIFOTRA, 2013; MINEDUC, 2013).

With the present trend of growth in HEIs enrolments and graduates, it is almost impossible for all graduates to find employment because labour markets are unable to accommodate this large group of skilled labour force. Also many countries including Rwanda failed to closely link the educational system to the needs of the labour market and to the large numbers of youth now reaching the working age. As a matter of fact governments are commendable for their efforts to

[2] https://www.k12academics.com/Education%20Worldwide/education-rwanda. Accessed on 18 December, 2019

make education accessible for all; but the use of higher education as a tool for solving labour market problems without proper mechanisms and sufficient means to turn graduates into active workers has caused the unemployed labour force to rise (Erdem & Tugcu, 2012); each graduate has become a potential member of the army of jobless which, consequently, can increase the unemployment rates.

Still in the same context, although the ADF (2014) argued that Rwanda made notable progress in skills development, critical challenges regarding skills gaps and mismatch as well as low labour productivity persisted. The statistical yearbook 2017shows that graduates from tertiary education generally lack technical skills that respond to market needs; quality of most science, technology, engineering and mathematics (STEM) and social science courses is often criticized for being "too theoretical" and less applicable to the job market; which partly explains why so many STEM graduates remain unemployed in Rwanda (NISR, 2017). Only 6% of university students are enrolled in technical disciplines such as engineering and just 9% are studying sciences, which are considered low numbers by international standards. Skills gap is not only seen in students but also in teachers as they frequently lack practical experience, which does not help to bridge the gap between academia and the job market.

Not only skills gaps are reported but also high rates of unemployment demonstrate another negative image. Studies and reports show that the country produces a big number of university graduates not corresponding to its job supply capacity (MIFOTRA, 2013). The unemployment rate rose from 3.4% in 2012 to 16.7% in 2017 (NISR, 2017); the employment provided by the government is less than what is expected to fill in that gap both in terms of quantity and quality (MIFOTRA, 2013) and; the higher the educational attainment of a young person, the higher the risk of unemployment. Unemployment statistics of 2017 show this picture as follows: primary- 16.3%; lower secondary- 22.2%; upper secondary- 26.3%, and university- 15.9%. As it is argued, the more the number of people gets education in Rwanda, the more the increase in unemployment tendency. They want to find good jobs in offices, with good salary and abandon it when they do not find a job meeting such desires (NISR, 2017). Further analysis can trace this situation back from the weak linkages between academia and job markets. Linkages between universities and industry for skills development and practical training are weak, thereby deterring both sides from benefiting from each other. On additional note, HEIs face the challenge of making proper and timely alignments between academic curricula and employment requirements. One may think that

if HEIs could make such alignments, it would eliminate mutual accusations that are related to mismatches between university graduates and market skills requirements. Depending on their resources HEIs can produce a big number of graduates as they can but the final appreciation of their quality will always lie in the hands of the absorbing market. It is therefore possible to argue that industrial attachments can fix skills mismatch problem but that also would require satisfying three important conditions: liaison between educationists and industries in the design and delivery of education; enough industries with sufficient capacity to absorb trainees/interns; policy decision-making structures that are fast to track and react against market changes. In other words, this implies foreseeing how technology and the markets will evolve.

But still some questions will arise especially those related to the ability of the organization to predict for the future and the exactness of predictions: Should concerned institutions gather all information regarding job duties, content and responsibilities? Will they be capable of predicting the changes that jobs will undergo in the future and the number of people who will be necessary to fill them? (Corominas et al., 2010).

Assuming that concerned institutions manage to collect the data, other challenges including the speed at which competition drives changes in the markets, the nature of work that keeps changing from employee as well as employer's perspective, etc. raise scepticism about the sustainability of the strategy. Today the primary nature of work is no longer centred on the industrial revolution; workers are more distinguished by knowledge-oriented requirements rather than physical ability. They are no longer guaranteed long-term employment with one company and, they encounter a more contingent workforce compared to past generations who depended on one or two sole employers to provide their main economic security (DOL, 1999). It therefore requires decision-making bodies to strategically develop employability skills that can match market requirements.

1.1.3. Matching graduates' employability and employment market skills

Understanding the convergence between employability skills and market/entrepreneurship skills is fundamental as far as graduates' prospects are concerned. Graduates will evolve in an enterprise that requires sound specific employability skills coupled or supplemented with sound market/entrepreneurship skills. Employability skills are defined as skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to enterprise strategic directions (DEST, 2002). While relating

employability and entrepreneurship, entrepreneurship is put into three categories including Entrepreneurship Skills (e.g. inner discipline, ability to take risk, innovative, change-orientated, persistence etc), Technical skills (e.g. planning, decision-making, motivating, marketing, finance, selling…) and, Management Skills (e.g. operations specific to industry, communications, design, research and development, environmental observation) (Cooney, 2012). To be successful in the employment market, an employable and entrepreneurial graduate should possess knowledge as academically prescribed in curricula plus skills that are usable for business performance after graduation (as employed or self-employed). Without necessarily being specialists in entrepreneurship, graduates' ability to apply such skills upon their academic backgrounds is paramount for career development.

Collaboration between academia and industry is one of the key success factors for graduate entering employment markets. Such collaboration targets the development of employability skills that the human capital utilizes to respond to market needs. Such skills are relevant for entry-level as well as established employees. They can be prioritized or adapted to suit various job-roles. In the teaching/learning process, graduate students and educationists are advised to identify key skills for making somebody employable across the range of business contexts including small, medium and large enterprises; understand that employability is not only what individuals can (capacity) but also who they are (personality/attributes and preferences) (DEST, 2002; Potgieter & Coetzee, 2013).

Employability presupposes pro-active career behaviours and capacities that help people to fulfil, acquire or create work through the optimal use of both occupation-related and career meta-competencies (Schreuder & Coetzee, 2011). Explicitly, Hillage and Pollard (1998) model reflects this idea in four main elements: a person's "employability assets" (knowledge, skills and attitudes), "deployment" (career management skills, job search skills), "presentation" or job getting skills" (CV writing, work experience and interview techniques), "personal circumstances" (for example family responsibilities) and "external factors" (for example the current level of opportunity within the labour market) (Hillage & Pollard, 1999).

If graduates are to be successful in employment positions, Bennett et al. (1999) proposed a model that stresses a range of factors to be reflected in the courses: disciplinary content knowledge; disciplinary skills; workplace awareness; workplace experience; and generic skills (Bennett et al.,

1999). Yorke and Knight (2004) developed another model known as USEM which is centred on Understanding, Skilful practices, Efficacy beliefs and Metacognition. In his arguments, Yorke is convinced that employability is evidenced in the application of a mix of personal qualities and beliefs, understandings, skilful practices and the ability to reflect productively on experiences. Therefore, it becomes a life learning matter. Understanding refers to aspects of remembering facts, understanding concepts, applying the understandings to relatively routine problems that do not call for innovative thinking, and analysing situations and bring critical evaluative skills to bear on, for example, the literature (Yorke & Knight, 2006)

Skilful practices encompass both the practices needed for the deployment of disciplinary expertise and the generic practices (self-management, capacity to work productively with others, awareness of internal politics of organisation, the ability to manage divergent points of view and the ability to determine what is possible in a given situation) that enable disciplinary expertise to be applied effectively in the employment arena (Knight and Yorke, 2004). Lowden et al. (2011) and Hermans (2007) argue that such skills are needed in order to cope with the current work life which increasingly demands movement between jobs, organisations, contexts and cultures due to the popularity of short-term employment contracts and increased mobility of business. In such circumstances, graduates are required to demonstrate a range of broader skills and attributes such as teamwork, communication, leadership, critical thinking, problem solving, managerial abilities, and creativity. Such a range of competences is needed to compete internationally, work in a global environment, in different countries, and in multi-cultural teams (Lowden, Kevin; Hall, Stuart; Elliot, Dely; Lewin, 2011; Mbabazi, 2013).

With regards to metacognition, the focus is on awareness of what one knows and can do and how one learns more. Mbabazi (2013, p.23) says: “In an educational context, good learning is conceived as when students can develop the capacity for self-regulation such that they are capable of recognising and responding appropriately to the demands of the situation confronting them. As employability becomes constructed as lifelong achievement and as a subset of and fundamentally contingent on transformative lifelong learning, people must take responsibility to become constant learners.” In the spirit of developing students’ lifelong learning habits, higher education institutions face an increasing demand of an education that enables students to develop skills that will serve as a foundation and basis for future learning and development. This type of education must allow them to update their knowledge not only when necessary but also to continue to do so

throughout their working lives. It is argued by Strivens and Grant (2000) that learners accurate awareness of their levels of achievement in employability skills, in conjunction with a desirable skill profile for a job or a range of jobs, allows them to recognise when and where they need to improve their level of skill (Mbabazi, 2013).

Apart from Knight and Yorke, employability gained attention from Watts (2006, p.9-10) who developed the DOT model. This model is believed to facilitate individuals to organize the complexity of learning for career development into a manageable framework. This management aspect frequently discussed in entrepreneurship studies focuses on Decision learning – decision making skills, Opportunity awareness – knowing what work opportunities exist and what their requirements are, Transition learning – including job searching and self-presenting skills, self-awareness – in terms of interests, abilities, values, etc. Though simple as it looks, critics find the model as mechanistic matching of the person and environment, and therefore underplay other critical issues such as social and political contexts (McCash, 2006). In their analysis on employability attributes and personality preferences, Potgieter & Coetzee (2013) refer, in their study, to Bezuidenhout (2011) and Myers et al. (2003) to argue that it is under such intersections that individual personality/attributes and preferences interfere for increasing the likelihood of securing and sustaining employment opportunities. The attributes are moderated by personality attitudes or preferences for peoples to understand their own and others' psychological or personality types and the use of their natural personality preferences of mental or cognitive functioning in their everyday lives. They conclude that evidences show that people's employability attributes relate significantly to their personality preferences. In practice, employability skills, attributes and preferences play an important role in determining the future of graduates as employees or employers; in market they determine the level of ability to deal with market needs

To successfully navigate into the employment market environment, employable individuals need to possess entrepreneurial drive, initiative and determination which are supplementary skills to what successful entrepreneurs share. This is necessary because contemporary business leaders prefer workers with an entrepreneurial spirit; they seek to hire entrepreneurially minded employees (Morris and Kuratko, 2002). As the choices of employers become clear, (aspiring) workers must seek opportunities to enhance their creative skills and become more proactive rather than reactive to environmental changes (Studdard et al., 2013). Within any society it is important

to support all people with entrepreneurial mindsets, not just focussing on entrepreneurs alone, as they each have the potential to inspire others to start a business (Kelley et al., 2011).

Considering the field of application of entrepreneurship skills and their close relationships and overlap with employability skills, developing entrepreneurship skills leads to enhancement of both disciplinary and market competences. It is therefore important to highlight the important interplay between entrepreneurship and employability skills within the environment of employment and market skills development.

Like discussed above, knowledge and skills developed through entrepreneurship can be used for individual or collective benefits. Individually they can apply to setting own venture (self-employment/ traditional entrepreneurship) and; collectively they can be used for the performance benefit of established organizations (employment by others/Intrapreneurship). When checking the knowledge, skills and attitudes utilized in both cases, the difference is only that they serve a similar purpose in different environments. That is why individuals can shift from one status to the other and still use the same skills, qualities and competences successfully. This situation reflects the fact that education can enhance both entrepreneurship and employability skills simultaneously. In fact, there is an overlap between the broad set of skills, attributes and competencies that contribute to graduate employability and the characteristics of enterprise. The overlap is found in *Behaviours* (e.g. taking initiative, taking responsibility, reflecting, risk management, networking), *Attributes* (e.g. curious, open mindedness, proactiveness, determination, resilience, self-efficacy) and, *Competencies* (e.g. creativity, problem identification and solving, negotiations, influencing, leadership, business and finance awareness) (QAA, 2018).

Given that in many countries there remain few opportunities for young graduates to find jobs that correspond exactly to their levels of educational attainment, which results in overabundance of students graduating with degrees but facing insufficient number of jobs available (UN Economic Council, 2003); given that unemployment tends to be higher among young people than among adults, which also results in the existence of "job queues" whereby new entrants to the labour market may find themselves waiting at the back of the line for jobs because employers often prefer experienced workers; both cases appeal for appropriate measures that tackle unemployment challenges- whether in self-employment or employment by others. Effective entrepreneurship skills development programs are therefore key to ensuring that young people acquire competences

and skills they need to pursue entrepreneurship and to lay the groundwork for developing a culture of entrepreneurship (UNCTAD, 2015) and intrapreneurship at large.

By remembering that the learning and/or working environments associated with the type of education delivered distinguish qualities of university graduates vis-à-vis employment market conditions, preparing somebody for lifelong learning and success in employment needs appropriate learning pedagogies. An effective approach to employability and entrepreneurship education exerts a significant impact on the learning-to-learn. It also prepares learners for a rewarding professional life and acts as a significant vehicle to deliver against the institutional aims for graduate employment, employability and future success (QAA, 2018).

1.1.4. Entrepreneurship skills development

Traditional definitions of entrepreneurship have laid emphasis on the process, action-oriented management style which take innovation and change as the focus of thinking and behaviour. Modern definitions of entrepreneurship are slowly shifting from economic and business centred definitions (though still very influential) (Hope, 2016). Personal traits, sociology and business interests seem to merge in recent years in an interest for entrepreneurial activities that encompass a social responsibility by focusing on other goals and values than purely economic gain. No matter the direction of the evolution of the perceptions of entrepreneurship, successful entrepreneurs share skills and characteristics which need to be adapted to different environments. Such skills can apply when setting own enterprise or working for an existing one.

Looking at what they do and how they behave, successful entrepreneurs share some traits or personality characteristics. Such traits include: 1) Need for achievement which manifests itself in various ways including risk taking, confidence of success, desire for independence, energy in pursuing goals, and measurement of success by wealth. Such personalities are significantly influenced and shaped by the surrounding environment and largely by parents as children are likely to have parents who expect them to be self-reliant at an early age, while remaining supportive and not rejecting their offspring. 2) Need for autonomy which reflects strong desire for independence, the freedom to create own futures. 3) Locus of control which is the belief in own ability to influence the environment in which we find ourselves. Individuals who believe they can control the environment are said to have internal locus of control as opposed to those with external locus of control who believe their lives depend on chances and fate. 4) Risk taking

propensity whereby entrepreneurs are often characterized as individuals who instinctively know that gains do not accrue to those who always play safety first. 5) Self-efficacy which reflects individuals' belief in own ability to undertake and accomplish some particular tasks or activities. While many management tasks are carried out according to some existing formula or expectations, the entrepreneur is breaking new ground. Identifying a good business opportunity (i.e. one that no one else has already spotted) requires self-belief (Drucker, 1985; Kuratko, 2005).

Entrepreneurship skills development underscores the importance of understanding how personality characteristics and skills discussed above intervene in helping and supporting enterprises to create valuable solutions (products, services or processes) to market problems. It is evident that when developing skills for students the mandate of the training institutions should also concentrate on preparing, developing and producing entrepreneurially minded graduates (Kelley et al., 2011). Kelley et al. are convinced that any educational training should enable people not just to develop skills to start a business but rather to be capable of behaving entrepreneurially in whatever role they take in life. Although the approach is quite broad, it captures the critical philosophy of modern entrepreneurship education (EE) and training programmes required if countries are to generate an increasing pool of people who are willing to behave entrepreneurially. Entrepreneurship education (which is developed in chapter 2) reflects entrepreneurship programs and courses that provide the context and content to help students learn and apply skills and behaviours intended to create value in entrepreneurial firms.

Entrepreneurship as a crosscutting discipline can be used as a tool for supporting knowledge and skills development relevant for active learning and performance within a company. It can also apply as a tool for changing the educational system towards ends. By laying emphasis on the last point, entrepreneurship is not just a tool for teachers and researchers; it has become a tool for organizations and governments to implement changes in different societal systems such as education (Hope, 2016).

1.1.5. Entrepreneurship skills development and Entrepreneurial orientation

Developing entrepreneurship skills comes back to developing learners' entrepreneurial orientation (EO). The concept of entrepreneurial orientation refers to processes, practices, and decision-making activities that lead to new entry, and "involves the intentions and actions of key players functioning in a dynamic generative process aimed at new-venture creation" (Koe, 2013;

Lumpkin & Dess, 1996). The determinants of EO are almost similar to those of entrepreneurship and can be very useful when measuring the effect of EE on students. In actual sense, EO dimensions are used in this study to measure the effectiveness of entrepreneurship education on students' EO.

EO comprises five dimensions including risk taking (incurring heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace), proactiveness (taking initiative by anticipating and pursuing new opportunities and by participating in emerging markets), autonomy (ability and will to be self-directed in the pursuit of opportunities), innovativeness (tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes), and competitive aggressiveness (propensity to directly and intensely challenge competitors to achieve entry or improve position, that is, to outperform industry rivals in the marketplace) (Lumpkin & Dess, 1996).

By developing entrepreneurship skills, educators enhance entrepreneurial orientation of students as well to become able to handle uncertainty and even find opportunities in such uncertainty. Such students can take initiatives and solve problems with limited information available; can deal with time pressure and complex problems; go beyond their direct tasks; connect and explore networks; defend their ideas and take risks for the greater benefit of all (Segers & Stalte, 2012)

1.1.6. Entrepreneurship education

1.1.6.1.Entrepreneurship Education as a targeted cognition and skills development

It can be difficult for any entrepreneurial ecosystem to flourish if people do not have the skills and know-how required to start companies and run them effectively or work for companies and make them successful performers. In modern times, there is no doubt that entrepreneurship can be taught. Drucker (1985) argued that entrepreneurship is a practice, it's not magic; it's not mysterious; and it has nothing to do with genes. It's a discipline and, like any discipline, it can be learned. Cooney (2012) concurs with Drucker's position and sees education and training playing a key role in its development. For Cooney there should be a shift from training that is centred on "creation of a business" as an outcome (argued that the skills required to achieve this outcome could be developed through training) to the "way of thinking and behaving" that is relevant to all parts of society and the economy (such an understanding of entrepreneurship now requires a

different approach to training). He further argues that contemporary needed educational methodology is one which helps to develop an individual's mindset, behaviour, skills and capabilities and can be applied to create value in a range of contexts and environments from the public sector, charities, universities and social enterprises to corporate organisations and new venture start-ups. Put differently, it is that educational methodology that captures entrepreneurship and intrapreneurship altogether.

Antoncic and Hisrich (2001) underscore that the concept of intrapreneurship should be looked at through the lenses of values and organizational behaviour. Under values, the intrapreneur needs an open and quality communication, existence of formal controls, intensive environmental scanning, management support, and organizational support. For the organizational behaviour, organisations need to engage in new business venturing, innovativeness, continuously renew themselves and proactiveness (Antoncic & Hisrich, 2001). Thus, for successful intrapreneurship, employees need free, secure and conducive environments that permit them to apply their entrepreneurial competences, but most importantly, facilitating creative thinking and idea experimentation. In such a situation, not only will employees expand their knowledge and skills but also will contribute to the collective good as well as individual wealth.

In the definition of entrepreneurship education, the teacher and the learner take the centre stage with distinctive roles. The knowledge/skills transmission approach determines the relationship between the two and adds more/less substance depending on the objectives to attain. According to Isaac et al. (2007), entrepreneurship education is defined as the purposeful intervention by an instructor in the life of the learner to impart entrepreneurial qualities and skills to enable the learner to survive in the business world. On the other side, Alberti, Sciascia and Poli (2004) cited by Chimucheka (2014, p.406) defined entrepreneurship education as the structured and formal transmission of entrepreneurial competencies, which in other words, refers to the skills, concepts and mental awareness used by individuals during the process of starting and developing their growth oriented ventures

Reference made to Gibb (2002), Küttim et al. (2014) explain that entrepreneurship education (EE) will, in a broader and modern sense, prepare not only "an entrepreneurial person" who may become self-employed (owner of an enterprise), but also is able to pursue entrepreneurship and innovation as an employee; and/or exhibits "enterprising behaviour. In a narrow or traditional

sense, entrepreneurship education will prepare a person capable of opportunity recognition, marshalling of resources in the presence of risk, and building a business venture. It only requires a collection of formalized teachings that focus on informing, training, and educating anyone interested in business creation or small business development. Chimucheka (2014) concurs with Wickham (1998) who argued that learning to be entrepreneurial is like learning to do anything else. It is just a form of behaviour, and behaviour is learnt. It is not a genetic issue because genes alone do not determine who becomes a successful entrepreneur.

With EE, students get and increase competencies to lead a rewarding, self-determined professional life; they are well placed to add significant social, cultural and economic value to society through entrepreneurial activity throughout their careers. In principle all students should have an opportunity to engage with enterprise and entrepreneurship, and to align it with their subject(s) of choice. This enables them to identify and seek out new opportunities; have higher aspirations in their careers; be resilient; and better adapt to change (QAA, 2018). EE aims to build upon "entrepreneurship" - the enterprising competencies of students who are capable of identifying opportunities and developing ventures through becoming self-employed, setting up new businesses; or "Intrapreneurship"- developing and growing part of an existing venture (QAA, 2018). Intrapreneurs are described by Pinchot (1985) as the "dreamers who do"; those who take hands-on responsibility for creating innovation of any kind within an existing organization (Gündoğdu, 2012, p.299).

Various authors argue that through EE a variety of skill sets are built and enhanced. Studdard et al. (2013) discussed various entrepreneurship traits which include personality related ones such as risk taking (Bbenkele and Ndedi, 2010), adaptability (Timmons and Spinelli, 2009), creativity (Timmons and Spinelli, 2009), innovation (Pinchot, 1985), need for achievement and self-confidence (Ibrahim et al., 2004), perseverance (Markham et al., 2005); or functional competences such as management (Ibrahim et al., 2004), leadership (Vesper and McMullen 1988), and financial literacy (Timmons and Spinelli, 2009). A closer look at such skills finds that not only are they needed for entrepreneurship but also for employability of (young) people engaging in the new workforce

According to Mwasalwiba (2010) many scholars (Johnson, 2006; Matley, 2005a, b; Kuratko, 2005; Vesper and Gartner, 1997) share the opinion that entrepreneurship as a field of study has

made fast and remarkable progress and has achieved itself a place in the world of academics. Many stakeholders including policymakers, academician, and students, driven by individual as well as societal economic benefits have shown strong support to entrepreneurship education. Many of stakeholders had a common belief that entrepreneurship education would help to influence culture and build enterprising economies. The use of the demand and supply relationship may have sparked the interest of stakeholders as for example policy makers, on the demand side, are charged with the economic development responsibilities and have a belief that enterprise culture is a key to more new ventures and job creation. While on the demand side students are faced with changing job markets, which renders more graduates to either compete for few but challenging vacancies or opt for self-employment, on the supply side of academicians, plus their usual interest in academic advancement, are to provide entrepreneurship education as an interventional tool to building enterprising societies (to satisfy the policy makers), and further to have more innovative training programmes to satisfy the students. Therefore, it is these combined shared interests that have contributed to the exponential growth within this field of study, plus a now tentative agreement that entrepreneurship or some of its aspects can be taught.

1.1.6.2.Entrepreneurship Education: Key imperatives in developing entrepreneurship skills

The importance of transforming EE into a crosscutting subject that transcends business schools was largely discussed by Katz et al. (2014). His approach known as Cross Campus Entrepreneurship Education (CCEE) refers to a networked or collaborative effort within two or more disciplines in an educational organization to provide knowledge and develop skills in students specific to the pursuit of entrepreneurial endeavors, whether specific to their primary educational focus or in unrelated field (Roberts et al., 2014). This interdisciplinary approach is found related or compatible to many entrepreneurship definitions including entrepreneurship as the pursuit of opportunity, self-employment (Venkataraman, 1997), organizational emergence (Gartner & Katz, 1988).

Katz et Al. (2014, p.13) also argue that "Entrepreneurship education efforts grew from a concentration in a single educational locale, typically a department or center in a business school, to a multifaceted operation housed in several parts of the university. This effort named Cross Campus Entrepreneurship Education (CCEE) represented one of the most distinctive and far-reaching elements in academia's efforts to teach entrepreneurship". CCEE builds on three imperatives which are:

i. ***Entrepreneurial Occupation imperative***:

This imperative is related to "what to become" in the future. It is about thinking and reflecting students' need for training that is relevant to the occupations they plan to pursue after graduation. The rationale behind this imperative was motivated by the key challenge in teaching entrepreneurship at universities which is determining the place entrepreneurship fits. In thinking about "what to become" in the future, immediate reference goes to employment occupations and how individuals are trained to fit them. Many occupations are composed primarily of self-employed people, and other occupations can have large numbers of self-employed people, even where these large numbers represent a small fraction of the total employment in the occupation. So, if self-employment is the reality on the ground as pointed out in some empirical studies, entrepreneurship education will need to be taught in many places in a university (Katz et al., 2013; Roberts et al., 2014) There are self-employed individuals in various sectors (from manufacturing to creative industries) and levels of education attainment also vary from sector to sector (post-secondary to undergraduate degrees and beyond). The experience has shown that students will face self-employment at some point in their careers. Therefore, the potential for a multiplicity of somewhat parallel or redundant programs becomes one incentive for developing CCEE efforts.

ii. ***Entrepreneurial Employment imperative***

Government around the world realized the importance of entrepreneurship on the economy and how entrepreneurship education promotion can speed the high growth of new firms. David Birsch (1987) documented that government particularly in Europe supported and promoted high growth entrepreneurship efforts in universities as well as universities that promote a more positive attitude toward entrepreneurship. Starting with what was called the Lisbon Agenda 2000 (whose main objective was to make the European Union "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion" by 2010[3], such promotion was done in hopes of preparing a workforce better able to support, and eventually start, entrepreneurial firms (Katz et al., 2013). Later, it emerged that entrepreneurship education needed to be carried out at the campus beyond the

[3] https://www.consilium.europa.eu/uedocs/ cms_data/docs/pressdata/en/ec/00100-r1.en0.htm. Accessed on September 28, 2019.

business school (Aronson, 2004). Different supporting schemes were established some being discipline specific others being occupation specific.

iii. ***The Entrepreneurial University imperative***

This reflects active contribution of universities to the economic development of the region and nation through commercialization methodologies. Another distinctive element of entrepreneurial university involves the commercialization of the intellectual property created at the university. Licensing of inventions and other intellectual property developed at the university; faculty, students, staff or combinations of these to create new firms charged with taking the technology to market etc. are all means that contribute to achieving university entrepreneurship (Katz et al., 2014, Teece, 2000). Business directly or indirectly originating from university is created by faculty, students or staff. It can be created through discipline-specific way or in a way that promotes cross campus entrepreneurship education.

When looking back at the three imperatives, a closer relationship between entrepreneurship, entrepreneurship orientation and employability is drawn. It involves collaborative efforts from internal as well as external experts. Such collaboration makes it that entrepreneurs or prospective entrepreneurs receiving help from outside experts tend to do better in terms of survival rates and financial performance than people who go it alone without help. That said, academic skills supplemented with field experiences are likely to produce better results than skills from university alone. It is also argued that benefits increase from using any of a plethora of help sources including small business development centres, paid professionals (Chrisman et al., 2012), and education programs, including those in universities (EU, 2012b; Lange et al., 2011). It should be noted that a well-organized and executed EE program, in various disciplines at universities, will lead to successful CCEE.

The Consortium for Entrepreneurship Education (2013) asserted that EE has been found to improve student performance by demonstrating the relevance for learning and engaging them in the learning process. Bandura (1997) quoted by (IGI Global, 2017, p.250) discovered that "students perform better in school when engaged in interesting subjects or key subjects that lead to more ambitious careers and educational goals after school". From such studies, the motivational factor, delivery processes and expected outcomes are brought up. When choosing a study

program, students are driven by the exit profiles after completion of studies, high probability to obtain what they want in the program vis-à-vis what they aspire to become.

1.1.7. Entrepreneurial teaching

The Oxford Dictionary (2005) defines education as the theory and practice of teaching or information about training in a particular subject. Teaching and learning go hand in hand and combined they form the basis for education. While teaching is about transferring knowledge/skills and behaviours to the learner/student, learning is about learner/student receiving and applying them. There must be a gap for them to take effect. Teaching is not only about the content it is also about the methodology. From that angle teaching entrepreneurship means looking at the extent to which the education system is effective in providing instruction and experience in the creation, management as well as sustainability of Small, Micro and Medium Enterprises. According to Chimucheka (2014), the Consortium for Entrepreneurship Education (2004) looks at entrepreneurship education as a life-long learning process which proceeds through at least five distinct stages of development. The stages include the basics, competence awareness, creative applications, start up and finally, growth. In this process learners should acquire knowledge and understand concepts, apply them in the spirit of competence and material development.

Kelley et al. (2011) propounded that within any society it is important to support all people with 'entrepreneurial mindsets', not just the entrepreneurs, as they each have the potential to inspire others to start a business. Kelley argued that any educational training should enable people not just develop skills to start a business but rather to be capable of behaving entrepreneurially in whatever role they take in life. This understanding is quite broad, but it captures the critical philosophy of modern entrepreneurship education and training programmes required if countries are to generate an increasing pool of people who are willing to behave entrepreneurially (Cooney, 2012).

The literature about "entrepreneurship teaching" generally recognizes the importance of two aspects in its definition: first, a broader concept of education for entrepreneurial attitudes and skills, which involves developing certain personal qualities and it is not directly focused at the creation of new businesses and, second, a more specific concept of training on how to create a business (EU, 2004). Whereas the focus of entrepreneurship teaching in the past was on venture creation (with writing business plans being the model), modern scholars argue that the real challenge for entrepreneurship education lies within the development of entrepreneurial

behaviour, like seizing opportunities, making decisions and developing social skills; i.e. learning *for* entrepreneurship, rather than learning *about* entrepreneurship (Gibb, 2002). The choice of the training approach is dependent on whether the intention of both educators and learners is to create a business or to create awareness and knowledge about what to do and how to do it in business context.

There are many approaches for teaching entrepreneurship based on the transmission approaches of knowledge, skills and behaviours between teacher and students. Some approaches are teacher-centred (also known as instructive and the most dominant in Rwanda) while others are student-centred (also known as action or experiential learning and appearing in various trials). Amongst characteristics of the teacher centred approach (to mention a few), knowledge is transmitted from professor to students, students passively receive information, professor's role is to be primary information giver and primary evaluator, emphasis is on right answers etc. In the learner-centered approach students construct knowledge through gathering and synthesizing information and integrating it with the general skills of inquiry, communication, critical thinking, problem solving and so on, students are actively involved, professor's role is to coach and facilitate, professor and students evaluate learning together, emphasis is on generating better questions and learning from errors, etc. (Huba & Freed, 2000).

According to Gibb (2010), the manner in which entrepreneurship is taught needs to be significantly altered as the traditional model of entrepreneurship is no longer applicable to the modern business environment. Gibb portrayed the dominant model of entrepreneurship as being static and focused heavily on the writing of a Business Plan and the various functional activities of an enterprise. His alternative 'appropriate' model portrays the entrepreneur as dynamic with a range of behavioural attributes that need to be developed. Such a model embraces a number of key characteristics including: instilling empathy with entrepreneurial values and associated 'ways of thinking, doing, feeling, seeing, communicating, organising and learning things'; development of the capacity for strategic thinking and scenario planning and the practice of making intuitive decisions based upon judgement with limited information, etc.(Cooney, 2012). It emerged that this new orientation for entrepreneurship teaching focuses more on personality than functional aspects of entrepreneurship. It also appeals for developing the inner individual characteristics (also known as internal entrepreneurship- Komulainen et al., 2011) such as behaviours and attitudes rather than managerial competences (also known as external entrepreneurship- (Leffler,

2014) that are replicable through the same methods and processes. It is an action-oriented type of entrepreneurship education.

When it comes to teaching and learning entrepreneurship in Rwanda, one has to recall that it emerged as a tentative solution to skills gaps registered among graduates who were unable to fit in the market requirements. Following calls and recommendations from national as well as international organizations, teaching entrepreneurship skills at all levels of education was chosen as one of the strategies to lay the groundwork for developing a culture of entrepreneurship (UNCTAD, 2015). Entrepreneurship was introduced in curricular as a mandatory crosscutting subject. At some HEIs it is promoted through other additional means such as entrepreneurship/ innovation or incubation centres. Various activities like entrepreneurship weeks, study tours, entrepreneurship clubs… are organized to inspire students to think beyond their academic disciplines, a mindset that is meant to change their perception from being job seekers to job creators and/or self-employed.

As it can be assumed, discipline skills acquired at university qualify students to becoming technically employable after graduation, but the working environment and market competitions require students who developed extra-curricular skills including entrepreneurship. Such skills facilitate them to enter the market and to handle challenges of different nature (as employees or employers). In brief, as graduates are invited to become entrepreneurially minded and their entrepreneurial orientation needs to be high as well; graduates should be equipped with entrepreneurship skills, develop personal and technical qualities directly or indirectly focused at the creation of new (own) businesses (ie. Entrepreneurship) or working for others (ie. Intrapreneurship) (Stokes & Wilson, 2006).

1.2.Teaching entrepreneurship: problem description

There are few scientific publications on the status of entrepreneurship in Rwanda. There are even fewer publications or reports that discuss recent developments in teaching entrepreneurship at tertiary level. Entrepreneurship is discussed in different institutional strategic plans (Education Sector Strategic Plan 2013/14-2017/18, EDPRS-2, 2013/14-2018/19) and is considered critical to ensuring job creation and employment promotion. This philosophy is being promoted at secondary as well as tertiary education. At secondary and post-secondary level, it is perceived more in terms of “Productivity and Youth Employment” with hands-on skills than in terms of

enhancement of entrepreneurship personality/mindset. At tertiary level, each institution determines what it understands by entrepreneurship program. It must be accredited by the Higher Education Council.

On one side, while he acknowledges the importance of teaching entrepreneurship at school, Malunda (2014, p.28) criticises, on the other side, the existing teaching approaches and resulting outcomes because they are not effective for students to lead entrepreneurial life: "Entrepreneurship that is taught in schools is a driving factor towards self-employment because it imparts the students with practical skills which they can use to set up their businesses. However, it is important to note that the education curricular does not have entrepreneurship as a subject and the schools that have it only impart the theory and not the practicals. A number of students just do cram work in order to pass their exams and when they graduate they cannot be able to put the theory of what they studied into practice".

According to Honeyman (2016) and Malunda (2014), although the entrepreneurial education curriculum represents a major shift in pedagogy, moves to more interactive, student-centred learning, and is focused on providing students with skills to succeed in the job market; it lacks solid foundation in practice. This is due to schools lacking facilities, teachers trained in entrepreneurship, regulations prohibiting business activities within school premises (especially secondary schools), lack of capital, lack of access to information communication technologies (ICT), etc. In actual sense, there are a lot of incompatibilities between the intentions to promote entrepreneurship and practical realities on the ground. The entrepreneurship education policy represents an intriguing effort to influence the attitudes and aspirations of an entire generation in an entrepreneurial direction as few teachers or students are comfortable discussing the creative thinking and action required of entrepreneurs (Honeyman, 2016).

Due to lack of self-confidence about offering the material and holding students' interest in entrepreneurship, it has been difficult for teachers to achieve practical vision within the classroom. On top of that teachers lacked trainings to be able to employ teaching methods that develop entrepreneurial skills, analysis of complex business situations as well as creative problem-solving. As a result, the course is offered in a way similar to other academic subjects, with teachers mostly writing down, spelling the notes that students must copy down and memorize for their examinations, handing copies of syllabi and/or power point presentations. This approach may be

effective in helping students to learn new terminologies and drill certain basic skills but not developing independent thinking abilities that a practicing entrepreneur needs (Honeyman, 2016).

On whether entrepreneurship education is appropriately developed in tertiary education to prepare students for entrepreneurship as a career option, the situation is typically similar like in secondary and post-secondary contexts. Some institutions may claim to follow action-oriented entrepreneurship (learning-by-doing) but none of them does it in real sense. The business plan is the reference when talking about entrepreneurship subject but the way it is taught is by far theory than practice. Course syllabi or handouts are handed to students, key entrepreneurial terminologies are explained through lecturing, but practical learning is quasi inexistent. Not only institutions lack facilities and expertise for supporting practical entrepreneurship, but also the time allocated to the module (35 to 60 hours face-to-face in most cases) and the high ratio teacher - students makes it difficult for teachers to adopt practical learning.

Though the situation is slowly changing following government recommendation, Niyonkuru, (2005) found that no higher education institution in Rwanda provided a degree or diploma in entrepreneurship. Many entrepreneurship subjects were provided as standalone courses by most of HEIs and mostly in management or business departments. Entrepreneurship support activities and mechanisms were hardly available in the institutions as only one institution had an entrepreneurship club or association. This was the only support mechanism existing at HEIs. Others such as business plan competitions, entrepreneurship web pages and entrepreneurship centres as mechanisms to raise entrepreneurship awareness among undergraduates were not available. This goes alongside the lack of or insufficient infrastructure and resources oriented towards raising awareness about entrepreneurship.

Although it is well known that writing a business plan is one way among others used to learn about or for entrepreneurship and that competition is critical for raising students' awareness and interest, it is unfortunate that there are no strong support mechanisms (such as financial assistance, equipment) availed by host institutions to facilitate the creation of students' enterprises at their premises or nearby. One can expect a birth of new firms by academic community members only where there is a relational context that gives to the new entrepreneurs some assistance, consultancy, contacts, information and the necessary financial support to start a new business (Consiglio and Antonelli, 2001; Niyonkuru, 2005). Under such circumstances entrepreneurial

learning becomes effective and can really boost students' interest into the world of entrepreneurship. Even if there are insufficient means to support the learning-by-doing process, the willingness of decision-makers to put in place different learning mechanisms is a good thing but it requires strong monitoring and evaluation strategies.

Despite the willingness and commitment to teach entrepreneurship, there are debates about the significant impact of entrepreneurial education on an individual's life other than its use solely in an entrepreneurial career/environment. Questions are on whether thinking and acting like an entrepreneur may impact one's broader work performance and life perspective (Studdard et al., 2013). This debate could be especially relevant in view of the changing nature and scope of work from an industrial based economy to an economy driven by technology, contingent labour, information, and knowledge (DOL, 1999) whereby students are appealed to demonstrate strong entrepreneurial mindsets and attitudes. Although individuals may rejoice over the perceived impact of entrepreneurship education in general, a major challenge now is that there are different definitions of entrepreneurship; which imply different target audiences, different teaching methods and different results with regards to students' entrepreneurial orientation. These reflect and contribute to the difficulties of measuring entrepreneurship education and implications of various training approaches.

In the entrepreneurship literature, studies established fundamental differences between traditional business education and entrepreneurship education (Solomon et al., 2002). Traditional business education is concerned with the provision of skills needed to understand the function of an already existing business (an instructive approach mostly covering business planning skills) while the main objective of entrepreneurial education is "to generate more quickly a greater variety of different ideas for how to exploit a business opportunity, and the ability to project a more extensive sequence of action for entering business" (mostly covered in various models of action or experiential learning). Given the surge in entrepreneurship education studies, there is a growing number of universities and colleges offering entrepreneurship, but the dilemma is not that demand is high, but that the methods of teaching selected meet the new innovative and creative mindsets of students. In the same line, the challenge for educators is to develop creative curricula that meet the rigors of academia whilst keeping a reality-based focus and entrepreneurial climate in the learning experience environment (Solomon et al., 2002). Additionally, students lack opportunity

to engage with enterprise and entrepreneurship, and to align it with their subject(s) of choice (QAA, 2018).

In this teaching/learning relationship, teachers and students interact in different ways and occupy different roles in developing and transferring entrepreneurship knowledge and skills. Based on teacher-students position in the knowledge/skills transmission process, the teaching can be teacher-centered (instructive, theoretical or students passive learning) or student-centered (experiential or students active learning). This classification comes with transmission techniques which can range from mass to individual transmission. Up today there is no conclusion on which one is the best teaching style because results differ depending on many factors including but not limited to the learning objectives and motivations, didactics, ecosystem, expertise of the educators, etc. However, contemporary trends of education converge on the fact that classical teaching style (most applied) is facing competition from action-oriented or experiential learning styles in higher education (Ahmed & Ain, 2013; McCombs and Whisler, 1997; Weimer, 2002).

Entrepreneurship teaching in Rwanda has been dominated by teaching the business plan in a traditional way which should be replaced by creative and experiential models. Students taking entrepreneurship courses at HEIs in Rwanda are only sensitized to the possibility of starting their own enterprises but are not given the opportunity to practically experience entrepreneurship (Niyonkuru, 2005). As the focus on how to start a business and the business planning can only profit those who are developing functional aspects, those looking for developing entrepreneurial minded thinking that can be used for the organizational benefit do not profit much. Therefore, there is not only an entrepreneurship curriculum deficit whereby the content is too basic and more theoretical but also a deficit of teachers trained in entrepreneurship. Combined, there is a deficit of more practical entrepreneurial concepts as well as tools that stimulate proactive, interactive and creative entrepreneurial-like thinking. Per such critics, there is a need to review how entrepreneurship teaching is done and to adapt it to the present market trends by introducing new teaching approaches that develop active learning and dynamism in entrepreneurial thinking.

1.3.Objectives of the study

This study has the main objective and specific objectives.

1.3.1. Main objective

The main objective of this study is to develop and test an entrepreneurship training module that helps entrepreneurship training institutions to enhance students' entrepreneurial orientation. It is in line with progressive development and adaptation of teaching methodologies that facilitate to assess the effect of entrepreneurship education on students' entrepreneurial-like thinking. Rae (2005) argues that exposure to entrepreneurship education delivers orientations to the cognitive features and skills necessary for initiating and managing entrepreneurial ventures (as employee or employer). This entrepreneurial competence development fits also within the progressive introduction of ways of increasing graduates' employability so that graduates can better adapt to the constant transformation of uncertain professional environments and also to raise the levels of worker qualification and expertise called for by the labour market (Corominas, 2010).

1.3.2. Specific objectives

There are three specific objectives for this study.

First, identifying approaches used for developing entrepreneurship education: It has been argued that entrepreneurial teaching/learning is perceived as a complex dynamic phenomenon. It is regarded as an experiential process in which entrepreneurs develop knowledge through distinctive learning abilities involving experiencing, reflecting, thinking, and acting (Johannisson et al., 1999). It is therefore vital to broadly understand concepts of entrepreneurship education and link them with key entrepreneurial competences, behaviours and attitudes.

Second, developing and testing a new entrepreneurship model: This is in line with the search for alternative approaches to business planning which, according to debates and research developments, lacks dynamism that characterizes contemporary market environment. Both the business plan centered module and the new model were delivered to students to check the effects of each on students' entrepreneurial orientation.

Third, assessing the effect of the taught entrepreneurship models on students' entrepreneurial orientation. The professional involvement of students in the enterprise life is a vector of encouragement to entrepreneurship (Ayegou et al., 2014). Graduate success in entrepreneurship or intrapreneurship rests on the implementation of various crucial and strategic actions. Adaptation of the teaching-learning approaches is one of them and should look at what degree the

action-oriented entrepreneurship module induces and enhances learners' entrepreneurial skills and their empathy with the entrepreneurial life world. Therefore, it is in the interest of different stakeholders to get updated on the developments of entrepreneurship education in Rwanda. Recommendations to policy makers in the field of education are issued for appropriate and consecutive use.

1.4.Contribution and limitations of the study

This study intervenes mainly for looking at whether mixing standardized entrepreneurial learning components affect the students' abilities to think entrepreneurially; such entrepreneurially thinking and acting abilities may top-up their subject-focused skills which may put them in better employable conditions. The teaching happened in a place and environment whereby entrepreneurship mindset is not highly developed both for students and local people, it applied to a target group of students who have little or vague knowledge about entrepreneurship.

The study considered the limitations of Rwanda's existing entrepreneurship education ecosystem in order to develop and introduce new combinations of innovative learning strategies that can help students acquire entrepreneurial skills and competences in a short time. The teaching approaches used contribute to the understanding of entrepreneurial characteristics and competences that can be applied individually or within an existing organization. But most importantly, the new training model combines elements and tools used in business skills and value chain analysis and rests mainly on participatory learning and action learning approaches. As values of practical and emergent learning challenge the traditional culture of academe that privileges programmed knowledge, this study contributes to the theory of entrepreneurship and to the pedagogy for entrepreneurship. Apart from explaining the meaning and significance of entrepreneurship education and entrepreneurial orientation, it describes the teaching/learning approaches that can facilitate and speed up the development as well as the transfer of entrepreneurial and employability skills/thinking to an audience with no or less exposure to entrepreneurial activities.

However, given the sample size of respondents from three departments belonging all to one higher learning institution, results could not be generalised across HEIs in Rwanda. Two reasons are behind this statement: 1) the instrument is in the experimental phase and was applied to students in science majors only; 2) the learning and lifestyle environments at INES Ruhengeri in particular and Rwanda in general are characterised by low entrepreneurial mindset and high threats of

unemployment. These may act as motivational or push factors to entrepreneurial learning and may have a certain influence on the learning outcomes. Therefore, although the test results were promising, further experiments of the model need to be conducted in institutions and places where entrepreneurship culture is a bit advanced. It can also be tested in highly competitive and risky market sectors and get compared to less competitive and less risky ones. Furthermore, it can be experimented on students in business management disciplines.

2. CHAPTER TWO: LITERATURE REVIEW

There are various and important links between entrepreneurship and education. Graduates with entrepreneurial skills are likely to produce better and immediate results after joining the employment environment. In the definition of entrepreneurship, it is stressed that the concept embraces a much broader perspective which spans from learning how to start a business to a person's way of thinking (EU, 2004). Entrepreneurship education accommodates and fosters entrepreneurial learning and helps individual students to develop a set of skills and competencies that can facilitate and support their entrepreneurial activities. The design of entrepreneurship programs relies on objectives to be attained by the educators or target audiences. The delivery approaches consider enhancing theoretical knowledge as well as practical skills (entrepreneurial thinking and/or acting). However, the emphasis may vary according to teaching conditions (staff, curricula, didactics etc.) as well as intended purposes of learning.

In this chapter, key concepts are defined, discussed and interpreted in the context of entrepreneurship education. They include entrepreneur, entrepreneurship and intrapreneurship, entrepreneurial orientation and entrepreneurship education. Underlying theories behind this work are also discussed and they include "Action learning theory and Expectancy theory". The term "entrepreneurial" is used as a 'catch all' term that envelops both enterprise and entrepreneurship and may be used when discussing the combination of both.

2.1. Description of key entrepreneurship concepts

2.1.1. The entrepreneur and the enterprise

For defining entrepreneurship, it is good to understand its origin and evolution. The word "entrepreneurship" finds its essence in activities performed by an "entrepreneur". The word entrepreneur derives from the French which literally means someone who takes between or goes between. The term "entrepreneur" can be traced from Richard Cantillon (1734). According to Hoppe (2016), an entrepreneur is today viewed from different perspectives but the most dominant are those championed by Joseph Schumpeter in "The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle (1934)". First, he/she is viewed as the coordinator of other production resources- land, labour and capital; second, as the decision-maker under uncertainty; third, as the innovator, and finally, as the gap filler and input completer. Schumpeter sees in the entrepreneur someone who introduced new products, processes and organizational forms, thus being the initiator of innovation. Richard Cantillon (1734) introduced

the word entrepreneur into economic literature and described three types of agents in the economy: the landowner- who as the proprietor of land provided the primary source; entrepreneurs- including farmers and merchants who organized resources and accepted risk by buying at a certain price and selling at uncertain price; and hirelings (somebody who works only for money, especially at menial/basic or unpleasant tasks) who rented out their services (Stokes & Wilson, 2006).

John Baptist Say (1800s) defined an entrepreneur as someone who consciously moves economic resources from an area of lower, and into an area of higher, productivity and greater yield. In other words, he takes other resources- people, materials, buildings and money- and redeploys them in such a way as to make more productive and give them greater value. Referring to the concept of creative destruction, Schumpeter (1934) suggested that the dynamic economy takes as its norm the disequilibrium brought about by the constant change of innovation and entrepreneurship. He defines an entrepreneur as an innovator who creates new industries and thereby precipitate major structural changes in the economy. Schumpeter's view was not considering a small level which later on was developed and explained by Alfred von Hayek (1937) and Israel Kirzner (1973) as middlemen who provide price quotations as an invitation to trade. The aim of an entrepreneur is making profit where they buy cheap and sell dear (Casson et al., 2008). According to Peter Drucker (1985), an entrepreneur is someone who always searches of change, responds to it, and exploits it as an opportunity. He, like Schumpeter, made innovation a necessary part of entrepreneurship, but he focused more on the management processes involved in what entrepreneur does. In performing their role, entrepreneurs carry out a range of different tasks: they collect information, make judgments calls, raise finance, and develop business organizations. Such a business organization is referred to as enterprise.

Enterprise may refer to organized business activities aimed specifically at growing and profit; it may also refer to readiness to put effort into new, often risky, ventures or activities (Encarta Dictionary). By looking at enterprise in the context of education, QAA (2018) defines enterprise as the generation and application of ideas, which are set within practical situations during a project or undertaking. This is a generic concept that can be applied across all areas of education and professional life. It combines creativity, originality, initiative, idea generation, design thinking, adaptability and reflexivity with problem identification, problem solving, innovation, expression, communication and practical action.

- **Characteristics of entrepreneurs**

Like Peter Drucker (1985), Kuratko (2005) sees an entrepreneur in the role of agent of change. The traits of the entrepreneur are deemed to be exceptions to what normally depicts man, especially the propensity of taking risks and acting to change the present situation. He condensed personal traits into the idea of an entrepreneurial spirit that he describes with the following characteristics: seeking opportunities, taking risks beyond security, and having the tenacity to push an idea through to reality. Entrepreneur characteristics also referred to as personal entrepreneurship characteristics are summarised as follows:

Table 1: Key entrepreneur characteristics

Characteristics	Traits
Self- confidence	confidence, independence, individuality, optimism
Task-result oriented, persistence, determination	need for achievement, profit oriented, perseverance, hard work, drive, energy, initiative
Risk-taking	risk-taking ability, likes challenges
Leadership	leadership behaviour, gets along well
Originality	innovative, creative, flexible (openness of mind) resourceful versatile, knowledgeable
Future-oriented	foresight, perceptive

Source: Anietie, 2014

2.1.2. Entrepreneurship and Intrapreneurship

2.1.2.1.Entrepreneurship

It is a fact that definitions of the concept of entrepreneurship change depending on the use and context, just as Gibb (2002) argued they should. Following are some examples of the diverse definitions found within the entrepreneurship literature.

Traditional definitions of entrepreneurship have laid emphasis on the process, action-oriented management style which take innovation and change as the focus of thinking and behaviour. Low and MacMillan (1988) define entrepreneurship as the process of starting small businesses and growing them into large and successful businesses. This process involves four pillars: planning, organizing, operating and assuming the risk of a business venture (Trott, 2008). Scott Shane (2003) defines entrepreneurship as an activity that involves the discovery, evaluation and

exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and raw material through organizing efforts that previously had not existed. According to Shane and Venkataraman (2000) opportunity is "key" to any attempt of defining entrepreneurship. They define entrepreneurship as "a process through which opportunities to create future goods and services are discovered, evaluated and exploited". They argue that the field of entrepreneurship involves the study of sources of opportunities; the process of discovery, evaluation, and exploitation of opportunities. In this context, the entrepreneur is defined as the individual who discovers, evaluates, and exploits opportunities. By connecting entrepreneurship to economics and business administration, the above definition and similar ones have given it a home indirectly (Carlsson et al., 2013). It becomes almost impossible to dissociate entrepreneurship from economics and business administration.

Davidson (2003) takes entrepreneurship to a wider aspect of society and defines it as societal phenomenon or process of change, comprising the following 3 elements: the identification, evaluation and exploitation of an opportunity; the management of a new or transformed organization so as to facilitate the production and consumption of new goods and services and; the creation of value through the successful exploitation of a new idea (i.e. innovation). In his article, Hoppe (2016) concurred with Landström (2005) that studying entrepreneurship is still closely related to start-ups and the continuous struggle for businesses to recreate themselves and stay viable. Hope asserted that concepts of entrepreneurship, innovation and creativity are in frequent use in popular media, often intertwined with political as well as business rhetoric (Commission & Sciences, 2010).

Entrepreneurship is now gaining attention from a growing number of academic fields where the concept is being adapted and adopted to a variety of research interests (Landström, 2005). However, it's often difficult to demarcate entrepreneurship because attentiveness to opportunities remains a vital ingredient in contemporary entrepreneurial theories (Carlsson et al., 2013; Kirzner, 2009; Shane and Venkataraman, 2000). Opportunities (and needs) exist on all levels of analysis from personal to societal and can be described in reference to all sorts of actors (Mars and Rios-Aguilar, 2010; Shane and Venkataraman, 2000).

As interests in new entrepreneurship fields continue to emerge against traditional entrepreneurship and the alleged economic growth it promises, new and alternative interpretations are continuously

created in order to disunite entrepreneurship from business (Gibb, 2002). For example, in the Entrepreneurship Competence Framework, entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social (Bacigalupo et al., 2016; McCallum E. et al., 2018).

According to Berglund and Holmgren (2013, p.18), "Entrepreneurship is a dynamic and social process, where individuals, alone or in co-operation, identify opportunities and do something with them to reshape ideas to practical or aimed activities in social, cultural, or economical contexts." Though too loose to provide a specific orientation, the above definitions allow every other individual definition to fit in. Today, people can venture into social entrepreneurship, cultural entrepreneurship, religious entrepreneurship, economic entrepreneurship etc. with the profit being or not pecuniary.

2.1.2.2.Intrapreneurship

In his definition of entrepreneurship Davidson (2003) pointed out that it is about identification, evaluation and exploitation of an opportunity; the management of a new or transformed organization so as to facilitate the production and consumption of new goods and services; the creation of value through the successful exploitation of a new idea (i.e. innovation). In this definition, the second point is crucial for individual workers operating within an organization and wish to utilise their entrepreneurial competences in order to transform or create value for the organization. Using personal entrepreneurial competences for the benefit of others within the organization instead of creating own business leads to intrapreneurship.

For Collins and Moore (1970), intrapreneurship also called "corporate or administrative entrepreneurship" is the process by which an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization.

Antoncic & Hisrich (2001) define intrapreneurship (also called Entrepreneurship within existing organizations) as a process that goes on inside an existing firm, regardless of its size, and leads not only to new business ventures but also to other innovative activities and orientations such as development of new products, services, technologies, administrative techniques, strategies, and competitive postures. Intrapreneurial organizations are those that engage in new business venturing, are innovative, continuously renew themselves, and are proactive. For Pinchot (1985),

intrapreneurs are the “dreamers who do”; those who take hands-on responsibility for creating innovation of any kind within an existing organization.

From these definitions, the only difference between entrepreneurship and intrapreneurship lies in the status of checks and balances in the decision-making process. In entrepreneurship individuals decide, act and bear the risks on their shoulders; in intrapreneurship individuals depend or rely on others’ approval before acting; and risks are shared within and by the organization. Individuals in both cases use same entrepreneurial characteristics and competences.

2.1.2.3.Key requirements for successful entrepreneurship and intrapreneurship

For successful entrepreneurship, Shane (2003) and O’Hara (2011) highlight five key elements:

- First, t*he ability to identify and exploit a business opportunity*: this condition presupposes the existence of opportunities or situations in which people believe that they can use new means-end frameworks to recombine resources that generate profit;
- Second, *the human creative effort of developing a business or building something of value*: this refers to forms of innovation not necessarily innovation resulting in new combinations that spur creative destruction;
- Third, *the willingness to undertake risk*: this underscores the preparedness against challenges that an entrepreneur is likely to encounter in the entrepreneurship journey. Individuals engaged in the entrepreneurial process cannot know with certainty, at the time of making decision, if their plan for recombining resources will result into profit or loss; something that forces an entrepreneur to bear the risk during the execution process;
- Fourth, *competence to organise the necessary resources to respond to the opportunity*: an entrepreneur exploits an opportunity through (re)combination of resources. Before they sell at a profit, they need organizational mechanisms that respond to that purpose. They should make the organization work in a way that did not exist before and continuously improve their competitive advantage. Such competences revolve around creative problem, opportunity or problem identification/solving, negotiation, influencing, leadership, business and finance awareness, etc.
- Fifth, *differences between people*: In the absence of variation among the people everyone would recognize and act upon all opportunities. That would render making profit

impossible because it would be difficult for a person to gain access to resources at a price for which recombination could yield profit.

For successful intrapreneurship, Antoncic and Hisrich (2001) insist on values and organizational behaviours. In terms of values, organizations need open and quality communication, existence of formal controls, intensive environmental scanning, and management support. In terms of organizational behaviours, they need engagement in new business venturing, innovativeness, continuously renew themselves, proactiveness and organizational support.

2.1.3. Entrepreneurial orientation

The concept of entrepreneurial orientation is very much associated with strategic decision-making that companies are inclined to take for overcoming uncertainties in the business environment and for effective performance. It was extensively discussed in the works of Lumpkin and Dess (1996), Rauch et al. (2009) and Rosenbusch et al. (2013). Entrepreneurial orientation refers to processes, practices, and decision-making activities that lead to new entry, and involves the intentions and actions of key players functioning in a dynamic generative process aimed at new-venture creation (Lumpkin and Dess, 1996; Koe, 2013). According to Hu et al. (2018, p.3), several authors including Thompson, (2009), Obschonka et al. (2017), Markman et al. (2002), Ajzen (1991) defined entrepreneurial intention as "a self- acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future. It constitutes a more or less concrete plan to prepare for, and then ultimately start, an entrepreneurial career of one's own in the future. Entrepreneurial intention plays a crucial role in shaping an individual's entrepreneurial behaviours, the stronger a person's intention to engage in a specific behaviour, the more likely it is that the actual behaviour will be performed".

Lumpking and Dess (1996) stated that firms with high entrepreneurial orientation outperform other firms because such dimensions help firms to seek and exploit new opportunities for growth. Campos et al. (2013) linked EO to the recognition, evaluation and exploitation of business opportunities. Based on the way companies run businesses, Stevenson and Jarillo (1990) argued that companies have entrepreneurial behaviour if their actions and processes are oriented towards the recognition and exploitation of entrepreneurial opportunities. EO dimensions include autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness.

For intrapreneurship orientation the same description of behaviours by individuals/units within an existing organization applies. However, they are subject to certain internal influences and control in terms of decision-making and collaboration.

While entrepreneurial orientation has five dimensions (some studies limit them to three), intrapreneurship orientation has four dimensions. Such dimensions are put together and described in the following Table 2.

Table 2: Entrepreneurship and Intrapreneurship orientation indicators

Entrepreneurship Orientation (Lumpkin and Dess, 1996; Antoncic and Hisrich, 2001; Rauch et al., 2009; Vishal Gupta and Alka Gupta, 2015)	
Dimension	**Indicators**
1. Autonomy	• self-determination of own idea-and make a business out of it • willingness to leave secure positions in order to promote novel ideas or venture into new markets • feeling free • ability and will to be self-directed in the pursuit of opportunities • feeling independent
2. Innovativeness	• tendency to engage in and support new ideas • like novelty • experimentation and creative processes that may result in new products, services, or technological processes
3. Risk taking	• borrowing • investing in unexplored markets/technologies • choose between a safe alternative and a more attractive but risky one
4. Proactiveness	• taking initiative by anticipating and pursuing new opportunities • taking initiative by participating in emerging markets • Forward-looking perspective accompanied by innovative or new-venturing activity • idea of being first to market or first to imitate
5. Competitive aggressiveness	• propensity to directly and intensely challenge competitors • always want to improve position • always want to outperform rivals
Intrapreneurship Orientation (Antoncic and Hisrich, 2001)	
1. New business venturing	• redefining the company's products/ services • developing new markets • formation of more formally autonomous or semi-autonomous units or firms • internal venturing; corporate start-ups • autonomous business unit creation; • creation of new streams
2. Innovativeness	• new product development • product improvements • new production methods and procedures

3. Self-renewal	• Redefinition of the business concept • reorganization • introduction of system-wide changes or innovation • new strategic direction • adaptability and flexibility
4. Proactiveness	• inclined to take risks by conducting experiments • take initiative • bold and aggressive in pursuing opportunities
EO dimensions of Competitive aggressiveness and risk taking are embedded in Proactiveness	

Source: Author's elaboration, 2019

With a slight shift from the field of business to the field of education, entrepreneurial orientation for students will have to consider certain aspects related to educational performance attitudes. The attention of educators for developing students' entrepreneurship and entrepreneurial competencies is very important. Teachers are required to have a good understanding of the entrepreneurial orientation of students as to whether they actually have the inner drive to become entrepreneurs as well as the competencies that favour a successful entrepreneurial career (Taatila & Down, 2012).

In such a context, it is recommended to check whether or not students have some background in business (have relatives or colleagues who are entrepreneurs, have been exposed to business concepts through trainings, visits, internships or industrial attachments before, have their own business or worked for somebody else as business agents etc.). This check-up helps to get an idea about different levels of students' entrepreneurial understanding and, to some extent, a precursor to students' behaviour during course delivery. By so doing, it is possible to check if there are differences in the EO for students in different academic programs, or if there are differences based on students' desire to take on the entrepreneurial path, or if there are differences in their capabilities (Taatila and Down, 2012). Having done that, the teacher knows the strengths and weaknesses of the students and prepares the training accordingly. It is recommended to keep an open eye on the progress of intentions and attitudes of the students during the teaching period.

For a quick view, dimensions of entrepreneurial orientation (if scaled down from enterprise to individual level), act as a combination of many behaviours, values and attitudes affiliated with entrepreneurship (Rauch et al., 2009). Proactiveness refers to opportunity seeking, an ability to notice a potential opportunity in normal everyday situations; autonomy encompasses an individual's need for independence and freedom; risk-taking reflects quick decision-making in uncertain situations and taking bold actions by venturing into the unknown environment and taking responsibility for that; Innovativeness refers to coming up with new, creative ideas and

solutions to the problems and decisions; competitive aggressiveness refers to the intensity of an individual's effort to outperform rivals (Rauch et al., 2009). These dimensions are detailed below.

2.1.3.1.Pro-activeness

The EO dimension of proactiveness, according to Zhao & Smallbone (2019), refers to the propensity to act on the part of human beings. As an EO dimension, it can be argued that proactive behaviour is one of the most important characteristics of entrepreneurship. Under proactiveness, there are at least three components that interact each other: human agents, the environment and behaviour. Looking at this interaction and its impact on changing social and economic environment, Zhao & Smallbone (2019, p.318) consider the importance of Bateman and Crant's (1993) element of "proactive personality. This is defined as "a dispositional construct that identifies differences among people in the extent to which they take action to influence their environment". Such a conscious or unconscious propensity happens when facing and dealing with internal or external constraints. Individuals with proactive behaviours are mostly action-oriented entrepreneurs who are attracted by business opportunities. Once they have discovered them, they try the best in their capacity to overcome any challenges that may obstruct the exploitation of such opportunities. However, not always proactiveness results into (immediate) opportunity exploitation. It may lead only to understanding the situation, the environment or phenomena surrounding a particular issue. This is because processing the obtained information into product/solution depends on many factors including time (whether it is the best time to act or react), resources (whether resources are available or enough), benefits (measuring benefits between acting and not acting) etc.

In this mental exercise, intentions and actions as main drivers of entrepreneurial orientation need to be well understood especially when considering EO at individual or organizational level. At an individual level, proactive people are not passive recipients of external environmental pressures, but are rather co-creators of the environment in which they operate. In circumstances of uncertainties brought by external environment, they strive to find out how to control these environmental pressures, rather than attempting to predict future environmental changes; they are also considered as people who see contingency as an opportunity and seek to take advantage of it rather than to evade it. On the other side, organizational proactiveness is characterised by active scan of external environment to discover new market opportunities; encouraging innovation and

change within the organization; forecasting institutional change and social trends, and redesigning or changing business processes or products in order to resist adverse changes in the environment (Zhao & Smallbone, 2019).

Apart from the tendency to change the environment, Hu et al. (2018, p.3) assert that empirical studies have confirmed that there is a positive relationship between proactive personality and entrepreneurship, that proactive individuals are more likely to achieve success at work and more positively attuned to the need for dominance, achievement, self-confidence, and conscientiousness. On top of that, proactive individuals have the ability to recognize signs of alertness thereby giving them the privilege to recognize entrepreneurial opportunities and act upon accordingly. When explaining entrepreneurial alertness and its connection to proactiveness and opportunity recognition, Hu et al. (2018) assert that alertness is a motivated propensity of man to formulate an image of the future whereby individual is able to identify new solutions to market and customer needs in existing information, and to imagine new products and services that do not currently exist.

Whether it is applied to individuals or organizations, proactiveness requires desire and willingness to think and initiate actions to answer future situations and threats. Such desire and willingness are prerequisites for other behavioural manifestations such as risk taking and innovation. In the context of university students, it is crucial to train students in matters related to environmental scanning, forward-looking and decision-making to not only improve scanning skills but also develop leadership skills too. Proactive people deal with individuals and teams thereby needing interpersonal skills such as leadership and communication skills. That is why students have to, on top of interpersonal skills, understand the importance of establishing and building relationships, teamwork in shaping their proactive personality. Furthermore, with the latter, individuals are well positioned to exert influence on the team for achieving entrepreneurial milestones. In brief, learning and developing proactive behaviours mean building capacities of persons who are capable to search for future prospects, exhibit ingenuity, take action, feel confident, and persist until they create change (Naz et al., 2020). It also means that being proactive is essential to entrepreneurial success because it suggests a forward-looking perspective that is accompanied by innovative activity (Okhomina, 2010).

2.1.3.2.Innovativeness

The concept of innovation has been extensively researched. The literature links innovation to economic activity and has emphasized its importance for making decisions regarding investment projects or investments for production. It is asserted that innovation can bring benefits such as saving time, costs, and products and use them more effectively. As it has always been in the contemporary world, innovation is one of the most important factors of economic development, production, creation of a variety of products and in making management decisions. It also stimulates and has a positive effect in investment activity (Kogabayev & Maziliauskas, 2017). At the heart of innovation, generating new ideas and processing them into new products, services or processes are key considerations. Such considerations lead to the dynamic growth of the national economy and the increase of employment; they also contribute to the creation of pure profit for the innovative business enterprise. Although many definitions link innovation to economic performances with the general belief based on subjects and exact sciences and technology, innovation goes beyond to incorporate several examples of social innovations leading to significant changes in society.

As a process, innovation is never a one-time phenomenon, but rather a long and cumulative process of a great number of organizational decision-making processes, ranging from the phase of generation of a new idea to its implementation phase (as mentioned earlier). Moreover, new idea means the perception of a new customer need or a new way to produce which is or can be generated in the cumulative process of information-gathering coupled with an ever-challenging entrepreneurial vision (Kogabayev & Maziliauskas, 2017). Innovation involves forward looking mindset and practice which, in the field of market competition, allows the enterprise to lead the market. Being innovative requires creativity skills. Both creativity and innovation are essential for individuals or organizations venturing in business or wishing to efficiently perform ahead of competitors. Both can promote human potential by eliciting positive aspects of the individual in different contexts. Based on Nakano & Wechsler's (2018, p.238) definition “creativity can be understood as being a multidimensional construct, involving cognitive variables, personality characteristics, family, educational aspects, and both social and cultural elements…..Personality variables associated with creativity are an amalgam of positive characteristics, such as curiosity, tolerance towards different ideas, autonomy, imagination, self-confidence, persistence, motivation, and others”. Creativity can also be understood as a process that a person undertakes

to reach self-actualization and to develop characteristics that are related to mental health. The latter includes subjective well-being, resilience, optimism, quality of life, and other aspects emphasized by positive psychology. For effective development of creativity/innovation mindset or behaviour, such personality characteristics should highly be emphasised by the trainers.

Creativity is also associated with motivation and knowledge background in or about something. This makes Amabile (1996), cited by Nakano & Wechsler (2018), to consider creativity as an interface of motivation with a specific area of knowledge. Both authors agree that creative people would function on behalf of their intrinsic motivation, considering this as a key component to influence an individual's ability to express his/her talents. From this perspective, it gives a room for questioning how students' innovation or creativity can be effectively enhanced within universities (bearing in mind that in many occasions, as opposed to business organizations, they do not have sufficient resources and freedom to process their ideas).

When institutions have to develop innovation behaviours and skills, especially for students and fresh employees, there are certain qualities that should attract their attention. These can be classified into various sets such as technological competencies (the level of engagement with advanced technologies); information skills (the ability to conceive and use information from different sources, including mass media and the Internet, and to use information technologies for communication and information search). They also include management skills (project-management skills, managerial and organizational knowledge); marketing skills; entrepreneurial skills (the ability to start a new business, manage it, and assume responsibility and risk); communication skills; and personal qualities (creativity, proactive attitude, leadership, self-efficacy, tolerance, risk-propensity) (Gokhberg & Poliakova, 2014).

When one checks the above sets, they are sets of functional as well as personality skills and competences that can apply to macro or micro levels (organizational versus individual levels). They uncover the importance of mastering generic, sector-specific or technical skills as well as the ability to successfully connect various factors in the environment the can apply to. They appeal for practice-oriented learning whereby students get the opportunity to dream, explore and try out their dreams in the purpose of creating or adding value to something useful to the society. In brief, training students in techniques of idea generation and development as well as accompanying them in processes of implementation increases their ability in the innovation dimension. Although this

implementation phase cannot be feasible to every idea, there should be mechanisms that allow learners to experience the process before they step into job positions.

2.1.3.3.Risk-taking

When defining risk-taking, considerations are put on conscious or non-conscious controlled behaviour with a perceived uncertainty about its outcome, and/or about its possible benefits or costs for the physical, economic or psycho-social well-being of oneself or others. Risk-taking opportunities defined in a social environment refer to social contexts that facilitate, encourage, or permit behaviours that might entail some probability for negative consequences (Boyer & Byrnes, 2016). In the business context, risk is related to the willingness of entrepreneurs to commit to manage all the resources they have to finance a business fully in spite of the high probability that the business may fail. Since individuals including entrepreneurs don't like failure, they try their best to avoid being fail. For that, entrepreneurs are willing to take the risk with the hope that they will reign over the difficulties and finally make profits. Business risk-takers do not do it haphazardly. They do it when the propensity to get profit is higher than the loss incurred by the risks. This justifies why the concept of risk rests on the principle that loss factor must exist (Hongdiyanto, 2018) although that risk must be calculated.

For an entrepreneur, as highlighted by Hongdiyanto (2018, p.131), there is likelihood that s/he "will face several types of risks that are grouped into four parts: *a) Financial risk:* This risk is a risk that must be faced by every entrepreneur. Capital is definitely needed in starting a business, be it in small or large scale. The capital may come from personal funds, or from other parties. If the business failed then the capital can be lost. *b) Career risk:* This risk is faced by entrepreneurs who had previous permanent jobs. If being an entrepreneur means he must leave his old job that provided fixed income for a new business that is not yet certain. *c) Family and social risk*: This risk relates to the time consumed in starting a new business, reducing the time usually spent with family or friends. *d) Psychic risk:* This risk is to be avoided by an entrepreneur. Psychic problems can occur if the business owner has a very severe problem that gets to the point of depression".

When individuals (students in this case) are able to identify and understand risks associated to the type of market they are likely to enter after graduation, it increases their reflection on how best they can survive in the future. That is the reason why when teaching students, there should be an extensive demonstration of the interconnectedness between various types of risks. This is because

business and employment take place in the society and each feeds the other in many ways. Needs/ opportunities originate from the society and solutions/consumers also originate from the society; money comes from and goes back to the society etc. Thus, students must know that even if risks do not measure the same weight, they are not mutually exclusive; that risk mitigation/management strategies also differ and weigh differently.

Talking about risk management and mitigation strategies, it is important to underscore to students that risk can be dealt with differently. Watt (2010) cited by Mamai & Yinghua (2016, p.221) argues that "risk management is the process of identification, analyzing and either the acceptance or mitigation of uncertainties in the course of running an entity…..Risk mitigation is an action, consciously taken by the top management, to counter in advance, the effects on the business of risk events. Risk mitigation generally can take the form of risk avoidance, risk acceptance, risk transfer and risk reduction".

By clearly stressing different manifestations of risk and risk management strategies, students internalise in their mindsets that decisions must be taken after thoroughly assessing the pro's and con's; that entrepreneurial decisions are based on calculated risks; and that when the risk is unavoidable the best an entrepreneur can do is to manage it. He can do it either by sharing (partnership, networking), accepting or living with it in the short or long term.

2.1.3.4.Autonomy

This EO dimension is also called independence or freedom. It is one among individuals' decision making characteristics. It refers to the ability of the person to make his or her own decisions. That makes it the central premise of the concept of informed consent and shared decision making. It is connected to the concept of innovation and creativity, which inherently means that one does something different, with less concern for what is conventional (van Gelderen & Jansen, 2006). When autonomy is assessed as a start-up motive, elements such as freedom, independence, being one's own boss, and choosing one's own methods are expected. Such elements can be categorised in groups of authority (being boss, control own time or own approach to work, responsibility, leading, rather than being led), self-actualisation (realise dream, creative need, create something), challenge (challenging, exciting, inspiring, motivating), and motivation (as a state of independent self-determination). Put differently, conceptualisation of autonomy for small business starters

emphasises on independence ("others do not determine what I will do"), on self-congruence ("I want to do my own things"), and power to decide ("I want to be the one that sets the rules") (Ibid).

Applied autonomy within an organization means the local self-determination of the employees. There, employees act independently, and they do not ask management for permission in advance to take action or introduce new initiatives. Explained differently, autonomy is often compared to decentralised decision-making where the organisation's frontline workers can act on unexpected opportunities or threats without having to ask top management for permission (but in larger organization, they will often be monitored by middle managers) (Pedersen, 2018). This statement introduces structural division of responsibilities whereby, in their working relationships, some influences may be exercised between employees of different statuses. Here a new terminology of 'responsible autonomy' comes in to refer to how one or more employees have autonomy to decide what must be done, but are then also responsible for the outcome of these decisions.

With responsible autonomy individuals have freedom with responsibility and this responsibility is tied with transparency. However, with the existence of the structural influence one wonders whether autonomy is "taken or given". The argument by Pedersen (2018, p.6) is two folds: "the first dimension implies that employees sometimes "break the rules" and reserve the right to make decisions themselves (even though they might not have the authority to do so), the second dimension describes that management wishes to give the employees permission to make decisions on their own. While the first type is informal and forbidden, the second type is formal and approved". If one is informal and forbidden on one side, it is more appropriate to self-employed individuals. These people decide on their destiny and are responsible for any inconveniency arising from their decisions. They are willing to use unconventional means and strategies with self-confidence that they can be successful. On the other side, formally and approved behaviours means being subject to intervention and interferences from partners and employers (direct or indirect). Such a behaviour induces limited autonomy and shared responsibilities which, as a consequence, may reduce the level of self-expression, self-confidence, commitment and involvement in the process.

Given the interconnection between autonomy and other EO dimensions, companies that want to prosper will have to actively work with employee autonomy as autonomy is connected to innovation, flexibility and adaptability. Since these dimensions are essential elements for

company development and effective performance, managers should allow autonomous projects to happen for constructively developing their businesses.

2.1.3.5.Competitive aggressiveness

Competitive aggressiveness is another important EO dimension discussed by Lumpkin & Dess (1996) as a strategy for a firm to outperform competitors in the market. This strategy is characterised by a strong offensive posture or aggressive responses to the actions of competitors which enables a firm to be a decisive player in a field of rivals and to act forcefully to safeguard or advance its position. Expressed differently, competitive aggressiveness is essentially a firm's response to competitive threats. According to Bustani (2019), aggressive strategies can include price cutting, increased spending on marketing, quality and improved production capacity. Companies can use them for either promoting their products in markets identified by competitors or through analysing and attacking competitor's weaknesses. This aggressiveness involves market actors who compete for leading or increasing market shares. It is also clear that users can accept to incur short term losses in terms of profit margin while targeting long term profitability that sits on larger customer base and/or loyalty. When market competitors interact, they apply both proactive and innovative strategies. To recall, proactiveness refers to how a company relates to market opportunities in the process of new entry, thereby influencing trends and creating demand. Competitive aggressiveness, however, refers to how companies relate to competitors in areas of performance efficiency (Lumpkin & Dess, 1996).

From firm to individual scale (though it can apply to both), competitiveness requires a high degree of personal energy, flexibility, intelligence, and creativity in regulating activity. Competitive personality applies to different situations, it involves various types of activity in which conflicts of interest occur, and it is a process of managing advantages. Depending on their nature, Klyueva (2016) assert that the nature of competition in the social sciences implies a potential for rivalry over advantages that ensure individuals' survival in the context of social struggle. Despite that rivalry is a common practice, competitors can compete and cooperate. On a positive side, cooperation results in readiness to be helpful, supportive, and respectful; in openness in communication; in trusting and friendly attitudes; in sensitivity to common interests; and in orientation toward enhancing mutual power rather than power differences. On a negative side, competition induces coercion, threats, deception; poor communication; suspicious and hostile

attitudes; anxiety; fear of failure; the aspiration to prevent others from winning; self-orientation etc (Klyueva, 2016). No matter the market circumstances, competition and cooperation will always exist in the market/society. Students must be educated in how best they can behave in relation to the elaborated EO matters.

2.2.Entrepreneurship education

Entrepreneurship is not only a research concept but also an educational subject, which in accordance with the research field displays a variety of ideas on how to educate in, for, through or about entrepreneurship (Hoppe, 2016; Leffler, 2014). It should be recalled that there is no consensus on what entrepreneurship education actually 'is' due to lack of a universal pedagogical recipe on how to teach entrepreneurship (Fayolle & Gailly, 2008). It is however agreed that entrepreneurship concept in education context is supplemented by other concepts which, in their own research traditions and definitions, encompass entrepreneurial learning; entrepreneurship education and more lately enterprise education (Kyrö, 2008). Entrepreneurship programs and courses provide the context and content to help students learn and apply skills and behaviours intended to create value in entrepreneurial firms. Creativity skills enable students to discover new ideas and opportunities that contribute to innovation (Gundry et al., 2014). Some educators may be more inclined to work at different ends of the enterprise and Entrepreneurship spectrum; however, it is the appropriateness of the student's learning that should remain the focus (QAA, 2018).

The Quality Assurance Agency of Higher Education (QAA, 2018) in the United Kingdom acknowledges the importance of learning about and experiencing enterprise and entrepreneurship while at university. This is because it can have several benefits. For example, first, it gives students alternative perspectives on their career options and ultimately, the confidence to set up their own business or social enterprise. Second, enterprise competencies will be useful to those in employment, or those who become self-employed and work on a freelance or consultancy basis. More advantages on personal or organizational levels can be identified and developed too. Personally, they include developing a 'can-do' confidence, a creative questioning approach, and a willingness to take risks, enabling individuals to manage workplace uncertainty and flexible working patterns and careers. For the organizational benefit, enterprising competencies such as teamwork and the ability to demonstrate initiative and original thought, alongside self-discipline

in starting tasks and completing them to deadline, are essential attributes that have been identified by employers as priorities.

In the narrow or traditional sense for example, Cooney (2012) states that entrepreneurship was strongly associated with the creation of a business and therefore it was argued that the skills required to achieve this outcome could be developed through training. EE is defined as opportunity recognition, marshalling of resources in the presence of risk, and building a business venture; a collection of formalized teachings that informs, trains, and educates anyone interested in business creation, or small business development (Kourilsky, 1995; Bechard and Toulouse, 1998; Kirby, 2004; EU, 2004)

In a broader or modern sense EE is a way of thinking and behaving that is relevant to all parts of society and the economy, and such an understanding of entrepreneurship now requires a different approach to training (Cooney, 2012). In the same perspective, EE means preparing not only "an entrepreneurial person" who may become self-employed or owner of an enterprise, but also is able to pursue entrepreneurship and innovation as an employee and/or exhibits "enterprising behaviour (Gibb, 2002a; Vesper and Gartner, 1997; Leitch and Harrison, 1999; Peterman and Kennedy, 2003). It is this definition that guides all interventions and interpretations in this study. When dealing with students, some will become entrepreneurs while others will be employed by some organizations and will use their intrapreneurial competences for organizational benefits. Some will have to confront environmental challenges and uncertainties as owners of enterprises whereas others will have to depend on the organizational values, principles and guidance.

2.2.1. Enterprise education versus entrepreneurship education

Given the spectrum for enhancing entrepreneurial skills, it is necessary to differentiate enterprise education from entrepreneurship education. Educators are appealed to define clearly the focus of their approach when designing training programs. The focus might be about "enterprise development" or traits applicable across modern definitions of entrepreneurship. According to QAA (2018) enterprise education is the process of developing students in a manner that provides them with an enhanced capacity to generate ideas, and the behaviours, attributes, and competencies to make them happen. It extends beyond knowledge acquisition to a wide range of emotional, intellectual, social, cultural and practical behaviours, attributes and competences, and

is appropriate to all students. These are all underlying factors that can enhance employability prospects as well as be taken further through entrepreneurship education.

Enterprise behaviours can include taking the initiative, making things happen, reflecting, communicating, pivoting and adapting, storytelling, taking responsibility, networking, personal effectiveness and managed risk taking. Enterprise attributes reflect open mindedness, proactivity, curiosity, self-efficacy, flexibility, adaptability, determination and resilience. Enterprise competencies are related to intuitive decision making, identifying opportunities, creative problem solving, innovating, strategic thinking, design thinking, negotiation, communicating, influencing, leadership and financial, business and digital literacy (QAA, 2018)

The enterprise education is mostly geared towards producing employable graduates with an awareness, mindset and capability to generate original ideas in response to identified needs, opportunities and shortfalls, and the ability to act on them, even if circumstances are changing and ambiguous. In short, it aims at producing dreamers who do; those who have an idea and make it happen. Enterprise education can also be viewed in terms of preparing individuals for engagement in an entrepreneurial process (one could say an entrepreneurial career); thus requiring development of entrepreneurial competency, i.e. knowledge (know what), skills (know how), and attitudes or values and behaviour (Know Why) (Middleton & Donnellon, 2014).

Complementary to enterprise education is entrepreneurship education which builds upon the enterprising competencies of students. Such students are capable for identifying opportunities and developing ventures, through becoming self-employed, setting up new businesses or developing and growing part of an existing venture. Entrepreneurship education focuses on the application of enterprising competencies and extends the learning environment into realistic risk environments that may include legal, funding issues, start-up and growth strategies (QAA, 2018).

Whilst some researchers (Garavan and O'Cinneide, 1994a, b) argue that there is a conceptual difference between entrepreneurship education and enterprise education where the former has to do with creating an attitude of self-reliance and the latter is for creating opportunity-seeking individuals; others, like Gibb (1993), as echoed in Garavan and O'Cinneide (1994a, b), argue that the two terms are conceptually the same, but contextually different. According to Gibb (1993) entrepreneurship education is a term mainly used in America and Canada, and enterprise education in the UK and Ireland. Therefore, they can be used interchangeably and/or the term

entrepreneurship education can stand as a generic nomenclature to other similar educational processes (Mwasalwiba, 2010; QAA, 2018).

2.2.2. Entrepreneurship education and entrepreneurial competences

In their article "Personalizing Entrepreneurial Learning: A Pedagogy for Facilitating the Know Why", Middleton and Donnellon (2014, p.167) argued that "as the global diffusion of entrepreneurship education continues, along with increasing investment in, and expectations of, educational initiatives, it has become important to articulate what we are teaching and why, along with the specifics of where, how, and to whom." In such reasoning, Mwasalwiba (2010) reviewed literature about entrepreneurship and identified that entrepreneurial teaching methods illustrate the complexity and incongruence of entrepreneurship education; most entrepreneurship education addressed knowledge about entrepreneurship in general or about the entrepreneurial process of starting a new venture, while fewer programs provided knowledge specifically for engaging in the process. With such unclear demarcation and despite their differences, the pedagogical practices amount to teaching the entrepreneurial "what" and "how", both of which represent valuable parts of an entrepreneurial education.

- **Entrepreneurial "What to know" or "Know what"**

This is understood as the cognitive knowledge the individuals develop about what to do in order to perform entrepreneurship (Kyrö 2008; Nutley et al., 2003). Gartner and Carter (2003) have identified a set of 26 actions important for venture creation which have subsequently been grouped by Liao and Welsch (2008) into four categories: planning activities, establishing legitimacy, resource combination, and market behaviour. It is argued that this concept is essentially generic to new venture creation, in that the knowledge can be conveyed independent of the individual learner. Without the know-how and the know-why, the individual learner cannot be aware of, react to, or even create the many contextual contingencies that shape what the entrepreneur can, should, and will do. Hence, the know-how and the know-why are tailored to the person: her situation and her particular make-up of capabilities, limitations, attitudes, and values (Middleton and Donnellon, 2014).

- **The entrepreneurial "how to do" things or "know how"**

This addresses both functional knowledge (steps to take to achieve an outcome) and functional capabilities specific to the individual (how to effectively put knowledge into practice) (Nutley et

al., 2003). In other words, it is the knowledge of the process through which entrepreneurial activities are carried out. Know what and the functional "steps to take" part of know-how can be considered as more generic, in the sense that the knowledge required can be conveyed independent of the individual learner.

Knowledge about how to do something, particularly how to do something well, can also involve knowledge specific to the person and is often also discussed in terms of skill. To Middleton and Donnellon (2014, p.176), "know-how includes the steps to take in creating a new venture, the sequence in which these are typically or ideally done, and the approaches that adapt the generic process to the specific context and the individual characteristics of the person navigating the process. The personalized approach involves knowledge of how to carry out the steps in the most efficient and effective means possible, given the skills, strengths, and values, among other particularities, of the individual". Although the "know-how" is a practice-driven concept, it does not necessarily result into action. When teaching entrepreneurship to students, educators increase students' potential to act upon some realities but certain skills may not be applied due to other factors.

- **The entrepreneurial "Know-why"**

The "know-why" can be defined as the personal logic, encompassing both reason and emotion, which enables the individual to act entrepreneurially, and specifically, to create new ventures. It provides the self-understanding and decision to do the what and the how, stemming from an understanding that entrepreneurial logic is intuitive and holistic (Johannisson, 1999).

Middleton and Donnellon (2014) developed a framework of knowledge for entrepreneurial action that includes not only the entrepreneurial cognition, functional knowledge and capabilities, or skills (labelled as know what and know how) but also why one engages and persists in taking entrepreneurial action (know why). They argue that the framework helps to understand what part of what the nascent entrepreneur (i.e individuals who enrol in entrepreneurial educational programs, engage in entrepreneurial activities but have not yet created new ventures) learns that may be delivered through the content about a subject area and what part of the learning may be reflectively developed through engagement into the process.

Figure 1: Knowledge framework for entrepreneurial action

Generic	Knowledge about entrepreneurial concepts Knowledge of the activities typical to an entrepreneurial process	Tools and guidelines for entrepreneurial action Simulation of entrepreneurship	
Personal		Immersion in entrepreneurship Demonstration of competency in entrepreneurship	Applying own means to entrepreneurial process with belief that achievement is possible Sensemaking of own entrepreneurial competency
	"Know What" ***Knowledge of what needs to be done***	***"Know How"*** ***Knowledge for performing entrepreneurial activities***	***"Know Why"*** ***Knowledge that sustains personal engagement and legitimizes action***

Source: Middleton and Donnellon, 2014

Like the figure 1 shows, three sections are demarcated. One about theoretical discussion of the literature on entrepreneurial education and entrepreneurial learning (know what); another presenting a discussion of the method, context, and outcomes (know how); and the last presenting a description of the pedagogical approach for developing know why along with the challenges it poses (for students, educators, and institutions). It helps to know and understand why individual decides to engage in entrepreneurial action (Middleton and Donnellon, 2014).

Having defined enterprise and entrepreneurship, it appears that, from whatever angle one looks at it, students with both enterprise and entrepreneurship competencies may apply their abilities in a range of different contexts, including new or existing businesses, charities, non-governmental organisations, the public sector and social enterprises. They have business skills as well as employability competences. Thus, EE can be summarised as the realisation of ideas, through an enhanced understanding and application of business processes within the legal and ethical constraints that are found in the context of their chosen venture (QAA, 2018).

2.2.3. Entrepreneurial learning: knowing versus becoming

After conquering educational space, researchers agreed that entrepreneurship can be taught, and various teaching/learning approaches were initiated. Entrepreneurial learning emerged in traditional entrepreneurship theory in the late 1990s, and the purpose was to describe how (small) business entrepreneurs learn (Cope, 2003; Rae, 2005). With the development of educational contexts, today's use of entrepreneurial learning terminology is somewhat different. Entrepreneurial activities are perceived as action-based educational means to achieve learning that is hard to achieve via more traditional teaching methods (Leffler, 2014). Today, student-centred learning models are largely preferred to teacher-centred types of learning. The learning process for students (learning through entrepreneurial actions) becomes more central at the expense of teachers, who in turn take the role as educators; organizing different student-centred learning activities.

According to Hope (2016), the development of entrepreneurship learning has led to the emergence of two divergent traditions of thought that both use the term 'entrepreneurial learning', albeit differently. First, within business studies focusing on entrepreneurship education, entrepreneurial learning is a traditional and bounded view on how entrepreneurs learn as they start and run their businesses. Second, within the realms of mainly non-business studies focusing on enterprise education, entrepreneurial learning is rather a more pragmatic view on how the concept itself can be used to challenge bounded pedagogical and didactical ideas (Kyrö, 2008). Thus, looking at how disciplinary knowledge and skills, especially in science majors, predict high potential for immediate employment of young graduates, educational approaches that facilitate students to integrate market skills when they are still at campus are a big asset. As the levels of unemployment keep increasing in many countries and in Rwanda specifically, the lack of market-oriented skills and competences prevent students from meeting their expectations. They should therefore be minimised.

When talking about entrepreneurial learning, the motives behind the learning should not be ignored. These motives determine not only the involvement of the learner during the process and after, but also influence the teaching/learning approach. Personal motivation and drive have for example been regarded as a selection criterion and a means in business focused educations but an end in policy and education; in policy is described as a desired "sense of initiative and entrepreneurship" (EU, 2006). In compulsory school this desired enterprising mentality is labelled

internal entrepreneurship (Komulainen et al., 2011) in order to differentiate it from the business schools normal focus on external entrepreneurship, i.e. to enhance skills for setting up businesses (Leffler, 2014).

Based on the means and ends in education, one can observe divisions of different kinds of entrepreneurship education, where entrepreneurship educators differentiate between education in, for, through and about entrepreneurship. Although the subject matter is or may be the same i.e "entrepreneurship", learners get different outcomes when different teaching/learning approaches are applied. If educators decide to follow classical teaching - explaining concepts and theories about entrepreneurship and how to start a business and develop a business plan-, results will be different if the same educators let students explore, within their limited knowledge, what and how starting the business looks like. Being taught how to do things and learning from own mistakes inevitably produce different outcomes. It is commented that early business educations were quite analytical 'about' entrepreneurship aiming at understanding and explaining entrepreneurship (Bjerke, 2005); and that many students didn't find it especially useful (Katz, 2003). From Katz's point of view a new more practical action-based education tradition grew with education 'in' and 'for' entrepreneurship. Thus, learning by doing as entrepreneurs do moved the field towards a more didactical approach to entrepreneurship, but still with the businessman as a role model.

2.2.4. Entrepreneurial education process

In its quality of being a process of providing individuals with the ability to recognize opportunities and of equipping them with the necessary insights, self-esteem, knowledge and skills to react upon the opportunities (Jones and English, 2004); entrepreneurship education aims at fostering entrepreneurial attitudes, spirit and culture among individuals in the general community (Mwasalwiba, 2010). Entrepreneurial learning often takes place within institutions without bearing the 'label' of enterprise or entrepreneurship, and can often be referred to, for example, as 'innovative thinking' or 'design thinking' when the goal is to create value by solving a problem or identifying new opportunities. Some educators may be more inclined to work at different ends of the Enterprise and Entrepreneurship spectrum; however, it is the appropriateness of the student's learning that should remain the focus (QAA, 2012). It is argued that learning objectives are narrowed in terms of what educators (or/and students) intend to achieve and hence a determinant for the choice of pedagogical approaches. This leads us to differentiation between education "for", "about", "in" and "through" entrepreneurship.

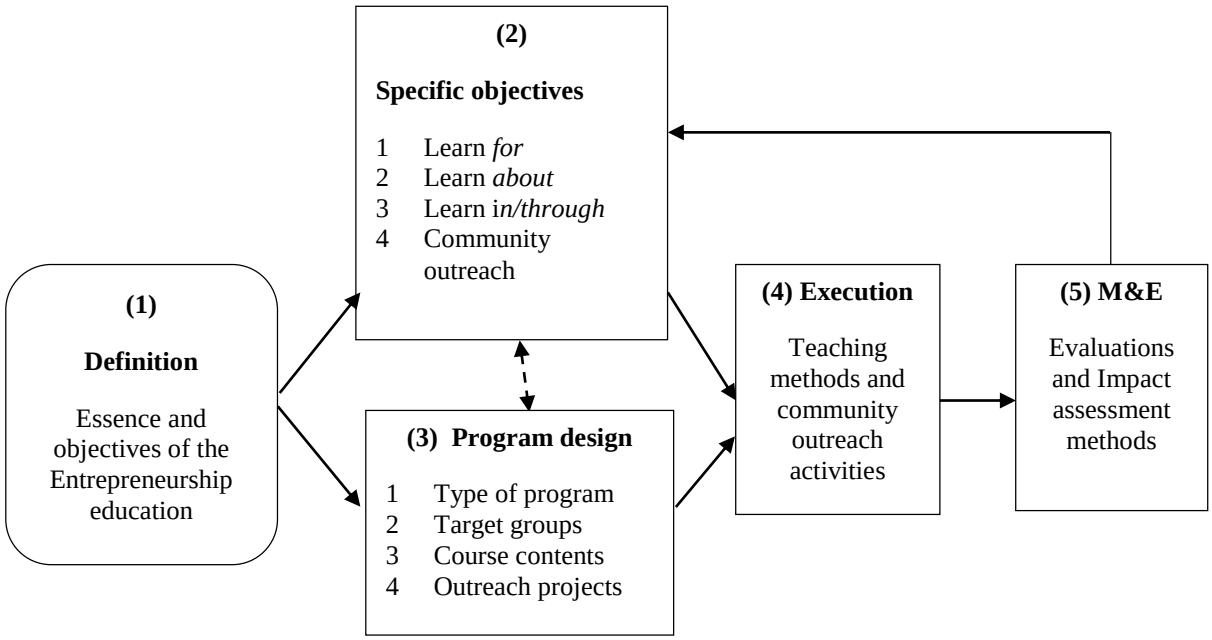
The education “for” entrepreneurship means to create an entrepreneur. In other terms, it is creating the individual who is destined to starting a new venture. Educating for entrepreneurship addresses both the present and potential entrepreneurs with the aim of stimulating the entrepreneurial process, providing them with the tools to starting a business (Co and Mitchell, 2006). This “education for” entrepreneurship answers the question “Can entrepreneurship be taught?” (Henry et al., 2005 a,b) which is in actual fact the most desired outcome and yet highly debated question. On the other side, learning “about” entrepreneurship is to obtain a general understanding about entrepreneurship as a phenomenon (Hytti and O’Gorman, 2004). This objective may also include sensitization activities to different stakeholders including policymakers, financers and the general public on the role of entrepreneurs in the community. Traditional entrepreneurship education relied much on explaining and elaborating the role of and the link between entrepreneurship and national economy.

The objective of educating “in” entrepreneurship aims at making individuals more entrepreneurial (innovative) in their environment and more responsible for their learning and career life (Johansen and Schanke, 2012), or in their existing firms or place of work (Dreisler et al., 2003; Henry et al., 2005; Kirby, 2004). Education “through” entrepreneurship is another term introduced by Kirby (2004) which refers to when educators use new venture creation to help students acquire a range of both business understanding and skills or competences. Mwasalwiba (2010) asserts that education “through” uses the entrepreneurial process itself to educate students. Teaching “through” requires that students establish a venture and learn by doing. Nevertheless, the two approaches (in and through) encompass the competence of perceiving new opportunities and the ability to make them work in a number of social areas (Johansen and Schanke, 2012). However, it seems educating “through” is more of a teaching approach in educating for entrepreneurship than an objective in itself.

There is no clear demarcation between “for and about” because educating for, if taken in perspective, is an objective that also encompasses all the other two aims (about and in). In fact, at any start of lecture session participants are expected to be given a general understanding on entrepreneurship which means they will have learnt about, whereas as the training progresses students are exposed to more advanced learning activities that are aimed at sharpening their innovativeness and equip them with opportunity discovery skills, which is also expected of those who are educated in entrepreneurship.

It might be possible that the entrepreneurial process is designed based on real problems owned by an external (to the university) party or problems authentic to the professional domain in which the students act. In such a context, the teaching approach will follow a project or problem-based learning approach. It can also be framed based on provision of general knowledge whereby learners get instructed or skilled in/for general knowledge about entrepreneurship. In such a context a different approach will be designed and applied. In either case, the course content may generally remain the same, but the teaching methods will change. Despite unclear demarcations in the course objectives, as Mwasalwiba (2010, p.27) concludes, "it is still of value for educators to have a pre-conception of aims on their specific educational programs. This may assist them to understand well in advance the expected impact of their programs and give them an advantage in the selection of the appropriate teaching methods and in the fine-tuning of other determining factors." He conceptualises such entrepreneurial education process as follows (adapted):

Figure 2: Mwasalwiba's Entrepreneurial education process



Source: Adapted from Mwasalwiba, 2010

2.3.Underlying theories

Enhancing entrepreneurial attitudes through education is about changing individuals' mindset and behaviours. Such behaviours can be observed through reactions in favor or against something (a challenge or opportunity). In a teacher-student environment, entrepreneurship education is about

equipping students with knowledge and skills that impact their way of thinking and reacting vis-à-vis market challenges and opportunities (this adds to disciplinary knowledge). A good number of researchers identified that the most effective methods to develop entrepreneurial skills are student centred learning and experiential learning, including through their own life experiences as "learning by doing (Garavan and O'Cinnelde, 1994; Greene and Rice, 2002; Bucha, 2009; WEF, 2009; Ferreira, 2011). These methods are supplemented by the contact with concrete examples of entrepreneurs who inspire students (Diaconu and Duțu, 2016). Therefore, two salient theories are behind this study. They involve Action learning theory and Expectancy theory.

2.3.1. Action learning theory

In their article "Theory to Practice: Action learning", Marquardt and Banks (2010) indicate that action learning was introduced in the 1940s when Reg Revans implemented action learning in the coal mines of Wales (Revans, 1982). This version is however disputed by the Business Week which in its issue of October 10, 2005 says that it was introduced in the past 125 years. Dispute put aside, action learning recently became a vital tool in the workplace, not only for solving complex problems but also for developing leaders and building teams (Kramer, 2008; Marquardt, 2004; Raelin, 2009). According to Revans (1982) action learning is for tackling the 'wicked problems' of organizations and society rather than the puzzles which are the focus of much conventional education and training. It can only if any efforts are conducted in the light of certain critical values[4].

It is argued that Revans was motivated by the potential human beings have in dealing with difficult challenges and problems through own learning experiences. He was not comfortable with prescribed learning formula that characterised traditional teaching; rather, he was convinced that individual development takes place through experiential learning that follows pragmatic approaches. Revans therefore sought the improvement of human systems by those who must live and work in them. Without prescriptive formula of how to learn and get wisdom, action learning simply relies on an idea that needs realization and is concerned with achieving useful change. With the profound learning that comes from being engaged in this process, it can never be

[4] http://www.mheducation.co.uk/openup/chapters/ 9780335245970. pdf, accessed on December 20, 2020

communicated as a simple formula or technique. In other words, individuals learn differently and they have to be well organized for achieving the objectives of learning.

Though no fixed formula is prescribed, action learning follows certain common principles. The masterpiece is that individuals come together to exchange, support and challenge each other in action and learning as highlighted by Marquardt & Banks (2010b, p.159) in the following 4 principles:

1. that learning be acquired in the midst of action and dedicated to the task at hand. Under normal circumstances, especially in organizations, participation is and must be voluntary (although one can be persuaded or encouraged);
2. that participants work on problems aimed at organizational as well as personal development and the intersection between them. That means each must own an organizational task, problem, or challenge or opportunity on which they are committed to act;
3. that learners work in peer learning teams to support and challenge each other. This is because people are very much more likely to succeed with the help of friends. Therefore, team or group members help each other think through the issues, create options etc.;
4. that its users demonstrate a learning-to-learn aptitude entailing a search for fresh questions over expert knowledge. This refers to taking action and learning from the experience of taking that action

Critics about action learning say it is time consuming. It is against this backdrop that multiple experiments have been initiated in order to attain strong learning and actions results in the shortest term limits. However, as developing an individual or organization does not happen overnight and that it is not a one-man's affair, collaborative efforts require that teams work together guided by a learning coach and team leaders as well. The advantage of working in (small) groups (also known as "sets") is that people tackle important organizational or social challenges and learn from their attempts to improve things.

From the perspective of leadership development, a comparison between action learning and other methodologies currently in use demonstrated that "action learning can be tailored to develop specific leadership competencies identified by individual team members, while, at the same time, developing other leadership skills needed in organizations" (Marquardt and Banks, 2010, p.161).

In entrepreneurship education, it is obvious that skills and competences developed can serve learners' personal interests as well as organizational interests. This also applies to employability skills that every employer is looking into university graduates. With team development, if the intention is to create a venture and if other conditions are united, the theories, principles, and practices of action learning are very supportive. In this sense, the better the atmosphere in the creation process of team the higher the potential for strong business outcomes. From this, it is deductible that not only the action learning enhances the learning but also perfects the experience obtained from practice.

Action learning appeals action research which tends to be cyclic (i.e. similar steps tend to recur, in a similar sequence); participative (i.e. the clients and informants are involved as partners, or at least active participants, in the research process); qualitative (i.e. it deals more often with language than with numbers); and reflective (i.e. critical reflection upon the process and outcomes are important parts of each cycle). Such processes have largely been discussed by Kolb (1984) and Laurillard (1993, 2013).

2.3.2. Expectancy theory

The expectancy theory of entrepreneurship (Renko et al., 2012) originates from Vroom's (1964) behavioral theory. Expectancy theory asserts that the establishment of a new enterprise is one of the most important outcomes of entrepreneurial efforts, and effort exerted is closely related to the individual's motivation (Davidson et al., 2002). The actions of an individual are driven by expected consequences; people start and operate their own firms for a variety of reasons other than maximizing economic returns (Wiklund et al., 2003); however, without economic motives, it is almost impossible for people to exhibit entrepreneurial behaviours.

Individuals (students in this study) will have the motivational force to enter into entrepreneurship as a career path if they value the profits of entrepreneurship, believe that they can start a business, and believe that if they start a business, that the business will yield profits (Renko et al., 2012). If they find profits from being employed are greater than profits obtained through self-employment they will deploy much efforts in searching for a job in another organization. This might be a temporary option as they seek for better alternatives during employment period.

The expectancy theory predicts that an individual will act in a certain way based on the expectation that the act will be followed by a given outcome and on the attractiveness of that outcome to the

individual. It can be assumed that if the expected outcome is high, the level of individual engagement into action will also be high because expected consequences are also high. From a behavioural perspective, an individual is likely to select an option with the greatest motivational forces (MF), which Vroom (1964) expressed by the following equation:

MF = expectancy x instrumentality x valence.

Expectancy portrays the effort - performance relationship. It is the probability (belief) that if someone does A (effort in doing) it will result in attaining B (which is the desired goals or achievement of a particular level of performance). It is based on the individual's past experiences, communication, feedback, or information from other people (Gatewood et al., 2002; Gatewood, 1993). However, Gatewood et al. (2002) argue that even if expectancies change based on direct and indirect experience or other beliefs, those changes may not be followed by corresponding changes in actual behaviour, like effort or performance.

Instrumentality reflects the belief that, if one meets performance expectations, he or she will receive a greater reward. If for example, an individual starts a firm thinking along the lines that financial rewards will follow, starting one's own business is the instrument to gaining financial rewards (Gatewood et al., 2002).

Valence is the value that an individual bases on this reward. An individual is likely to remain unmotivated if the benefit or satisfaction associated with the reward or outcome was not high enough (Gatewood et al., 2002). The reward or outcome (financial success in this case) should be attractive (high enough) for people to be motivated to attain it (valence).

Pursuing entrepreneurship is based on a person's utility function. This utility function reflects perceptions about anticipated income, the anticipated amount of work effort to achieve this income, the risk involved, plus other factors such as the person's desired attitudes for independence and perceptions of the anticipated work environment (Douglas and Shepherd, 2000). The same authors implicitly suggest that perceived utility is a function of an individual's perception of the likelihood that personal abilities and efforts in entrepreneurial activity will be successful (expectancy) and that the outcomes will be of value (instrumentality and valence). In this regard students' effort in relation to entrepreneurship or intrapreneurship will be motivated by the level of expected profits.

2.4.Pedagogies for entrepreneurial learning

Teachers and students occupy the central place in the learning process. However, a critical point in the development of effective entrepreneurial learning and teaching strategy is the basic understanding of how learning occurs. In each learning process, the education pedagogies will put emphasis on three overlapping domains: cognitive (knowledge), affective (attitude) and psychomotor (skills). While a student is mostly thought to be the recipient of knowledge transmitted by the teacher, it is also true that the teacher learns from the student. Plenty of studies analysed the transmission style of knowledge and skills between teachers and learners and concluded that teaching styles can be either teacher-centred or student-centred. As already stated in chapter 1, academic debates have failed to conclude on the best teaching style because results differ depending on many factors including but not limited to the learning objectives and motivations, didactics, ecosystem, expertise of the educators etc. However, they converge on the fact that classical teaching style (most applied) is facing competition from action-oriented or experiential learning styles in higher education (McCombs and Whisler, 1997; Weimer, 2002). Following are overviews of how students learn and how an educator can support the learning through the choice of an appropriate instruction method.

2.4.1. Bloom's taxonomy

Bloom's (1956) taxonomy refers to three overlapping areas or domains in which learning takes place: cognitive (knowledge), affective (attitude), and psychomotor (skills). According to Bloom, cognitive domain involves the development of intellectual skills from knowledge (knowing), recall and recognition, through to critical argument (synthesizing and evaluating). The affective domain includes the way emotions are handled, which involves values, enthusiasms, motivation and attitudes. This part is recognised as probably the most difficult to achieve because attitude is dependent and shaped most powerfully by 'real life' experiences and group learning. As for the psychomotor domain, it includes physical skill development such as movement, co-ordination and motor skills. The development of these objectives is most effective through performing and practising the activity. The learning can be simple or complex and the move from the simplest to most complex implies change in learning transmission approaches too (from mass instruction to small and individualized group learning). The following is the representation of how it takes place.

Table 3: Bloom's taxonomy of Learning Domains

Domains	*Cognitive*	*Affective*	*Psychomotor*
Lower level	*Knowledge; thinking*	*Feeling; attitude*	*Practical Skills*
	Knowledge	Receiving	Perception
	Comprehension	Responding to Phenomena	Readiness to act
	Application	Valuing	Guided response (practice)
	Analysis	Organization	Mechanism (routine response)
Higher level	Synthesis	Characterization (internalizing values)	Complex overt response
	Evaluation		Adaptation, origination

Source: Gibb & Price, 2014

Less demanding objectives will tend to use mass instruction techniques whilst high demanding or involving objectives will tend to use small groups or personalised instruction techniques.

2.4.2. Psychological traditions

Building on Bloom's taxonomy, Ernest Hilgard introduced the concept of conation in 1980s which he says correlates with cognitive and affective domains. Cognitive domain involves the development of intellectual skills from knowledge (knowing), recall and recognition, through to critical argument (synthesizing and evaluating). Conation embraces the active drive to make sense of something; as any inclination, drive, or desire to do something (within such notions of motivation, commitment, impulse and striving). According to Hilgard (1980) conation is one of the three processes underlying three central human functions including cognition (perception, memory, and the processing of information), affection, and conation as the aspect of mental processes or behaviour directed toward action or change and including impulse, desire, volition, and striving. In this line of impulse or action, conation (which is closely associated with self-efficacy) relates to 'how' tasks are processed and provides insight as to how individuals are motivated to undertake tasks. Self-efficacy (especially in the field of entrepreneurship) is 'the belief in one's capabilities to organise, execute the courses of action required to manage prospective situations' (Bandura, 1995) and succeed in specific situations. There is a very close relationship between self-efficacy and specific task-oriented behaviours.

The self-efficacy belief can positively or negatively impact upon behavioural choices (decision making; risk taking; engagement in new opportunities), motivation (ability to start and complete tasks) and response to failure (Gibb and Price, 2014). According to Bandura (1997) there are four

sources influencing self-efficacy beliefs. They include enactive mastery, role modelling and vicarious experience, social persuasion, and an individual's judgment of his/her psychological state such as anxiety and arousal. He discovered that, on one side, when an individual's personal efficacy is low, the individual is less likely to attempt any action. On the other side, the higher the self-efficacy the more likely the individual would take action. Self-efficacy in individuals is also dependent on parental influences.

Regarding the development of self-efficacy in children and adolescents, Studdard (2012) concurred with Dyer (1994) that children of entrepreneurs are often more likely to pursue an entrepreneurial career path rather than working for someone else. This is due to the fact that entrepreneurial parents are children's role model, use social persuasion for the behaviour desired to be instilled in their children; and involve their children in the family's firm to either help the family financially or to provide their children with the skills, values, and confidence that comes from being entrepreneurs. By doing so, parents build children's entrepreneurial self-efficacy.

Close to self-efficacy is another behavioural-linked concept of personal initiative which means to be self-starting, proactive, and persistent (Frese & Fay, 2001). Self-starting implies that a person does something without being told, without getting an explicit instruction, or without an explicit role requirement. It also means taking initiative for fixing a problem even though this is not part of the job description or dealing with issues that are not obviously related to the task. Concerning proactivity, it means to have a long-term focus and not to wait until one must respond to a demand. This pre-emptive behaviour stems from the individual ability to identify things to come (new demands, new or reoccurring problems, and emerging opportunities) and to do something proactively about them. Thus, problems and opportunities are anticipated, and the person prepares to deal with them immediately (Frese and Fay, 2001).

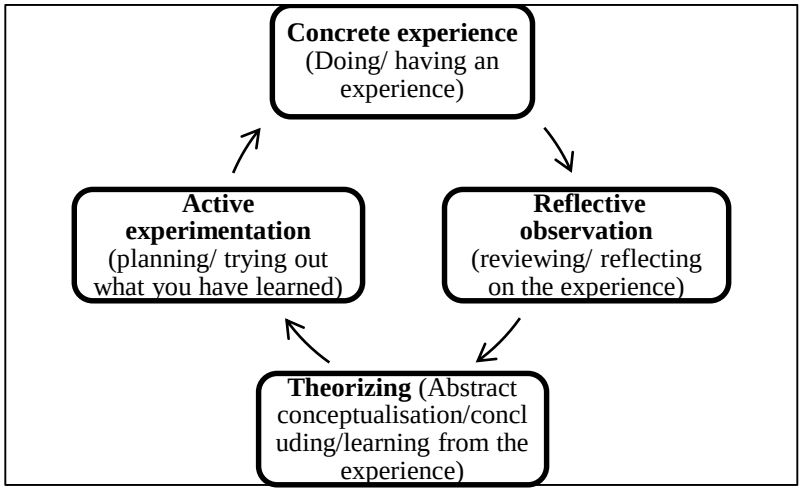
In the process of initiativeness things are changed, tasks are added or modified, past technical barriers and other people's resistance and inertia have to be overcome. Consequently, people affected by the changes will have to adapt to something new which pushes them to abandon their routines; self-inflicted persistence imposes itself and is therefore required to reach own goal. It must be remembered that though majority of employers will like people with personal initiative, it is not always welcomed by all supervisors as some might interpret it as going beyond the boundaries of one's jobs. It therefore should be exercised within certain limits.

2.4.3. Kolb's experiential cycle

David A. Kolb believes "learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p.38). Convinced that students learn most effectively at deeper levels if they are actively engaged in the process (rather than being passive receivers of information), Kolb (1984) created a cyclical model, also termed 'Kolb's experiential learning', which identifies four key stages through which the student passes. They include:

1. *Actual or concrete experience or "doing":* It is considered the first stage in which the learner actively experiences an activity such as a lab session or field work;
2. *Reflective observation or "observe"*: Is the second stage where the learner consciously reflects on that experience. Thought to be generally the most difficult for most learners, they are asked to articulate how they 'feel', reflect upon what they learnt, how they learnt, why they learnt and finally whether the learning experience could be more effective;
3. *Theorizing* is the third and also the critical stage for learning that builds knowledge and supports further reflection. It is through theorising that the learner attempts to conceptualize a theory or model of what is observed;
4. *Active experimentation also known as "Plan"* is the final stages that reflects and derives from "planning learning". This is where the learner tries to plan how to test a model or theory or plan for a forthcoming experience. It can be involvement in the learning objectives; engagement with approaches/options; or creation of a learning contract (Gibb and Price, 2014).

Figure 3: Experiential learning- Kolb's cycle



Source: Adapted from Gibb and Price, 2014

In reference to the above stages, Kolb identified four corresponding learning styles: 1) assimilators- individuals who learn better when presented with sound logical theories to consider; 2) convergers- individuals who learn better when provided with practical applications of concepts and theories; 3) accommodators- individuals who learn better when provided with “hands-on" experiences; and 4) divergers - individuals who learn better when allowed to observe and collect a wide range of information[5]. It is therefore up to the educators to assess the target audience before and during the learning process to help everyone follow the course conveniently. This might require a mix of teaching approaches or the change of teaching environments.

2.4.4. Experiential learning: Ripples of Learning

Building on Kolb’s experiential learning, (Race, 2005, 2007) identified seven factors underpinning successful learning that, he suggests, all continuously affect each other (as ripples on a pond) rather than following Kolb’s view of a sequential cycle. According to Race’s approach which is also based upon experiential learning, motivation (‘wanting to learn’) is placed at the heart of learning and as the driver for all the other 6 ‘ripples (needing, doing, feedback, digesting, teaching, assessing). The 7 factors for successful learning (Race, 2005, 2007), as depicted in Table 4, are seen as mutually supporting the learning experience.

Table 4: Factors for successful learning

Factor	Meaning
1. Wanting to learn	Intrinsic motivation – interest and enthusiasm
2. Taking ownership – needing to learn	Extrinsic motivation
3. Learning by doing	Practice; trial and error; repetition
4. Learning through feedback	Reactions to the results
5. Making sense of what is being learned	Reflecting; digesting; turning information into knowledge
6. Deepening understanding	Students undertaking coaching; explaining; teaching

Source: Gibb and Price, 2014

No matter how best the course content might be, without proper teaching and delivery approaches, the learning objectives will not be effectively achieved. It is imperative that any understanding of the learning theory is anchored within the practicalities of teaching (classroom sizes; facilities; resource available etc). Thus, any educator has to reflect upon the intended learning outcomes,

[5] https://www.learning-theories.com/experiential-learning-kolb.html, accessed on November 21, 2019

with an awareness of the benefits and constraints emanating from the choice in different teaching/learning methods available. Doing so will help the educator to reflect on the best and appropriate approaches for transmission of the learning. The next point tells more.

2.5.Classification of learning transmission techniques

2.5.1. Elton's classification

In the exploration of the evolution of education technology, Elton (1977) identified three core approaches to the transmission of learning that he generally describes as: Mass instruction techniques, Individualised learning, and Group learning. He also identifies the role of the teacher, weakness and strength of each transmission approach. In his conclusions, Elton recognizes that mass instruction techniques, such as lecturing, are most effective at the transmission of information for recall as knowledge, whereas group learning and small group work supports the development of higher level skills, the foundations of an effective teaching and learning strategy can be created (Gibb and Price, 2014). Educators must determine exactly what is being taught through the development of appropriate learning outcomes. This is because the selection of the most appropriate delivery method is driven by the learning outcome sought and the domain level at which it needs to be employed by the learner. Therefore, knowing what, for whom, how and why, are crucial for effective delivery and attainment of the learning objectives.

Table 5: Elton's broad classification of teaching/learning

Classification	Examples	Role of the teacher	Less effective	Strength
Mass instruction techniques	Lectures Broadcasts	Traditional Controller Expert	Development of higher cognitive affective domain (attitudes)	Transmission of lower cognitive areas
Individualized learning	Programmed learning Directed self-study	Producer Tutor Guide	Achieving higher cognitive or non-cognitive objectives	Master area at learner's own pace
Group learning	Tutorials; seminars projects	Organizer Facilitator	Teaching facts / principles	Deeper understanding (higher cognitive) (process centered activity)

Source: Gibb and Price, 2014

In order to develop effective learning outcomes, it is generally agreed that, to be applicable to any learner and at any level, they need to meet the following criteria:

- Active – it describes what students can do at the end of the program of study
- Attractive – students want to achieve it (meaningful to them)
- Comprehensible – students know what it means (clear)
- Appropriate – to the student's current goals and career plans (again, meaningful)
- Attainable – most students will mostly meet it, with due effort (reasonable)
- Assessable – we can see if it has been achieved (demonstrable)
- Visible – in the course booklet and on any virtual learning environment (accessible).

In the course notes of International Entrepreneurship Educators Programme, Gibb and Price (2014) state that entrepreneurial learning outcomes that every program should have can range from - to: developing entrepreneurial behaviours, attitudes and skills; creating empathy with the entrepreneurial life world, inculcating key entrepreneurial values; motivation to entrepreneurship career; understanding of processes of business entry and tasks; acquiring generic entrepreneurship competencies; having key minimum or basic business in "how to do things"; and managing relationships.

Given the intended course objectives, it is imperative to identify and make choices of the best teaching styles that instructors can utilise in their classrooms for entrepreneurial learning. Entrepreneurship education encompasses more applied instructional mechanisms, using computer and real-life simulation experiences, guest speakers as role models, and/or completing business plan projects (Studdard et al., 2012).

2.5.2. Teacher-Centred

In the history of education this is considered as the dominant traditional teaching style or specifically, teacher-centred instruction, in higher education. It is characterised by students' passive learning whereby they are just recipients of teachers' knowledge and wisdom. The emphasis is placed on lecturing, memorization and taking a variety of tests (Studdard et al., 2012). In entrepreneurship education, this corresponds mostly to teaching "about" and processes of entrepreneurship. Learners have no or very little control over their own learning since teachers make all the decisions about whatever happens in the classroom especially concerning the curriculum, teaching methods, and the different forms of assessment. Critics about this approach like Duckworth (2009) and Ahmed & Ain (2013) assert that teacher-centred learning actually prevents students' educational growth. In line with this critic, the learning in entrepreneurship

education goes beyond memorization and testing to cover learning how to think and become a lifelong learner. This requires more involvement of the learner.

2.5.3. Learner-centred

As opposed to teacher-centred learning, in a learner-centred classroom, students are actively learning and they have greater input into what they learn, how they learn it, and when they learn it. That said, students have and take responsibility of their own learning and are directly involved in the learning process. The teaching style focuses on how students learn instead of how teachers teach (Weimer, 2002; Wohlfarth et al., 2008) . In a learner-centred classroom, teachers leave some freedom to students and abandon lecture notes and power point presentations for a more active, engaging, collaborative style of teaching (Wohlfarth et al., 2008). The teacher becomes a moderator or facilitator in the learning process.

It is also argued that the learner-centred instruction has the reputation of being most suitable for the more autonomous, and more self-directed learners who not only participate in what, how, and when to learn, but also construct their own learning experiences. This approach as Ahmed & Ain (2013) argues finds origin in the constructivist philosophy of teaching where learning-by-doing is fundamental. In the constructivism theory of learning, the learners are learning by doing and get direct experience rather than depending on the teachers' wisdom and expertise to transmit knowledge. Here below we compare teacher-centered and learner-centered paradigms.

Table 6: Comparison of Teacher-centered and Learner-centered paradigms

Teacher-Centered Paradigm	Learner-Centered Paradigm
Knowledge is transmitted from professor to students	Students construct knowledge through gathering and synthesizing information and integrating it with the general skills of inquiry, communication, critical thinking, problem solving and so on
Students passively receive information	Students are actively involved
Emphasis is on acquisition of knowledge outside the context in which it will be used	Emphasis is on using and communicating knowledge effectively to address enduring and emerging issues and problems in real-life contexts
Professor's role is to be primary information giver and primary evaluator	Professor's role is to coach and facilitate. Professor and students evaluate learning together
Teaching and assessing are separate	Teaching and assessing are intertwined
Assessment is used to monitor learning	Assessment is used to promote and diagnose

Source: Huba & Freed, 2000

In her comparison of the two teaching styles, Allen (2004) goes a bit deeper into pedagogical design and details the "what" and "how" of the learning process. The following table 7 describes more.

Table 7: Teaching- centered versus Learning-centered instruction

Concept	Teacher-Centered	Learner-Centered
Teaching goals	• Cover the discipline	• Students learn: • How to use the discipline • How to integrate disciplines to solve complex problems • An array of core learning objectives, such as communication and information literacy skills
Organization of the curriculum	• Courses in catalog	• Cohesive program with systematically created opportunities to synthesize, practice, and develop increasingly complex ideas, skills, and values
Course structure	• Faculty cover topics	• Students master learning objectives
How students learn	• Listening and reading • Independent learning, often in competition for grades	• Students construct knowledge by integrating new learning into what they already know • Learning is viewed as a cognitive and social act
Pedagogy	• Based on delivery of information	• Based on engagement of students
Course delivery	• Lecture • Assignments and exams for summative purposes	• Active learning • Assignments for formative purposes • Collaborative learning/Cooperative learning • Community service learning • Online, asynchronous, self-directed learning • Problem-based learning
Course grading	• Faculty as gatekeepers • Normal distribution expected	• Grades indicate mastery of learning objectives
Faculty role	• Sage on the stage	• Designer of learning environments
Effective teaching	• Teach (present information) well and those who can will learn	• Engage students in their learning • Help all students master learning objectives • Use classroom assessment to improve courses • Use program assessment to improve programs

Source: Allen, 2004

2.5.4. Laurillard's Conversational Framework

Developed by Diana Laurillard (1991; 1993; 2002) the transmission model known as Laurillard's Conversational Framework (LCF) depicts that learning is based upon "second order" experiences

of the world, whereby it is not enough to just have your view and experiences; you also have to examine other's views and arguments to fully learn. For the author, an effective teaching strategy needs to be based on an epistemology that "situates learning as a relationship between the learner and the world, mediated by the teacher" (Laurillard, 2002, p.86). In other words, the learning process is a matter of conversation between the teacher and the learner and asserts that this process must be constituted as a dialogue between teacher and student (or student and student), operating at the level of description of actions in the world. In such a relationship not always has the teacher to provide the communication/modelling cycle, it can also be provided in a peer group setting.

It should be recalled that in the learning process there is a zone of gaps that needs to be filled with the help of a more knowledgeable person or expert evaluator or more advanced peers. It is until a green light is given that one can claim responsibility to replicate or train others in the same thing. The green light is a testimony that the individual development is accepted both at the social level between people (interpsychological), and later, at an individual level within the individual person (intrapsychological) (Alshwiah, 2016; Vygotsky, 1978). Therefore, a learner's interaction with a teacher and more advanced peers can help them reach their potential Zone of Proximal Development (ZPD). As explained by Vygotsky (1978, p.86), the Zone of Proximal Development refers to "the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers". The ZPD deals with the cognitive gap that exists between what an individual can do alone and what they can do through collaboration (assistance) with more skilful peers. Once this level of ZPD is reached, the learner is enabled to perform similar tasks independently and to acquire skills for future use (Alshwiah, 2016).

Based on her conviction that in higher education much is about acquiring "ways of seeing the world", there should be associated pedagogic strategies that consider different forms of communication and associated mental activities. Laurillard classifies them into four levels: discussion, interaction, adaptation, reflection. The conversation between teacher and student operates at two levels mainly "discursive and interactive" which are also referred to as the "learning theory". The two main levels are characterised by discussion and negotiation of theory and concepts that take place between the teacher and learner (Lee, 2006) as well as "practical framework" (an experiential level) where the learners practice, process, adapt and reflect on

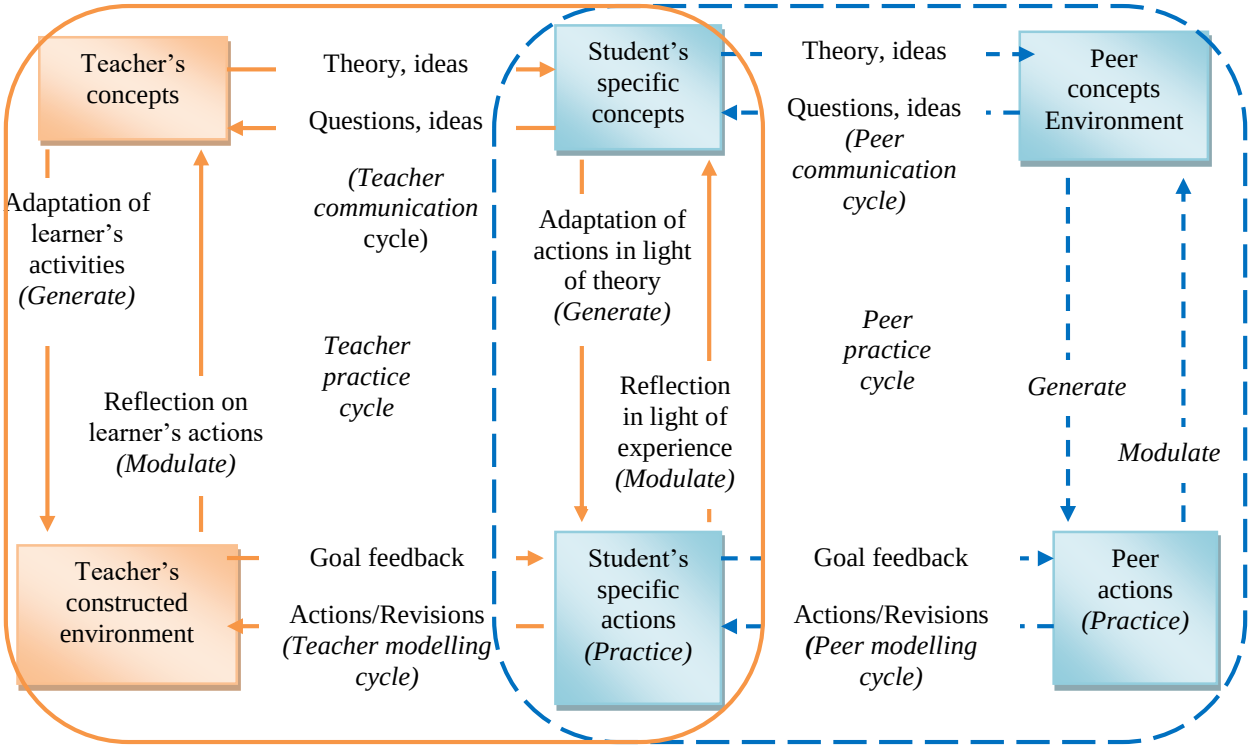
information (Neo et al., 2013). The other two levels fall between the main levels and include adaptation and reflection (Laurillard, 1998).

In explaining each level, discussion takes place between the teacher and the learner whereby teachers' and learners' conception should be mutually accessible, and both should agree on learning objectives. The adaptation of the learners' actions and of the teacher's constructed environment reflect on teachers' adaptation of objectives with regards to existing conceptions, and how learners must integrate feedback and link it to own conceptions. There should also be interaction between the learner and the environment defined by the teacher whereby the teacher must "adapt to world" (i.e. create an environment adapted to the learning task given to the learner) whilst focusing on support for task and giving appropriate feedback to the learner. Finally, there should be reflection of the learner's performance by both teacher and learner whereby the teacher should support the learner to revise his conceptions and to adapt the task to learning needs; and also where learners should reflect with all stages of the learning process (initial concepts, tasks, objectives, feedback...)

Based on the interaction between teachers and students or interaction among students in the learning process, there must be convergence of their ideas and/or understanding of a certain topic. In the learning environment where students are pulled by expert teachers, students' understanding should converge with the teacher's knowledge. The more students' feedbacks on their understanding get positive feedbacks from the teacher, the better the convergence. Then teachers know the learners grasp on the topic and the more their versions converge, the higher the full understanding and knowledge of the topic by the student. However, there might be some exceptions especially in certain types of experiential learning because not always can phenomena change in line with teachers' mastery of the topic. This can be a typical case in social sciences and, more so, in entrepreneurship education.

Laurillard's framework builds on iterative and interactive learning approaches (Laurillard, 1999) draws close similarities with experiential learning (Kolb, 1984), but most importantly stresses on the role of the teacher and peer-collaboration in learning (Laurillard, 2009). It integrates instructionism and constructivism theories of learning.

Figure 4: Laurillard's conversational framework



Source: Adapted from Laurillard, 2006, 2013

The concept of iteration is defined as the "process of learning and development that involves cyclical inquiry, enabling multiple opportunities for people to revisit ideas and critically reflect on their implication" (Timperley et al., 2013). Iteration can also be defined as back-and forth-going process towards learning, repetition or masterly learning in education (Block and Burns, 1976). It is argued that if students have not achieved a certain goal as intended by the teacher, they are presented with alternative exercises to fill the gaps in their knowledge. The repetition can take place through multiple forms, from different angles, using different examples or approaches.

Instructionism, like explained by Alshwiah (2016, p.44-45), is a "theory that depends on the teacher presenting a target structure, followed by the learner attempting to perform a task to achieve an intended goal". In this theory where learners are recipients, the focus is on the final product delivered to the students mainly via the teacher and without any form of peer-collaboration. Contrary to instructionism theory, constructivism is a theory based on learner-centred educational practices; focuses on the learning process and learning gained through collaboration. One of the major characteristics of constructivism is the co-production of the learning objectives as well as of outputs. Apart from teacher-to-learner communication cycle

where theories and ideas are explained and discussed, there is another cycle referred to as "peer-explanation cycle" whereby the learners modify their concepts by explaining them to their peers. In this process students recount (to the teacher) what they have discussed in groups so that their progress can be assessed. The activity aims at raising learners' awareness and not just memorization. Peer-communication cycle is followed (if necessary) by peer-practice-output cycle. Here the learners collaborate with their peers to produce output, which can be shared by others and evaluated by the teacher. Both cycles can be followed by peer-modelling cycle or 'students' reflection cycle' where the learners may modify their practice after receiving feedback from the teacher on their collaborative output (Alshwiah, 2016).

This peer-practice cycle is likely to produce better results in group learning where knowledge sharing, discussions, debates… lead to internal convergence. This internal convergence embeds internal reflection on the matter and is a precursor to an informed decision-making process. During peer-practice-output cycle, the expert/teacher is a facilitator who provides guidance, advisory or mentorship to learners (based on learning principles) without dictating how things must be done. In learning how to become an entrepreneur or act entrepreneurially, learners get to know how to react vis-à-vis environmental uncertainties or market changes. The role of the expert/teacher is to help learners find out the best of themselves that they can use in order to adopt, adapt or resist against market challenges. Learners should be aware that there is no guarantee that repeating the same process in the same environment will automatically reproduce the same results.

Though criticised to be too complicated and difficult to apply due to high teacher-student engagement in/and the performance of many tasks related to the same target structures (mainly due to its iterative nature), the LCF has the advantage of being conveniently applied in classical teaching styles as well as modern media driven teachings. LCF can provide a teacher or course designer with a means of aligning technology with the lesson objectives, throughout the different cycles of the framework. Thus, based on her classification of teaching strategies, Laurillard (1993; 2013) classifies media into four different types from which practitioners have the chance to choose suitable media to meet a lesson's objectives.

- First, narrative media which is a non-interactive way of presenting media, such as through graphics, audio-recordings and films. Teachers can use such types of media to design their teaching, thereby providing encouragement through in-text self-assessment questions.

However, it is recommended that the teaching environment and the teaching material be conducive and attractive in the sense that students may lack interest in these types of media, as they may not incorporate the latest technology favoured by the new generations

- Second, the interactive media which represents open media that can be controlled by students and which includes hypermedia and websites. However, this type of media requires a high level of support (which also may come with additional resources- time, mentors, equipment etc.)
- Third, the adaptive or computer-based media changes its status based on users' actions as it may provide with automatic feedback (e.g. in educational games and simulation)
- Lastly, communicative media which provides the teacher and students with a medium for discussion such as online discussion forums and wikis.

In conclusion, LCF integrates and supports various teaching methods used in higher education, such as learning through acquisition (from lectures and books), learning through practice (via tasks), learning through discussion (in scenarios), and learning through discovery (on fieldtrips and through practical). It can be a good technique for educators interested in teaching about or for entrepreneurship (passive learning of theories and processes) as well as for those interested in teaching in/through entrepreneurship (active learning or learning by doing).

3. CHAPTER THREE: ENTREPRENEURSHIP MODULE DESIGN AND TEACHING: BUSINESS PLAN VERSUS NEW ACTION-ORIENTED MODULE

This chapter is designed with a particular focus on teachers and trainers, responsible people for knowledge/skills development and transfer. For the purpose of avoiding redundancy, the following terms are used interchangeably but have the same meaning:

- Teacher, trainer, educator, facilitator and moderator refer to the person in charge of transferring the knowledge and skills.
- Student and learner refer to the person receiving the knowledge and skills.
- Module and course refer to the transferrable content of knowledge and skills.

It is also important to highlight key components of both the Business Plan module and the New Action-Oriented module before entering into details of their design and teaching processes. The Business Plan was taught to the Control group and the New Action-Oriented was taught to the Treatment group.

Table 8: Checklist of the module key components and teaching methods

Business plan		**New action-oriented**	
Component	**Method**	**Component**	**Method**
Entrepreneurship and Intrapreneurship	Instructive	Entrepreneurship and Intrapreneurship	Instructive
Business idea generation and selection	Instructive; Experiential	Business Idea Generation and selection	Instructive; Experiential
Business Planning Process	Instructive	Business Model generation	Experiential
		Rapid Market Appraisal (Product/service chain assessment)	Experiential; Participatory learning and action (Exploratory/Investigative)

Source: Author's elaboration, 2019

3.1.Module design: Learning objectives

At the beginning of the training the trainer introduces the course to participants, collects their opinions and expectations and matches them with the learning objectives. For effective and successful delivery, expectations and goals of participants have to be met and this requires a mix of teaching methods. This interactive exercise between the teacher and learners stimulates the interest and participation of the recipients and the trainer familiarizes him or herself with the expectations of the audience before the training begins. It also helps the teacher to redefine or readapt the course content for the intended outcomes. For each day session, a course outline should be specified. This is to ensure that there are no false pretences and that the outline of

the package and training are clear to all participants. With the present modules, the intended learning objectives for students include:

1. To understand and explain key concepts related to entrepreneurship and intrapreneurship
2. To raise awareness of personal entrepreneurship characteristics and the ability to align them with the world of entrepreneur or intrapreneur
3. To develop key entrepreneurial values and attitudes applicable in self-employment or employment by others
4. To develop competences for applying tools used in business start-up processes.

3.2.Module design: Content

Two modules were designed: the business planning and the new action oriented. The business plan module was designed based on the course content in science departments as well as on similar courses taught in business departments at INES. It explains concepts of entrepreneurship and intrapreneurship, their importance to economic development as well as the process of business planning. Critiques against business planning as a means of teaching entrepreneurship by traditional business schools say that it tends to overemphasize quantitative and corporate techniques at the expense of more creative skills (Nshimiyimana et al., 2018). That can be corrected through entrepreneurship teaching that emphasizes imagination, creativity, and risk taking in business. In this line a new module built on action-learning approach was designed and introduced to students. It covers entrepreneurship and intrapreneurship; business model generation; and product/service chain assessment through participatory learning and action (also called Rapid Market Appraisal).

Given that science major students spend much time in developing disciplinary skills with low exposure to market environment, which may give them little room for manifestation of entrepreneurial behaviours/attitudes, the study explored how the proposed entrepreneurial module affects students' entrepreneurial-like thinking. Moreover, since students had not been subject to any of the two modules, the study tested both modules and checked the implications of each on the respondents' entrepreneurial thinking. The two modules have in common the introductory and concept explanation parts. Content and transmission approaches are also similar in these parts. The detailed teaching plan can describe more in the annexes 1 and 2.

Before and after teaching each module, five dimensions of entrepreneurial orientation (EO) were used as measurement indicators. Such dimensions are risk-taking, proactiveness, autonomy, innovativeness and competitive aggressiveness. Lumpkin and Dess (1996) define EO dimensions as follow:

- Autonomy: The independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion.
- Innovativeness: A firm's tendency to engage in, and support new ideas, novelty, experimentation, and creative process which may result in new products, services, or technological processes.
- Risk Taking: The willingness to incur heavy debt or making large resource commitments by seizing opportunities in the marketplace in the interest of high returns.
- Proactiveness: Taking initiatives by anticipating and pursuing new opportunities and by participating in emerging markets.
- Competitive Aggressiveness: A firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position to outperform industry rivals in the marketplace.

3.3.Module design: delivery approaches

Whilst the generic or business plan module is predominantly teacher-centred i.e. students passively receive information, the emphasis is on acquisition of knowledge, and teacher's role is to be primary information giver (theory/concept/process explanation and/or demonstration) and evaluator (Huba & Freed, 2000), the new module is "trainee-centred" whereby most of ideas come from participants. Students are actively learning and they have greater input into what they learn, how they learn it, and when they learn it (Ahmed & Ain, 2013). As Brown (2008) claimed, student-centred learning approach gives students ownership over their learning and helps them make necessary decisions and value judgments about the relevance of the content and the methods of teaching to their own lives and interests. With this approach the teacher acts as a facilitator/guide who helps students to achieve their goals.

Although components in the two modules were designed for a maximum length of one day-session, it is possible that some module components can take longer than one day. That depends on the learners' preliminary skills, experience, background and the speed of learning. In such

situations, trainers can adjust time allocation as they see fit depending on the target group. Apart from lecture sessions that clarify the concepts, terms and processes (where applicable), series of (practical) exercises have to take the centre stage. Time allocation for each part must be reasonable- not too short not too long.

Table 9: Example of time management plan

Type	Time
Power point presentation/ Lecture	30- 60 minutes
Individual exercises	10−20 minutes
Group exercises (between 3-5 individuals)	30−60 minutes
Open discussions	3−5 minutes
Interactive exercise/Role plays/field visits	15-120 minutes

Source: Author's elaboration, 2019

Notice: Exercises can be individualised or done in smaller groups (5 individuals maximum) formed for identifying local business opportunities or challenges. Participants identify situations in their society or environment that can be an opportunity for business development and briefly explain how it can be transferred to business. Or, trainer can give participants copies of local newspaper, can tell them a story and/or ask them to find news that can lead to potential business opportunities.

3.4.Common components for both modules

3.4.1. General Introduction

The general introduction briefly talks about concepts of entrepreneurship and employment, entrepreneurial orientation for students and the teaching plan. This is an introductory lecture series for understanding entrepreneurial dynamism in self-employment or employment by others. It is meant to help students be aware of and understand requirements of the working environment that awaits them after graduation; it raises awareness about challenges and benefits of being employed or self-employed; it highlights key interlinks between entrepreneurship and employment especially in areas of "personality types" (Holland, 1997) and "Skills for work" (ILO, 2013).

Students no matter what subject studied will find themselves in a working environment that demands both personal and functional competences. Tasks can be very or less demanding, individualized or team oriented. When dealing with entrepreneurship or intrapreneurship, one important component deals with the "Things I like to do" which predicts whether an individual prefers to be self-reliant or under guidance, whether in certain circumstances the individual has

(or not) the ability to adapt, change and lead, and how fast, etc. Under the theory of vocational choice developed by Holland (1997), most people are one or a combination of six personality types: realistic, investigative, artistic, social, enterprising and conventional. Since personality types influence the choices individuals make for the future, it therefore matters to identify the personality types and associate them with the emotional impulses that result into specific attitudes.

Table 10: Six personality types

Personality types	Characteristics
Realistic	Mechanical and athletic abilities; enjoys working outdoor, likes working with tools and machines. Prefers working with things more than idea/people
Investigative	Mathematical and scientific abilities; enjoy working alone and solve problems. Favours working with ideas or things more than with people
Artistic	Creating original work and has good imagination; enjoy working with ideas more than with things
Social	Interested in human relationships and help others with problems; like working more with people than with things
Enterprising	Have leadership and speaking abilities; interested in economics and politics and be influential, like to work with people and ideas than things
Conventional	Clerical and arithmetic ability; prefers working indoors and organize things. Enjoy working with words and numbers

Source: Holland, 1997

In the same perspective the ILO (2013) identified six skills for work built around six well-known occupations/vocations and the types of skills required for performing at work. They are people skills, manual skills, data/information skills, creative/artistic skills, verbal/communication skills, and leadership skills. When such skills are well developed along the disciplinary studies, they increase an individual's readiness for work. The following table 11 describes more.

Table 11: Skills for work

People skills	**Manual skills**	**Data /information skills**
• Help and care for others • Manage conflicts • Interview people • Be kind and understanding • Negotiate • Show patience • Be pleasant and sociable • Supervise, teach/train	• Assemble kits • Build or repair things • Work well with hands • Operate tools, machinery • Use complex equipment • Drive or operate vehicles • Inspect and maintain equipment or vehicles	• Manage money, make a budget • Record facts, classify information • Analyze data, audit and maintain records • Pay attention to details • Investigate, clarify result • Gather information • Research and write reports
Creative/artistic skills	**Verbal/communication skills**	**Leadership skills**
• Write short stories or articles	• Talk easily with others	• Make decisions

• Express yourself through poetry, music or art • Perform and act • Use computer to create presentations • Achieve high scores in games	• Express yourself clearly • Create and talk about new ideas • Be logical • Work well with others • Write clearly and concisely • Speak in public • Set up own network	• Direct work of others • Solve problems • Motivate people • Find agreement within a group • Take risk when necessary • Show self confidence • Organize/chair meetings

Source: ILO, 2013

In this introductory part, the concept of entrepreneurial orientation is briefly introduced and put in the context of entrepreneurial education. As globalization, rapid development of technology and the lower cost of travel have completely changed the nature of work, it is no longer enough to train students for a career; universities must prepare students to work in a dynamic, rapidly changing entrepreneurial and global environment (Wilson, 2008). Underscoring this helps the teacher to stress the key points that are measured when assessing students' progress in personal entrepreneurship characteristics. EO for students looks at students' attitudes or activities that reflect risk taking, autonomy, proactiveness, innovativeness and competitive aggressiveness.

3.4.2. Introduction to Entrepreneurship and Intrapreneurship

This component takes one full day of training. Participants get an outline of the day in terms of content and activities. The session begins with an inquisitive exercise that checks individual awareness about entrepreneurship and its characteristics. During this open iterative session, ideas are collected and collectively discussed in class; and uncommon terms are explained for better understanding. The activity is concluded with a summary of key entrepreneurship characteristics selected based on participants' interventions. At this particular moment the first phase of data collection regarding self-appreciation in PECs is done. Once finished, students are appealed to keep, along the teaching process, discovering more characteristics through reading, discussions... At the end of the entire training the same exercise is repeated using the same instrument of data collection. The purpose is to assess if any changes have happened in the thinking of participants compared to the initial perceptions.

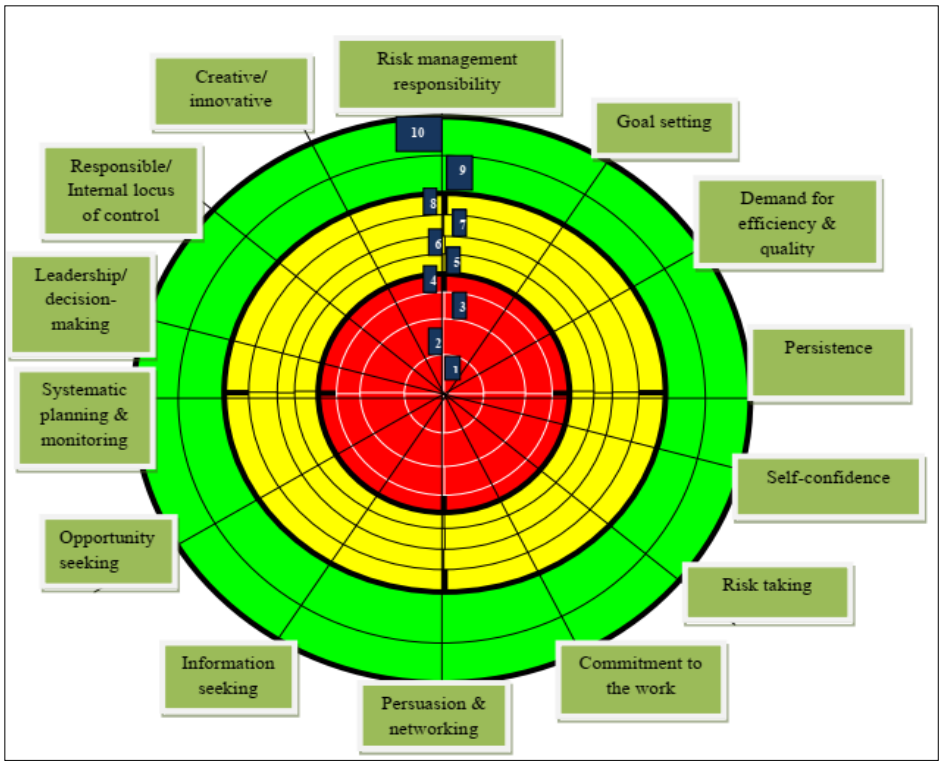
Once the first phase of data collection is finished, lecture series are organized. The teacher explains in detail- with scientific evidences from literature- the concepts and theories of entrepreneurship and intrapreneurship, PECs and Business Idea Generation (BIG). Explanation of concepts and theories can be done using power point presentations or handouts. If other tools

have to be used for explaining the concepts in a practical way, power point presentations as well as demonstrative exercises are utilised. Teachers (can) use templates in order to help learners describe their ideas in a more structured manner. This is the case for the BIG- the final session of the day.

3.4.3. Personal Entrepreneurship Characteristics (PECs)

The wheel of PECs is a visual representation of what can be considered as entrepreneurship characteristics. It captures both the personality and functional aspects of entrepreneurship characteristics. In the PEC's identification process, it is better if participants describe and rate the characteristics they think are most important for them and try to explain why they think so. It is also good to ask them when they think they can apply such characteristics in the entrepreneurship decision-making process. This helps the teacher to stimulate discussions, explore participants' levels of understanding, and their ability to identify when such characteristic can be applied.

Figure 5: Example of the wheel of Personal Entrepreneurship Characteristics



Source: Adapted from Buiza, 2012

3.4.4. Business Idea Generation and Selection

It is important to introduce to participants different techniques used in developing and assessing the best and viable business ideas. Once this in-class demonstration is over, individuals (can) do similar exercises and apply similar techniques to their business ideas. In this study, four BIGS techniques were used including Brainstorming and Mind Mapping for idea generation; Business Idea Conceptualisation (BIC) and Macro and Micro Screening (MMS) for best idea selection.

a. *Brainstorming* is the process of generating a huge number of solutions for a specific problem (idea). The emphasis is on the number of ideas rather than the quality. In its principles, participants are requested not to assess ideas but rather speak out the ideas freely without fear of criticism. Bizarre or strange ideas are accepted with open hands. The crazier the idea, the better. Brainstorming can be done both individually and in groups. The typical group comprises 6-10 people.

   Brainstorming can also be structured (following a certain order and principles) or not structured (random collection of opinions). After collection of ideas, it is recommendable to organize them according to their similarities, discuss and finally rank them in accordance to their perceived level of importance. Once such hierarchy is established, it becomes easier to know the scope and focus for the next activities.

b. *Mind Mapping* is a visual representation of hierarchical information that includes a central idea surrounded by connected branches of associated topics. It allows students to comprehend, create new ideas and build connections. It encourages participants to begin with a central idea and expand outward to more in-depth sub-topics. In principle, participants choose the main idea or topic and begin by creating an image or writing a word that represents that first main idea. From that main idea, they create branches (as many as needed) that each represents a single word that relates to the main topic. It is recommended to use different colors and images to differentiate the branches and sub-topics.

c. *Business Idea Conceptualisation:* After explaining the BIG techniques with examples, a "Business Idea Conceptualization Template" is introduced. The template contains key basic components that help an individual to figure out what s/he wants to do as a business, for whom and how. Participants have to fill in the allocated space, follow and respect instructions as indicated on each of the key points. The limited space in the template

pushes for precision and concision of ideas. Each participant fills in the form, pitches his/her idea in five minutes (two minutes for presentation and three for questions). After all have presented, groups of five persons each are formed based on close similarity of business ideas. The group chooses one idea to work on till the end of the training. Although this process of pitching is possible for smaller groups, it is recommendable for bigger groups to select few ideas randomly. The following is a template for business idea conceptualisation:

Business Idea Conceptualisation Form

Instructions: *This form is simply to provide guideline. On each question provide 2 key ideas maximum (where applicable). Use the allocated space only. However, you may include any additional details relevant to your business idea by using additional sheets. Your business idea will be used for the purpose of learning and will not be divulged to unauthorized third parties.*

Name (s):……...

Department/Option……. Student ID…..……

E-mail:……..... Telephone number:……

1. Introduction

   Describe your business idea. What product(s) or service(s) do you propose to offer?

   ……..……

   .……..

2. Need/Problem identification

   2.1 Describe the need(s) or problem(s) you identified that led you to that business idea. In other words what led you to think about the business idea you propose?

   ……

   ……

2.2 What percentage of the population do you think face the problem(s) you have identified? Is there a particular group of people affected by it or does it affect the society as a whole?

……

……

3. Solution

3.1 Clearly describe how your proposed product(s) or service(s) will address the problem(s)/ need(s) described above

……

……

3.2 What value proposition do(es) your product(s)/service(s) offer for the customer? Will it/they offer cost savings, more convenience, reliability, accessibility etc.?

……

……

4. Competition analysis

4.1 Indicate the direct (competing product or service) and indirect competition (any alternative product/service) for your product or service

……

……

4.2 Describe how your product (technology) or service is different or better than the competitors' one

……

……

4.3 What is your competitive advantage? Why will customers buy your product or service as compared to the competitor products/services?

……

……

5. Market

5.1 What is the market size that you are targeting? Are you targeting the market of the area where you live only (specify if it is a sector, district province… and specify where exactly), or the international market, or any specific country?

……

……

5.2 What market segment(s) will your product or service target? For example, are you targeting students, youth, civil servants, or any specific group?

……

……

6. Business strategy/revenue model

6.1 How much money will you need to start this business? Provide a rough breakdown of the costs

……

……

6.2 How will you sell your product or service (direct sale, distributors, internet etc.)?

……

……

6.3 How will the business generate revenue for its product(s) or service(s)? Roughly describe what price you are going to charge and what will be the profit margin? If possible, provide a three year financial projection

……

……

7. Management Team

7.1 Who will be in the management team that will turn this idea into viable business and run it? Firstly, describe your experience and expertise, and then describe the experience and expertise of one of your team members

……

……

Names:……..... Date:……

d. *Macro and micro screening of business ideas:* Such techniques rely on the fact that in the beginning of the training it is not easy to decide which business idea is the best for potential implementation. For that reason, the choice of best business idea goes through different stages and the selection follows certain principles.

- ***Stage 1: Macro screening***

This stage consists of presentation of all participants' ideas based on the business idea conceptualisation form. After the initial presentation of ideas by each participant, all ideas are discussed in class and some are rejected to remain with 5 to 10 ideas maximum. If the group is big, random selection can apply. Ideas can be rejected because they are similar or closely related, belong to the same sector, are difficult to understand (fiction) or impossible to implement (in the local context), etc. After the first elimination, groups are formed around the remaining ideas and such ideas are discussed in the next stage without entering into deep details.

- ***Stage 2: Micro screening***

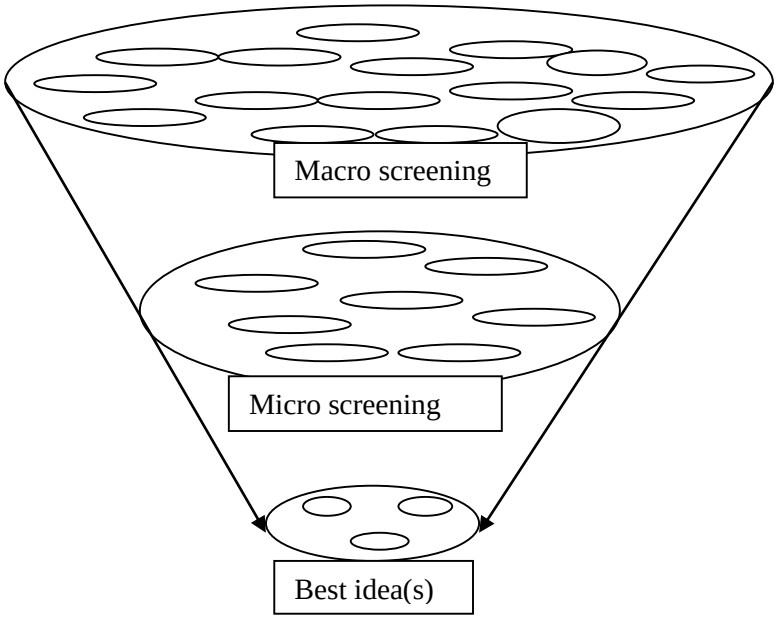
Group members discuss about opportunities and challenges in relation to political, economic, social-cultural and technological environments. A maximum of two or three ideas on each point is allowed. At this stage, it is always important to remember that group members reflect on their business ideas with limited and inaccurate data. Therefore, the moderator/teacher reminds them that although they have limited information, they can build on personal backgrounds, little experience, knowledge and skills acquired at school or through other means (home or social groups) and draw important conclusions. Once they have done that, each group is encouraged to do SWOT analysis by looking at the strengths and weaknesses of its business idea with a realistic view (two ideas maximum for each point) and finding out whether there are opportunities or challenges for implementation. Groups present their findings (5minutes for presentation + 5minutes for questions and answers) and more inputs are provided by the audience. This is done for enriching and challenging the group's scope of thinking. In this session, destructive and constructive arguments are provided. Once all groups have finished presentations, only three best ideas are selected through vote to enter the final stage.

- ***Stage 3: Best idea selection***

The final step of the business idea generation process is related to the selection of the best business idea. It is assumed that all the necessary information about the remaining business ideas has been briefly collected and that all participants contributed and challenged the group idea presenters. The next step becomes about deciding collectively which idea has the highest potential. Two factors have to be analysed including the ease of the idea's

implementation and profitability. Ease of implementation reflects the availability of competences and capacity (knowledge, skills, finance) and environmental friendliness (whether it is possible to implement it in such an area given social, cultural, economic and political-legal contexts). Profitability reflects positive return on investments (which has to be achieved at low cost). Once such observations are done, participants vote for the best business idea. This process is depicted as follows.

Figure 6: Screening and selection of business ideas



Source: Author's design, 2019

3.5.Entrepreneurship module design: Business Plan

While the common components are taught to the control and treatment groups, the following part describes the module components taught to the control group only. Depending on the target group's entrepreneurship values and competences to be developed through business planning, the emphasis and time allocated to each business plan component can vary. Below is a checklist of content delivered to students in the Business Plan module.

3.5.1. The Business Plan content checklist

Table 12**:** Business Plan module content checklist

Topic	Content
Introduction to Entrepreneurship and Intrapreneurship	• Module overview • Definition of entrepreneurship and Intrapreneurship • Personal Entrepreneurship Characteristics (PECs) • Wheel of PECs • Entrepreneurship environment
Business Idea generation and selection	• Techniques for business idea generation (Brainstorming and Mind mapping) • Screening and Selection of best viable business ideas (Macro and Micro screening) • SWOT analysis of best idea • Final decision
Business plan writing structure	• Introduction to why and how to write a business plan • Benefits of business planning • Motivational factors for writing a business plan • Business plan structure • Executive summary
Company description	• Vision and Mission statements • Company name and Legal issues • Business goals and strategies (SMART)
Industry analysis and target market	• Description of industry • Description of industry trends • Identification of opportunities and threats existing in the industry • Defining the target market (demographic, geographic, lifestyle, psychographic, purchasing patterns and buying sensitivities)
Competition analysis	• List of Competitors • Years in business • Product/service description (what they sell) • Competitors' customer profile • Pricing strategy • Advertising strategy • Why customers buy from them
Strategic position and risk assessment	• Distinguishing yourself from competitors in the following o Customer perception factors, Market segment, Market shares o Operational and/or technological advantage • Risk assessment o Market, competitive, technology, product, o execution risks, capitalization risks o SWOT analysis o What measures can be taken to avoid these risks
Marketing plan and sales strategy	• What message does the company convey to customers? • What message do customers want to hear? • What are the marketing vehicles?

	• Sales strategies • Budgeting for marketing
Operations	• How to keep track of inventory? • What equipment is needed and when? • Production plan and quality control etc. • Research and development
Management of the business	• What are human expertises required for the business? • How many people are planned to employ? • What is the structure of the organization? • Who is responsible for what? • What will be the cost of the labour force
Budgeting and financial plan	• Income statement • Cash flow projections • Balance Sheet

Source: Adapted based on Rhonda, 2010; Dornberger et al., 2015

3.5.2. Why and how to write a business plan

Notice: The structure, the summary and explanations describing the Business Plan Components presented in the following literature relied on Abram's (2010) book entitled "The successful Business Plan: Secrets and strategies", 4th edition, and Dornberger at al. (2015) entitled: "Entrepreneurship promotion at higher education institutions (HEI) and Research Centers".

In business environment, a business plan is an entrepreneur's most crucial business document. No company can expect to articulate its goals or to secure financing without a well-conceived and well-presented business plan. Without a convincing business plan, no one will seriously consider entrepreneur's business idea. Starting the process of business planning shows how to organize planning activities, clarify the business concept, and gather the data one needs. The business plan components clarify the standard sections comprising a business plan and provide detailed information on each. When starting the process of developing a business plan, one has to keep in mind that the greatest beneficiary of this project is not the banker, investor, or accountant- it's him/her. A complete, thoughtful BP is perhaps the best tool one can have to help reach long-term goals. Whether the business is large or small, a start-up or long established, developing a BP enables to:

- Make the crucial business decisions that focus activities and maximize resources
- Understand the financial aspects of the business, including cash flow and break-even requirements
- Gather crucial industry and marketing information

- Anticipate and avoid obstacles the business is likely to encounter
- Set specific goals and measurements to assess progress over time
- Expand in new and increasingly profitable directions
- Be more persuasive to funding sources.

3.5.3. Benefits of business planning

The business plan is a roadmap to success that gets you from starting (basic business concept) to your goal (healthy, successful business); it helps thorough learning of the industry and market whereby even a small amount of information makes a difference; it helps getting control of the business over both the short-term and long-term progress of the business. Apart from these benefits, a business plan provides mechanisms to enhance management in the following areas: Marketing- by developing a marketing plan based on a well-defined target market and evaluation of the industry and competition; Operations- by evaluating and establishing the procedures, labour deployment, and work flow necessary to run the business from day to day; Finances- by realistically projecting cash flow, income and expense, break-even points, and by creating channels of information to be kept fully informed of the financial picture; Long-term development- by setting specific goals and objectives, identifying milestones, devising an exit plan, if appropriate, and determining how the company will be positioned to respond to both internal and external changes.

3.5.4. Motivational factors for writing a business plan

Rhonda (2010) argues that each entrepreneur sets goals and issues of personal satisfaction can be a central element in determining long-term success. For most entrepreneurs, such goals can be summed up by four C's which reflect Control, Challenge, Creativity, and Cash.

1) **Control:** how much control an entrepreneur needs to exercise on a day-to-day basis influences how large his/her company can be. The degree of control varies depending on the size of the company and the pace of expansion one wishes to have. Involvement in every business decision or if uncomfortable delegating or sharing authority, it is better for the business to stay small, and without rapid expansion. The opposite brings less degree of control.
2) **Challenge:** if an entrepreneur is starting or expanding a business, s/he is likely to be a problem –solver and risk-taker, enjoying the task of figuring out solutions to problems or

devising new undertakings. One needs to compare the company size and the means to resist the challenges.

3) **Creativity**: entrepreneurs want to live their mark. Their companies are not only a means of making a living, but a way of creating something that bears their stamp. That's why many businesses carry their founder's name. Creativity comes in many forms- designing or making a new thing, finding new ways to make sales, handle customers, or reward employees. If an entrepreneur has a high need of creativity, he has to be certain to remain in the creative process as the company develops. For bigger companies, entrepreneurs are advised not to overpersonalise the company to allow other stakeholders to share in the creative process.
4) **Cash:** this refers to understanding how personal financial goals have an impact on the business plan. For example, if an entrepreneur needs substantial current income, s/he may need investors so that s/he has sufficient cash to carry through the lean start-up time. If it is building a very large company and accumulating substantial income or wealth quickly, s/he will need outside investors to finance such rapid development or expansion. Entrepreneurs are advised to remember that there is sometimes a trade-off between personal goals: wanting more cash means having less control.

3.5.5. Business plan components

3.5.5.1.The Executive summary

No matter how beneficial the product, how lucrative the market, or how innovative the manufacturing techniques, it is the Executive Summary alone that persuades a reader to spend the time to find out about the product, market, and techniques. Two types of executive summary can be identified: the synopsis and the narrative. In our training, the focus was put on synopsis summary.

The synopsis summary is more straightforward of the two. It simply relates, in abbreviated fashion, the conclusions of each section of the completed business plan. While it has the advantage of being relatively easy to prepare and less dependent on a talented writer; its disadvantage include that the ton tends to be rather dry. The synopsis presents the company description, statement of mission, stage of development, product and services, target market(s), marketing and sales

strategy, competitors and market distribution, competitive advantage and distinctions, management, operations, financials, long term goals, funds sought and exit strategy.

The narrative summary is more like telling the reader a story; it can convey greater drama and excitement in presenting the business. It is more relevant to businesses that break new ground either with a new product, new market, or new operational techniques that require considerable explanation. It wants to get the reader excited about the company, by taking the one or two most impressive features of the company and giving the reader an understanding of how those features will lead to business success. Its content includes the company, the concept, how to make opportunity, competitive advantage and distinctions, management team, milestones, financials.

3.5.5.2.Company description

This part conveys information such as the name, legal status, ownership, products and services, company mission and milestones achieved to date (ex. Product completion, product testing, infrastructure development, agreement reached…). Students had to use some of information contained in the Company Description Plan Preparation Form (Rhonda, 2010: 69-70). For this study check annex number 3.

3.5.5.3.Industry analysis and trends

The term industry here "consists of all companies supplying a similar product or service, other businesses closely related to that product or service, and supply and distribution systems supporting such companies." (Abram 2010: 73). In the plan, focus on:

- A description of your industry (check past and future growth of your business sector: total revenue, total units/volume, total employment, industry growth rate, GDP growth rate, rate compared to GDP (+or %)
- Trends in your industry (look at annual reports of companies engaged in similar business and see what they're doing in the way of financials. If your plan shows you doing much better than these big companies (in areas like profit margin), it will not be believable). It is important to check the effect of economic conditions on the industry and business. This helps to anticipate or plan for growth in good times and belt tightening in difficult times.
- Strategic opportunities and threats that exist in your industry in terms of technological changes, regulation or certification, supply and distribution channels, etc.

3.5.5.4.Target market

It is paramount for a business success to have thorough understanding of the customers. Knowing who the customers are helps the businesspersons to assess whether they are meeting their needs? Therefore, it is critical to define the nature and size of the market if the business is market driven. Knowing who will buy the product/service, what they feel about it, whether they think it's a luxury or commodity, the packaging, the branding etc.

It is also necessary to consider demographic and geographic descriptions of the customers and make sure four criteria are met. The target market should be definable - which means to have specific characteristics identifying what the potential customers have in common; it should be meaningful - which means the characteristics must meaningfully relate to the decision to purchase; be sizable - which means it must be large enough to profitably sustain the business; and finally reachable - which means both the definition and size must lead to affordable and effective ways to market to potential customers.

In identifying and describing the target market, one should be able to describe demographic, geographic, lifestyle (consumer or business-style for businesses), psychographic patterns (consumer/business), purchasing patterns and buying sensitivities. The description of the target market should also show something related to the market size and the trends likely to affect customer behaviour in the next few months/years. Examples of demographic, lifestyle and psychographic description can be found in the annex 4.

3.5.5.5.The competition

It might be illusive to state that one's business concept has no competition. Those currently operating a company are aware of the many competitors for a customer's money. But many people new to business –excited about their concept and motivated by a perceived opening in the market- tend to underestimate the actual extent of competition and fail to properly assess the impact of that competition on their business. Never state "We have no competition" because that may discredit the reputation of business plan by a knowledgeable investor. The latter may think that no thorough assessment of the market has been done or there is no market for the concept. Therefore, business plan developers have to evaluate their competition, competitive position and factors affecting their ability to compete.

In competition analysis it is important to make a few reasonable predictions of what the competition will look like in the future. New competitors enter markets all the time, and sometimes current competitors drop out. Therefore, in preparing the competitive analysis section, focus should be on identifying who the major competitors are; on what basis you/they compete; how you compare; potential future competitors, barriers to entry for new competitors (Abram 2010). In other terms, business planners must think carefully on their offensive as well as defensive market competitive strategies.

3.5.5.6.Strategic position and Risk assessment

- *Strategic position*

Abram's (2010) writes that a strategic position defines what you do and you don't do….Just as well-written mission statement guides your company's values and long-term vision, a well-delineated strategic position influences almost every aspect of your business such as the development of your products or services, marketing, operations, and choice of location. In that sense, the strategic position should be where the entrepreneur finds s/he is stronger to align the company's strength and interests to industry trends and developments; market changes and opportunities to changes and opportunities brought through new technologies. In other words, where there is a possibility to adjust and adapt company strategies in line with the changes in the market environment.

As strategic position is much more a concern of young companies, defining a clear strategic position assists them in figuring out how to allocate those resources. In strategising companies try to create a meaningful place for themselves (a position) in the market by distinguishing themselves from competitors in areas including: Customer perception factors (price, quality, features, customer service…); Market segment (geographic location, age, income, interests, family size of consumer served, customers' specialized need); Market share (establishing and commanding a dominant portion of the total customer base that it becomes difficult for other to compete); Operational and/or technological advantage (gain significant competitive advantages through instituting better internal procedures, operations, or technology, giving substantial benefits- such as higher profit margins- over the competition); proprietary products, technology, abilities, or relations (develop or secure exclusive assets that will be difficult or impossible for competitors to replicate- ex. patents, processes, or copy rights); sales channels (differentiate one's company by the manner in which it reaches and sells to customers), etc.

- *Risk assessment*

Risk-taking is one among key characteristics of entrepreneurs. This means every business involves risks whether high or low. However, important is not to know that they exist, what matters are what kinds of risk. Those include market risks (not responding to product/services- may be no real market need or no market readiness), competitive risks (new market entries or repositioning by existing companies), technology risks (incompatibility between technology, product design and engineering), product risks (won't materialise, won't finished on time or won't work as promised), execution risks (ineffective management of the roll-out and growth of company due to incapable managers) or capitalization risks (underestimation or overestimation of cost and/or income). For balancing risks and opportunities, the company has to do SWOT (Strength, Weaknesses, Opportunities and Threats) analysis exercise that quickly helps sizing up the company's position.

3.5.5.7.Marketing plan and sales strategy

Important in this component is to define how customers will be aware of the product or service; the message the company is trying to convey to customers about the product, service or company; specific methods to use to deliver and reinforce the message and; how to secure actual sales. The company's message to customers will involve the 4P's: Product (tangible aspect of the product/service), Price (cost advantage), Place (location's convenience and decor), and promotion (amount and nature of the marketing activities). The message involving 4P's has to fit customers want- the 5F's: Functions (product/service meet the concrete needs), Finances (how the purchase affect their overall financial situation- not only product price but also savings and increased productivity), Freedom (convenience in product/service purchase and use, time saving), Feelings (self-feeling, self-image), and Future (relations with product and company over time, support and service availability, impact on customer life in future, increase of sense of security or not?) (Rhonda, 2010, p.134-135).

Some of the marketing vehicles include Brochures, company website, print media, broadcast media, online advertising, advertising specialties (calendars, caps, gifts…), direct mail, email mailings, public relations, sampling and informal marketing/ networking.

Every marketing activity in profit driven organization is done for increasing sales. Therefore, sales structures must be established and refer to how the company achieves actual customer orders.

Two activities of sales can be identified depending on whether they are done on the business premises or by calling on customers at their home. The sales force is inside sales personnel - employees who remain on the company's premises to secure sales, and outside sales personnel - salespeople who go to customer's locations to solicit orders. They can proceed by on-site-sales, mail order sales, telephone sales, online sales, off-site sales (customer's site of business), and third-party sales.

The annex number 5 describes marketing vehicles and how to prepare a monthly marketing budget based on them (this can be adjusted as it fits to quarterly, yearly plan etc.).

3.5.5.8.Operations

This component explains the day-to-day functions of the company. This is where the theory is translated into practice. Information on how to keep track of inventory, or what equipment is needed and when it must be replaced should be discussed here. In describing operation, the business planner has to think about facilities, location, lease, improvements, and utilities/maintenance. If it is a manufacturing business, s/he has to assess the production plan especially labour/variable labour (kind of labour versus the number of people needed to produce the product/service), capacity, quality control for maintaining same standards, equipment and furniture. After the product is available, reliable distribution plan needs to be developed as well. It has to determine whether the product will be distributed through a wholesaler, middle-man or direct to the final consumer.

In operations, the entrepreneur should not forget the ongoing competition which keeps introducing new products/services or new processes in the market. Therefore, s/he should not forget research and development because he must strive to be on top of new developments that are likely to affect his/her business. Equally important is the financial control which has to be promptly and accurately handled. Invoices should be sent quickly, and system of regular follow-ups should be established for delinquent accounts (Abram, 2010). At this point it is also important to calculate start-up costs (check annex 6).

3.5.5.9.Technology plan

There is no business without technology. Technology has been and is central to running a business and it is important to identify the type of technology needed and how it will be used. At the start-up phase of the business, it may not be needed to figure out each technology issues in details, but

a realistic sense of costs should be done and put together with the financial statements. Technology is used in many areas of the business including accounting, taxes and finances; database management such as customers, product, supplier, or inventory; personnel/ human resource management; internet marketing/website/email etc. When choosing the technology to utilise, key issues include: Functions; Ease-of-use; Cost; Security; ability to be upgraded and expanded; integration with existing data, technology, systems etc. (Abram, 2010). In budgeting for the technology, the following worksheet can be used to specify costs of the technology needs.

Table 13: Budgeting for technology needs

Technology	Year 1 ($)	Year 2 ($)	Technology	Year 1 ($)	Year 2 ($)
Software			**Hardware**		
Accounting			Desktop computers		
Customer relationship management			Portable computers		
Human resource management			Servers		
Inventory management			Backup systems		
Office suite			Printers		
Custom software			Networking		
Other			Peripherals		
			Other		
Telecommunications			**Consulting personnel**		
Telephone system			System design/maintenance		
Mobile phone/pagers			Tech support/help desk		
Fax machines			Other		
Internet access					
Other					
TOTAL			TOTAL		

Source: Rhonda, 2010, p.185

3.5.5.10. Management and organization

When talking about an organization, it means talking about the human being who are the heart of every business. In every organization the quality of the people determines the success of business. Many managers know that the experience, skills, and personalities of the management team have a greater impact on the long-term fortunes of a company than the product or service provided. In the management component of the business plan, developers have to describe the most important people to the company's future, the people determining the strategies to pursue or who make the final decisions, middle managers as well as simple employees' responsibilities etc. Expressed

otherwise, there has to be an organisational flow chart describing the formal structure. The flow chart facilitates to evaluate how authority is distributed, decisions are made in reality and reporting relationships to large extent. Although in bigger organizations each of the above tasks has a responsible person, in smaller organizations, the tasks are assigned or shared by many people. Therefore, when evaluating the management team, it is necessary to include (if necessary) the following positions: key employees/principals (top decision makers, key production and technology personnel); board of directors; advisory committee; consultants and other specialists; and key management personnel to be added (Rhonda, 2010).

Also, describe how compensation and incentives will be managed because they have monetary implications. Investors often want to know financial stake top management has in the company. Some of the incentives that can be offered include salary, bonuses, commissions, profit sharing etc. Finally, the management plan has to clearly show the management style. This reflects at least five important elements such as clear policy; communication; employee recognition; employee's ability to affect change and fairness.

Table 14: Evaluation of key employees' attributes, compensation and incentives

Job position	Describe attributes of the top managers					Compensation + incentives ($)		
President/ CEO	Experience	Successes	Education	Strength	Areas of weakness	Salary	Bonus	Other incentives
COO								
CFO								
MD/SD								
PM								
HRD								
CTO/TD								
Others								

Source: Adapted from Rhonda, 2010, p.192-195

Notice: CEO: Chief Executive Officer, COO: Chief Operating Officer, CFO: Chief Financial Officer, MD/SD: Marketing/Sales Director, PM: Production Manager, HRD: Human Resource Director, CTO/TD: Chief Technology Officer/Technical Director.

3.5.5.11. Community involvement and Social responsibility

As businesses look for good health (profitability, positioning, market share etc), stakeholders look also for benefiting from the organization (material or social benefits). This therefore means that as individuals have responsibilities to their communities, companies likewise have responsibilities and obligations to society at large. Companies are encouraged to being socially responsible as

part of the overall health of the company. Mutual and reciprocal treatments profit everyone involved with the organization. That said, "businesses that act with integrity and honesty are more likely to have their employees act with integrity and honesty towards the company and their fellow workers. Being a good corporate citizen makes it likely that your company will get in trouble with regulatory agencies, taxing authorities, or face lawsuits or fines." (Rhonda, 2010:211).

For the purpose of corporate responsibility, companies have to develop policies that make good corporate citizens. That implies policies related to obeying the law, acting ethically, and being honest and responsible in all your dealings; treating employees fairly and with respect, compensating employees fairly, and considering the well-being of employees as part of decision making; being honest and fair to customers and suppliers, and in advertising and marketing; being cognizant of the impact company's actions have on the environment; and being involved in the community and concerned about the well-being of others (Ibid).

3.5.5.12. Development, Milestones and Exit plan

Readers of the business plan are interested to know how the business will look like in short or long-term. In that planning horizon, they want to see how the company establishes markets-milestones- to keep it on track, something that can be achieved by developing specific objectives. With such objectives, the company has signposts to measure progress along the way. On this note, the entrepreneur needs to consider kinds of strategies that will take the company from its present situation towards the long-term goal.

In relation to milestones achieved, delineating the milestones achieved to date shows the level of commitment a company has made to the new business. For a start-up company which might not have a history, this is not applicable. However, for future milestones, the company has to elaborate a list of expected accomplishment in the first, second or fifth year. This is informative to potential investors who want to know how the company is making sufficient progress towards its goal.

With regard to the exit plan, when banks or investors lend money, they expect to get their money back and make a profit through paying them out of income, plus interest. If the business involves many partners, a clear exit strategy needs to be in place to reduce the friction that can come from having unspoken exit assumptions. Attracting investors to get into an investment is one thing but showing them how they will get out is another thing.

3.5.5.13. The Financials

Numbers reflect decisions made by the entrepreneur. Knowing that every business decision leads to numbers and, taken together, these numbers form the basis of the financial forms; careful planning becomes the result. The business plan developer has to anticipate that costs will go up; interest rates will go up; it will take longer than planned for construction, etc. it can be possible that everything costs more and takes longer than planned, and things go wrong in the end. It is advisable to make realistic assumptions which also result into realistic predictions. In case the individual/company lacks expertise, the financials can be done by an external accountant or consulting film.

The financial projections of any business plan should be well written, sufficiently documented, and concise. Financial projections must tie into and be consistent with the narrative sections of the business plan; must tie in with historical numbers; should be prepared with specific reader or audience in mind (lender or investor); should use charts and graphs to summarize key financial information, highlight the figure and keep the reader interested; all financial statements should be prepared on accrual basis (report sales when the sale is made or an item purchased), rather than on cash basis (actually receive or pay the money).

Financial assumptions, like the projections, must be reasonable, thoughtful, and defendable in each section: sales, cost of sales (material cost, direct labour, utilities, transportation, and overhead expenses of a manufacturing facility), Research and development, Marketing expense, Taxes etc.

For a checklist of financial statements, check Annexes 7: Income statement, Annex 8: Cash flow statement and, Annex 9: Balance sheet statement.

3.6.Entrepreneurship module design: Action-Oriented

This entrepreneurship module is experiential and action oriented. It is trainee-centred and utilises tools meant to uncover and stimulate personal awareness, creativity, proactivity, desire for autonomy, teamwork, organizational and decision-making processes. In this module students are trained in a series of knowledge and skills transmission techniques that stimulate and encourage them to apply the tools in an environment of doing and creating. The approaches allow them to learn from their experiences acquired through an iterative, reflective and experimental fashion. Tools provided can apply to a single market analysis or a value chain (product or service). This choice is motivated by the fact that graduates from targeted departments are likely to venture or

get employed in sectors that require good understanding of market linkages; they need to understand and evaluate product/service value additions from initial to final stages from producer to consumer gates; they are likely to face unemployment or employment queues (long waiting list) after graduation which can push them to venture into the unknown (where the need to get prepared before it happens).

The action-oriented entrepreneurship module covers and combines three major concepts: entrepreneurship and intrapreneurship, business idea and business model generation, and rapid market appraisal.

3.6.1. Entrepreneurship and intrapreneurship

This is an introductory lecture series for understanding entrepreneurial dynamism in self-employment or employment by others (as explained earlier).

3.6.2. Business idea and business model generation

This is a critical and experiential approach for understanding product and market complexities; applying creative thinking to find out the right value to customers. Under this component the teacher helps participants to understand the link between concepts of business idea (earlier described) and business model. The business model (also called a business design) is the instrument by which a business intends to generate revenue and profits. It is a summary of how a company means to serve its employees and customers and involves both strategy (what a business intends to do) as well as an implementation (how the business will carry out its plans) (Debelak, 2006). A business model describes the rationale of how an organization creates, delivers, and captures value (Osterwalder & Pigneur, 2010). It is argued that no single definition of business model has really emerged. The best way to get the definition is to look at why people, particularly banks and investors, often mention business models. This is because it is easier to evaluate a business' potential with a business model than a business plan. Most people can't articulate clearly what they feel is the business model, and often they just say they don't like when they see something in a business concept that they do not agree with (Debelak, 2006).

3.6.3. Success factors for a business model

Students should keep in mind that the purpose of the business model for a banker or investor is a quick way to evaluate a business. People developing a business model concept should apply the same reasoning – they need a quick and easy way to evaluate their concept to see if it will work, or to see how it can be modified in order for it to succeed (Ibid). Therefore, the following factors need to be well checked.

Table 15: Factor analysis for a successful business model

Factor	Favourable condition
1. Acquire high value customers	Without spending a lot of money
2. Offer significant value to customers	Having a significant competitive advantage
3. Deliver product or service with high margins	High quality and few opportunities for error
4. Provide for customer satisfaction	Offer service and training, if needed, provided by someone else
5. Maintaining market position	Market position is protected, or a steady stream of new products or services can be maintained
6. Funding the business	Investments are reasonable given the market size and risks, both for start-up cost and for market maintenance.

Source: Don Debelak, 2006

3.6.4. Evaluating the success factors for a business model

When evaluating whether a company has a good business model or not three main factors are checked. They refer to GEL factors which mean Great Customers (having Great customers), Easy Sales (sales are relatively easy to make), and Long-Life (the business will have a long life) (Debelak, 2006). When deciding on the potential for success of a business model, six elements embedded in the GEL factors should be favourable. A business will make a lot of money if it possesses the three elements. To determine whether a business has these three points, it is important to evaluate customers, products, distribution networks, technical support, new product development, and production. Once entrepreneurs fine-tune their business so it delivers all the GEL factors, they will be able to write a great business plan.

Table 16: Evaluating the Business model: GEL Factors checklist

Factor	What to consider	Indicators	Grading the factors
Great customers	Characteristics	Number	High
		Ease of finding	Easy
		Spending patterns	Prolific
	Value to you	$ value of sale	High
		Repeat sales	Many
		Ongoing sales support	Low
Easy sales	Value to customer	How important	Important
		Competitive advantage	High
		Price/value relationship	Low
	Customer acquisition cost	Entry point	Many
		Sales support required	Little
		Promotional activities	Low
Long life	Profit per sale	Margins	High
		Up-selling and cross-selling	Much
		Ongoing product costs	Low
	Investment required	To enter business	Low
		To keep market share	Low
		To stay on the cutting low edge	Low

Source: Don Debelak, 2006

The purpose of the checklist is to help entrepreneurs create a winning strategy for their firms and avoid negative consequences in the future. If the entrepreneurs grade the model too high, it can hurt the business in the long run. Therefore, they should objectively evaluate each point on the list by using “Excellent’, ’average” and “poor” to rate the model. For any of the key determinants in the business model evaluation in which the model rates a grade of ‘’average’’ or ‘’poor’’, they have to consider compensating tactics.

3.6.5. Business model canvas

This section introduces participants to the Business Model Canvas developed by Osterwalder et al. (2010) for developing individual and group ideas. Transmission of knowledge and skills takes place through power point presentations that explain the canvas, its components or blocs and the

interconnection between blocs. There are subsequent sequences of explanations along the process of the business model development. As participants develop the ideas, simultaneous coaching and mentorship activities happen. This group-centred assistance is meant to help members streamline their logic.

The tool concept is simple, relevant, and intuitively understandable while not oversimplifying the complexities of how enterprises function. The canvas has nine basic building blocks that show the logic of how a company intends to make money; it covers the four main areas of a business such as customers, offer, infrastructure, and financial viability. It is qualified as a blueprint for a strategy to be implemented through organizational structures, processes, and systems (Dornberger et al., 2015).

As the survival of any company relies on how to create value for customers and how to build strong customer relationships in order to capture value from customers in return (Harris, 2013), a good start in the implementation of the business model canvas begins with a thorough understanding of customer segments and value proposition. A customer value proposition is a description of the experiences a target user will realize upon purchase and use of a product (Hudadoff, 2009). The "Value Proposition Canvas" (see annex 10) is the tool that provides clear details for that purpose (Osterwalder et al., 2014).

3.6.5.1.Value proposition canvas

This tool is used to help or ensure that a product or service is positioned around what the customer values and needs or, put differently, to create a fit between the product/service and market. The tool looks at two segments including customer segment/customer profile and value proposition and can be used when there is need to refine an existing product or service offering or where a new offering is being developed from scratch.

i. Customer (segment) profile

The customer (segment) profile describes a specific customer segment in your business model in a more structured and detailed way. It breaks the customer down into its jobs (what customers are trying to get done in their work and in their lives, as expressed in their own words), pains (bad outcomes, risks, and obstacles related to customer jobs), and gains (outcomes customers want to achieve or the concrete benefits they are seeking) (Osterwalder et al., 2014). In describing the

jobs, pains, and gains, the degree of importance has to be considered in order to leave out the less important.

In further breaking down components, jobs describe the things your customers are trying to get done in their work or in their life such as the tasks they are trying to perform and complete, the problems they are trying to solve, or the needs they are trying to satisfy. It is recommended to make sure customer's perspective when investigating jobs are taken seriously as what the investigator thinks is important from his/her perspective might not be a job that customers are actually trying to get done. Jobs can be divided into: Functional jobs- perform or complete a specific task or solve a specific problem (eat healthy as a consumer, write a report, or help clients as a professional…); Social jobs- want to look good or gain power or status (look trendy as a consumer, be perceived as competent as a professional…); Personal/emotional jobs- seek a specific motional state, such as feeling good or secure (seeking peace of mind regarding one's investments as a consumer, achieving the feeling of job security at one's workplace…) (Osterwalder et al., 2014, p.12).

With regard to customer pains, they "describe anything that annoys your customer before, during, and after trying to get a job done or simply prevents them from getting a job done. Pains also describe risks, that is, potential bad outcomes, related to getting a job done badly or not at all" (Osterwalder et al., 2014, p.14). Therefore, pains can be categorized into undesired outcomes, problems, and characteristics or into functional, social, emotional, or ancillary. Obstacles can also become pains as they represent things that prevent customers from even getting started with a job or that slow them down.

On the side of gains, they describe the outcomes and benefits your customers want. Some gains are required (without them a solution wouldn't work), expected (relatively basic gains that we expect from a solution), or desired by customers (go beyond what we expect from a solution but would love to have if we could), and some would surprise them. Gains include functional utility, social gains, positive emotions, and cost savings (Osterwalder et al., 2014).

ii. Value Map

The value map describes is a set of what you offer or a composition of various types of products and services, pain relievers and gain creators. Products and services represent what the customers can see in the shop window (metaphorically speaking). Value map enumerates all the products

and services the value proposition builds on for helping the customers to complete either functional, social, or emotional jobs or helping them to satisfy basic needs. Such types of product/service can be physical/tangible goods (manufactured products); intangible products (copyrights) or services (after-sales assistance); digital products (music downloads) or services (online recommendations); financial Products (investment funds and insurances) or services (financing of a purchase) (Osterwalder et al., 2014). While it makes sense to enumerate all products or services, it is relevant to keep those essential to the value proposition.

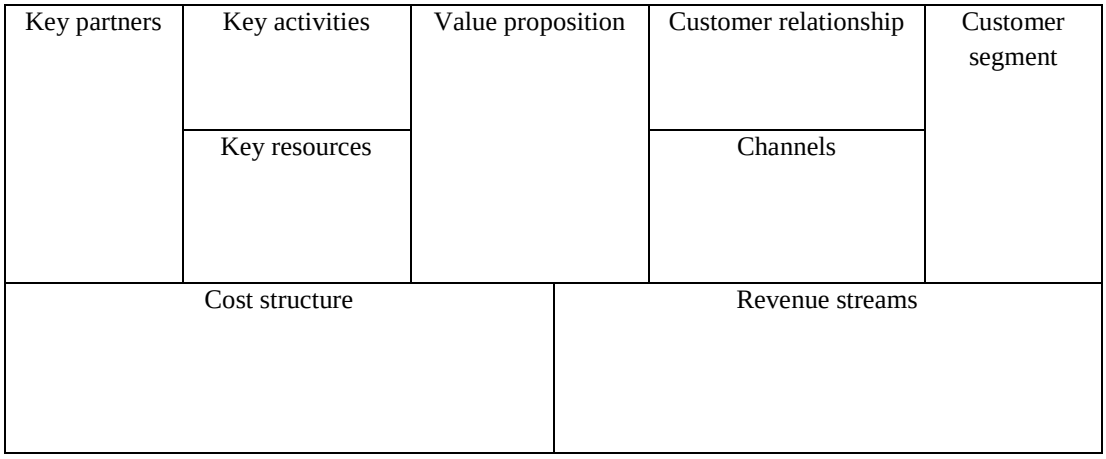
For pain relievers, entrepreneurs have to describe how exactly their products and services alleviate specific customer pains. Pain relievers explicitly outline how entrepreneurs intend to eliminate or reduce some of the things that annoy their customers before, during, or after they are trying to complete a job or that prevent them from doing so. In this sense, few and extreme pains should be the focus. Not every pain needs a pain reliever. Gain creators on their side describe how the products and services create customer gains (outcomes and benefits that a customer expects, desires, or would be surprised by, including functional utility, social gains, positive emotions, and cost savings). Gain creators also don't need to create a gain for every gain identified in customer profile (Osterwalder et al., 2014).

Once the customer profile and value map are done, it is necessary to check whether there is a perfect fit. Although the company can do whatever it finds useful and relevant to satisfy customers, it has to remember that they are the final decision-makers. Therefore, this implies the company has to always strive for "fit" as it is hard to find and maintain (ibid).

3.6.5.2.Business model building blocs

The business model canvas by Osterwalder et al. (2010) comprises nine building blocks (as depicted in the following chart). Under each block, there are key questions that need to be answered which must fall coherent with the customer profile and value proposition that we already discussed above.

Figure 7: Business model canvas



Source: Osterwalder et al., 2010

The business model canvas by Osterwalder et al. (2010) comprises 9 blocks including: Customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partners and cost structure. Apart from the customer segments and value proposition discussed above under value proposition canvas, other blocks are described here below.

Channels: The business model development should describe channels that will be used in order to move products/service from the producer/seller to the consumer. Therefore, some clarifications have to be made including: Channels through which customer segments want to be reached, how they are reach now, how the channels are integrated, which ones work best and which ones are most cost-efficient and how such channels are being/will be integrated with customer routines.

Customer Relationships: Clarifications have also to be made with regard to what type of relationship does each of the customer segments expect the company to establish and maintain with them, which ones have been established already, how they are integrated with the rest of company's business model and how costly they are.

Revenue Streams: description of revenue streams discusses type of value customers are really willing to pay for, what they currently pay for and how they are currently paying, how they would prefer to pay, and how much does each Revenue Stream contribute to overall revenues.

Key Resources: this component refers to the description of key resources (tangible and intangible) that the value propositions require, the company's distribution channels, resources for building and maintaining customer relationships or for revenue streams etc.

Key Activities: in this component there should be a description of the key activities that the value propositions require for being realized, types of activities to be performed regarding distribution channels, customer relationships, or revenue streams.

Key Partners: there is no business without partners but not all partners are important. Therefore, this component describes key partners for the company, key suppliers, kinds of key resources the company is/will be acquiring from partners, and key activities each of the partners perform.

Cost Structure: the costing section considers most important costs inherent in the business model (investments, human resources, technologies, etc.), identifies key resources and activities that are most expensive.

3.6.6. Rapid Market Appraisal (RMA)

This is an exploratory and experiential approach applying an iterative and interactive research methodology to better understand complex market systems in a short time, follow the commodity chain, have a closer look at the links of the chain (stakeholders) and the interlinks (market mechanisms) (Joss et al., 2002). Benefits of an interactive method include a two-way flow of information (interviewer versus interviewee) and direct observation. An iterative approach stresses open questions, allows new information to emerge through probing, data collection and analysis follow each other repeatedly, and can exclude irrelevant information just on the spot. Concerning the accuracy of information, data is analysed for relevance at the time of collection whereas verification of information occurs in the field from alternative sources ("triangulation"). Given the range of data collection tools, RMA does not limit itself to obtaining information only through formal tools; rather, it allows the person in the field to get information in the way he believes it best (Joss et al., 2002).

RMA grew out of a frustration with lengthy, costly and intensive formal surveys in developing countries that rarely generated any timely or sensible analysis. It is a further development of Participatory Rural Appraisal (PRA) also known as Participatory Learning and Action (PLA) method. PRA and RMA apply a systems approach. On one side of PRA as part of Farming

Systems Research (FSR), the farmer is the focus. On the other side of RMA as part of Market Systems Research (MSR) the customer is, according to Fleming (1990), viewed as the first and last point of contact for intervention design (Joss et al., 2002). In reality a perfect understanding of the market should collect and confront information from both sides- farmer/producer and customer/consumer.

In marketing research understanding the market plays an important role in how one designs the product and makes it accessible to customers. In the marketing plan one defines how customers become aware of the product or service, the message conveyed to customers about the product, service or company, specific methods used to deliver and reinforce the message and how to secure actual sales. The company message to customers covers at least 4P's (Product, Price, Place, Promotion) which have to fit with customers wants- the 5F's (Functions, Finances, Freedom, Feelings, and Future) (Rhonda, 2010). RMA collects such information in a timely shorter period.

3.6.7. Rapid Market Toolkits

RMA can cover everything in the research. However, attention should always be on the following three main points: 1) The Client first: It is the client who can best describe higher expectations of a product. Therefore, the reasoning and the question "how to create the clients' satisfaction" must orient always on the client. 2) Insiders are the experts: RMA recognises the clients and the intermediaries as the experts in the market concerned. Their knowledge and experience are sought and considered important. The outsiders (e.g. the RMA team) see themselves as students, not as experts. 3) Optimal ignorance: This means that only this much information is sought, which is required for a decision. RMA tools that can be utilised include: Semi-structured interviews; Market map and Market path (Joss et al., 2002; Wandschneider et al., 2012).

3.6.7.1.Semi-structured interviews

In this process, a grid of questions for interviews should be prepared prior to the appraisal. Rigid questionnaires (multiple choices) are discouraged in favour of so called semi-structured interviews. The advantage is that the questionnaire contains the main aspects of the investigation (key questions), often illustrated in order to facilitate orientation (an icon is understood more quickly than text) to the interviewers. Such a grid should not be used as rigid questionnaire but rather as a checklist in order to ensure that an important aspect is not forgotten. It is advised the

grid remains in the pocket or bag of the interviewer in order to create an informal and relaxed atmosphere with the interviewed person (Joss et al., 2002).

Table 17: Interview guide checklist

RMA: Product Objective: Producers get higher profit			
A	Product	• From where? Producers? • Varieties? Quantities, volumes? • Quality?	• Processing? Packing? • Storage? • Substitution?
B	Price	• Seasonality? Over years? Trends? • What price where?	• Elasticity? • Production costs/ farm gate price
C	Place	• Marketing chain and prices? • Consumers, market potential? • Export potential? Market shares?	• Actors? • Transport? • Customs?
D	Promotion	• Packing, labelling? • Marketing groups?	• Advertisement? • Other incentives (discounts)?
E	Potential	• Possible interventions? • Investment?	• Constraints?

Source: Joss et al., 2002

It has to be remembered that it is up to the researcher to determine the type, quantity and quality of data needed from which category of the target group, by which means (data collection instrument) and for how long (duration of the data collection). For individual face to face interviews, it is recommended not to go beyond 45min while the telephone interview should be between 20 to 30 minutes maximum. This time allocation can vary based on the data collection techniques used: group discussion or observation (participatory or not). Taking banana farming as an illustrative example of a market sector, the following checklist can apply to both farmers and producers along the banana value chain. The collected data (not all) is used in the market mapping and market path tools in order to facilitate the visual representation of the product or market chain.

Table 18**:** Question Checklist – Farmers/Producers

1. Production	**2. Post-harvest and marketing**
a. Total cultivated areas across different farming household types or region b. Cultivated areas for the commodity studied per type of farming household/ region	a. Post-harvest practices and technologies at farm level (drying, cleaning, sorting, storage, etc) b. Share of production typically sold in the market across different types of farming household or regions c. Seasonality in marketing and underlying reasons

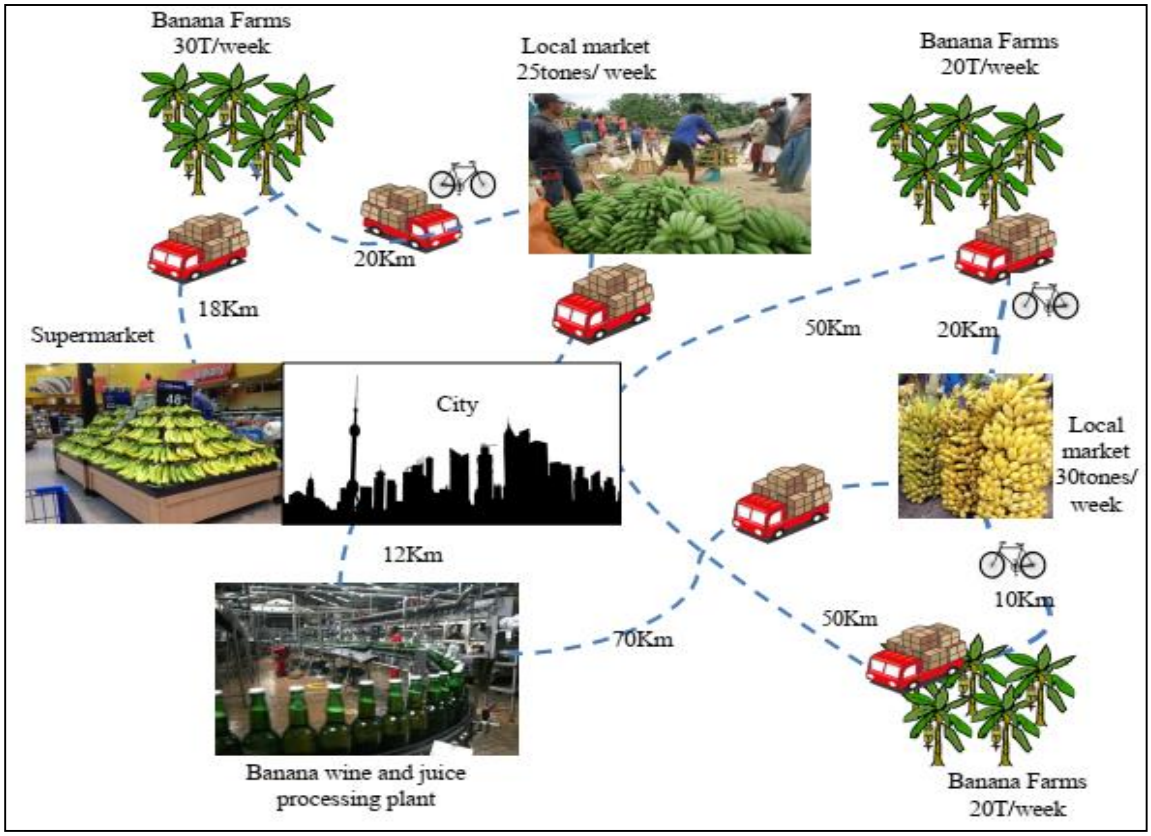
c. Production technologies and practices (e.g. input use) across different types of farming household/ region d. Typical production volumes across different types of farming household e. Seasonality in production f. Gender division of labour in production (if applicable)	d. Buyers (neighbors, collectors, assembly traders, wholesalers, processors, retailers, etc) and their relative importance (low, medium, high) e. Places of sale (farm-gate, village market, commune market, district market) and their relative importance (low, medium, high) f. Advantages and disadvantages of different markets and buyers g. Gender division of labour in post-harvest and marketing activities (if applicable)
3. Production and demand trends	**4. Prices**
a. Production trends (say over the past 3 years) and key factors behind these trends. b. Demand trends (say over the past 3 years) and key factors behind these trends. c. Major changes in demand (e.g. with regards to variety, quality, etc) d. Expectations regarding future production and demand trends (say over the next 3 years	a. Current selling prices at different locations (farm-gate, village markets, wholesalers, retailers, etc) b. Influence of produce quality (variety, moisture content, cleanliness, grades, etc) on prices c. Degree of price volatility within seasons d. Degree of price variations across seasons e. Price trends (say over the past 3 years) and key factors behind price trends f. Perception of future price trends (say over the next 3 years) and key driving factors
5. Transactions	**6. Access to services**
a. Selling arrangements (cash or barter basis, prompt or delayed payment, etc) b. Bargaining position vis-à-vis buyers c. Horizontal coordination/cooperation between producers (individual versus group sales) d. Buyer requirements (product quality, regularity of supply, volumes, place of delivery, etc) e. Embedded service provision by buyers (market information, credit, inputs, technical assistance, contracts, etc)	a. Input supply (sources, quality and affordability of inputs, problems, etc) b. Market information (sources, reliability, problems, etc) c. Technical advice on production, post-harvest and marketing (sources, reliability, problems, etc) d. Processing (availability, problems, etc) e. Storage (availability, cost, problems, etc) f. Transport (availability, cost, problems, etc) g. Finance (sources, cost, problems, etc) h. Other services
7. Policies and regulations	**8. Constraints and opportunities**
Perception of key policies and regulations, and their impact on production and marketing of the commodity under study	a. Key constraints to production of the commodity under study. b. Key constraints to marketing of the commodity under study. c. Key opportunities in the production and marketing of the commodity under study. d. Proposed solutions to address constraints and enable access to opportunities.

Source: Author's elaboration based on Joss et al., (2002) & Wandschneider et al. (2012)

3.6.7.2.Market mapping

This is considered as one of the most common tools in Participatory Learning and Action (PLA). It helps viewers to quickly identify available resources in the area. Often not the resulting map itself but the process of drawing is illustrative. The visualisation is attractive and provokes debates; information is immediately visible and can be challenged (Joss et al., 2002).

Figure 8: Example of banana market mapping



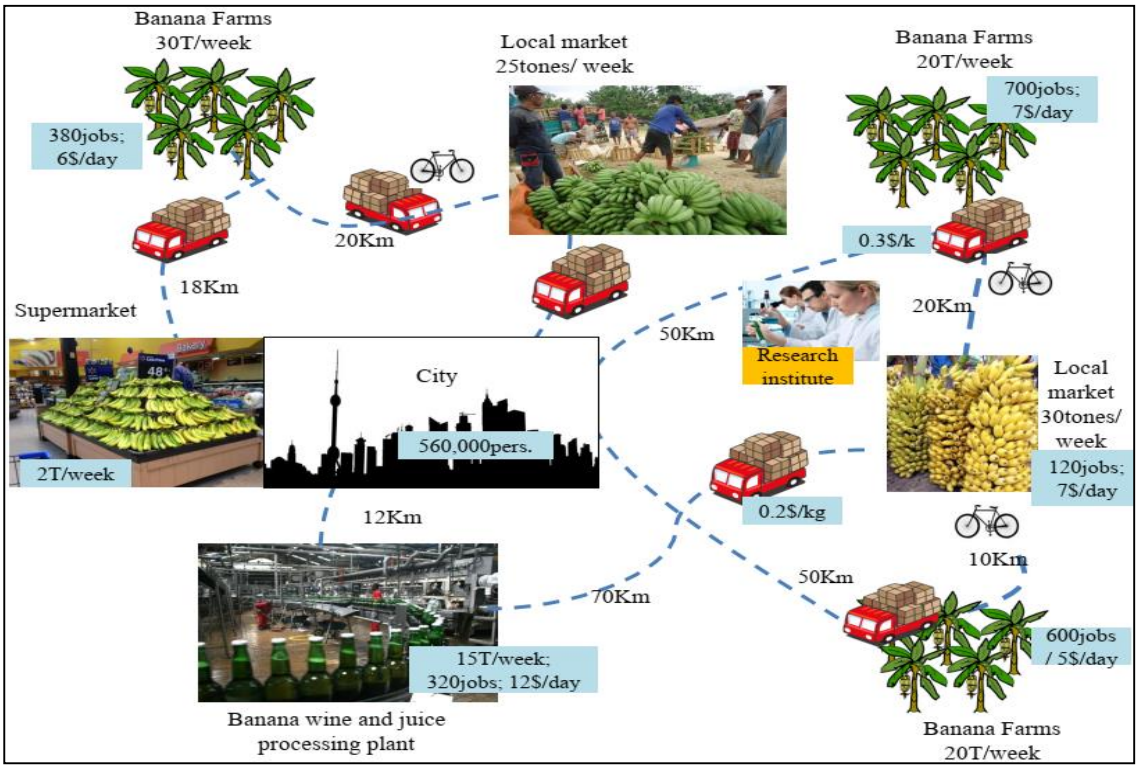
Source: Author's design, 2019

In a RMA, the markets and not the resources are usually the centre of interest. Such maps might include: the production sites, various types of markets (from assembly market to wholesale market), their location, distances, flow of products, trade volume etc. A map could also show the absorption capacity of the markets (number of clients, categories of clients, purchasing power) (Wandschneider et al., 2012).

3.6.7.3.Market Path

Market path builds on the market map to provide more information that help to visualise the status of the market/product/service in a short sight.

Figure 9: Example of banana market path



Source: Author's design, 2019

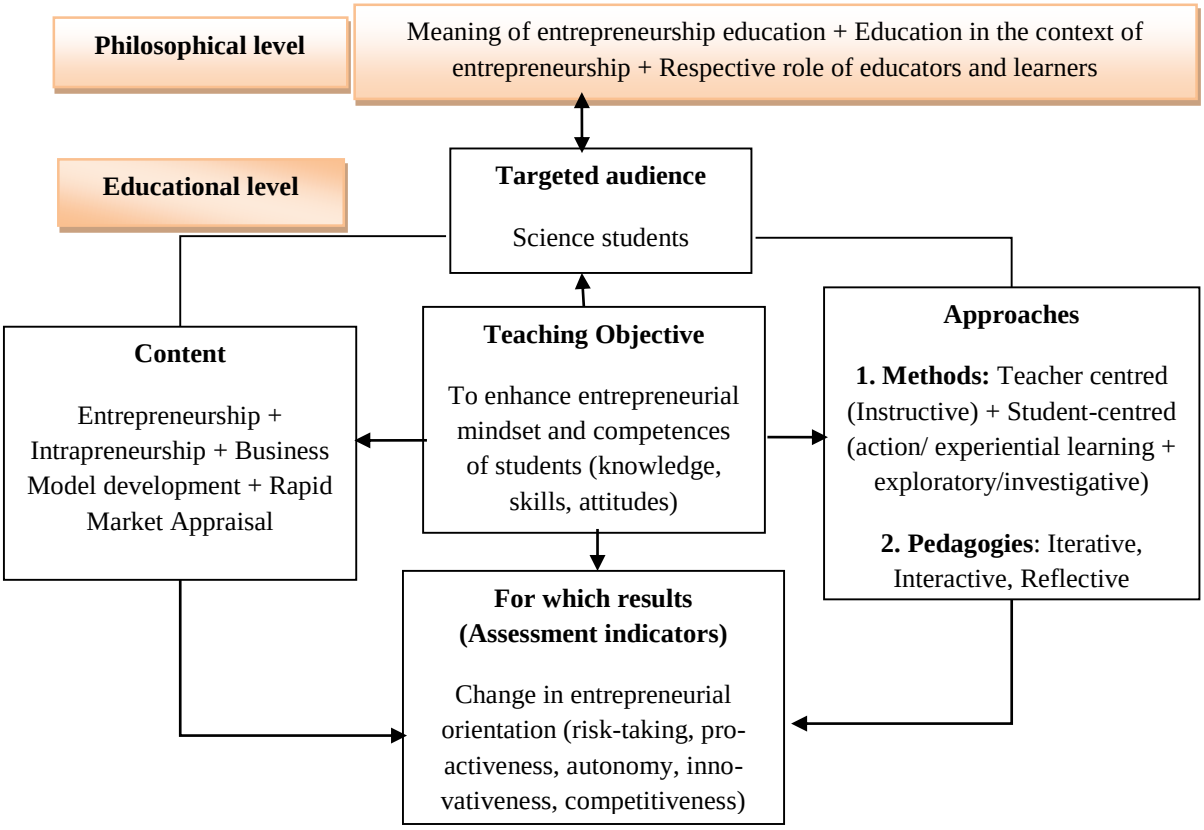
Considered as one of the most important research tools in RMA, Market path is a development of the Participatory Rural Appraisal (PRA) tool "food-path". The "food-path" for example follows an agricultural product from the beginning (seed, breeding stock) to the final product (bread, cheese) (Joss et al., 2002). Market Path takes this idea up to follow a product from the supplier/farm gate to the client with high necessity to get more qualified and quantified results than usually done in the frame of PRA. This implies the value added at each step or the persons involved can be identified (for example, how many beneficiaries and how much revenue is generated along the chain of the product, job characteristics at each step along the product chain, interventions and nature of stakeholders, etc).

3.7. Theoretical framework

As this study focuses on understanding the relationship between entrepreneurship education and entrepreneurial orientation at large, it specifically compares the business plan and the new action-oriented modules, and assesses their outcomes in developing science students' entrepreneurial like-thinking. Since entrepreneurship education teaches students to become employees and (self)

employers of tomorrow, HEIs expect that throughout the learning/teaching process students develop some empathy towards the world of entrepreneurship. In chapter 2 and chapter 3, various thematic components appearing in the following framework have been extensively discussed. By focusing on the new action-oriented module, this theoretical framework captures key aspects of entrepreneurship education both in theory (philosophical level) and in practice (educational level).

Figure 10: New entrepreneurship teaching model



Source: Author's design, 2019

As an experiential and action-oriented model of teaching, its implementation process involves identifying and setting the teaching/learning objectives, determining the target group, content, methods and results expected. In this EE for EO of students, following are proposed hypotheses.

- There is a positive relationship between the taught entrepreneurship education modules and students' entrepreneurial orientation
- The new action-oriented module induces higher effects on students' entrepreneurial mindset values and competences than the traditional business plan.

3.8.Summary of the theoretical and module design literature

We have identified that entrepreneurship education aims at building the enterprising competencies of individuals who are capable of identifying opportunities and developing ventures through becoming self-employed, setting up new businesses; or developing and growing part of an existing venture. This ability enables them to understand well current opportunities and seek out new opportunities for the future; have higher aspirations in their careers; be resilient; and better adapt to change (QAA, 2018). EE enhances learners' entrepreneurial orientation which refers to processes, practices, and decision-making activities that involves the intentions and actions of key players functioning in a dynamic generative process aimed at new-venture creation" (Koe, 2013; Lumpkin & Dess, 1996). However, the objective can also be working for others using the same entrepreneurial values and competences. Within any society, people with such entrepreneurial mindset need to be supported and any educational training program should enable people not just to develop skills to start a business, but also be capable of behaving entrepreneurially in whatever role they take in life (Kelley et al., 2011).

However, Cooney (2012) says in his argument that entrepreneurship teaching approaches should change. Business plan (though still important and crucial) is portrayed as being static and focuses heavily on various functional activities of an enterprise. Given the changes in the modern business environment, it is argued that alternative models of EE should develop a dynamic entrepreneur with a range of behavioural attributes. It is expected to develop highly minded and active graduates. These theories have been elucidated in the EE and EO literature and the module design.

The literature also showed that with a lot of investment in entrepreneurship education worldwide, it is important to articulate what people are teaching and why, along with the specifics of where, how, and to whom" (Middleton & Donnellon, 2014; Mwasalwiba, 2010). All the learning processes and approaches transfer the knowledge (Cognition), skills (psychomotor) or attitude (affective) but the emphasis varies depending on the learning objectives and transmission approaches (student or teacher-centred, experiential or instructive). We are convinced that business planning produces and develops some entrepreneurial values (though criticised to be more process and management oriented as elaborated in the literature). We are also convinced that without being too much process and management oriented, the alternative module produces and develops some entrepreneurial values. All modules aim at developing competences that are applicable in the (job) market and that can be the basis for the learner's career determination.

4. CHAPTER FOUR: RESEARCH METHODOLOGY

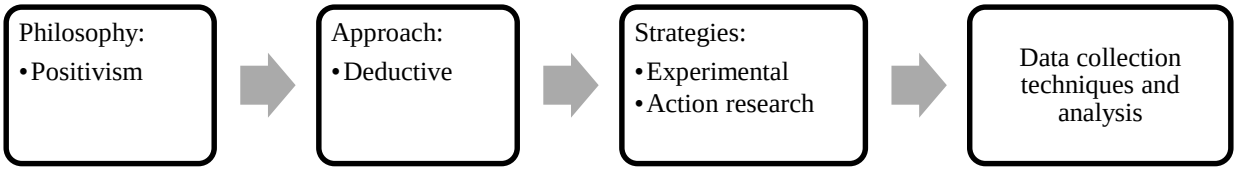
4.1.Research design

Starting the research requires first reading what other researchers in the area have already found out. The purpose of reading is to identify research philosophies that underline causes and effects between concepts (Saunders et al., 2009); the reality of what surrounds us and the nature of that existence (Gray, 2014). In the process of understanding questions are asked, hypotheses are developed and tested, theories are developed, and from theories knowledge is created, justified and transmitted. Since the precise purpose of the literature review depends on the approach intended for use in the research, there has to be a research philosophy behind it that relates to the development of knowledge and the nature of that knowledge. Therefore, in this research study and research design two important points are covered at two levels: Philosophical level and Educational level. The philosophical level explains the meaning of entrepreneurship education, what education means in the context of entrepreneurship and entrepreneurial orientation, and the respective roles of educators and students/participants. The educational level also discusses about entrepreneurship education in terms of objectives (Why?), audience or targets (For Whom?), content (What?), methods and pedagogies (How?), evaluations/assessment (For which Results?). This chapter describes approaches used to collect and analyse data regarding the effectiveness of entrepreneurship education on students' entrepreneurial orientation in Rwanda.

4.2.Research philosophy and approaches

The research philosophy adopted contains important assumptions about the way in which the world is viewed and such assumptions underpin the research strategy and the methods chosen as part of that strategy (Saunders et al., 2009). The following figure depicts this research process.

Figure 11: Research methodological approach



Source: Author's design based on Saunders et al., 2009

Positivism and deductive research approaches are the drivers of this study. According to Saunders et al. (2009) there is a direct link between positivism philosophy and deductive and inductive research approaches. Positivism perspective states that reality exists outside of the researcher and this reality has to be studied with scientific rigor (Gray, 2014). Deductive approach is used to identify theories and ideas that are tested using data while inductive approach explores data in order to develop theories that will subsequently relate to the literature.

4.3.**Research strategies**

4.3.1. Experimental research strategy

As this study evaluated the changes in the students' entrepreneurial orientation before and after undergoing entrepreneurship training, the research strategies used were experimental and action oriented. According to Hakim (2000) the purpose of an experiment is to study causal links; whether a change in one independent variable produces a change in another dependent variable. Control and treatment groups are established and members are randomly assigned to each for subsequent intervention or manipulation (Saunders et al., 2009). In this study entrepreneurship education and Entrepreneurial orientation are the independent and dependent variables respectively. Two groups were formed, one for control and another for treatment. As the content and pedagogies for teaching entrepreneurship detail every step (see annex 1 and 2), EE type 1 (Business plan) was delivered to Control group and subsequent evaluation of changes in EO was made. EE type 2 (New action-oriented module) was delivered to the treatment group and evaluated changes in EO of participants. We assessed and compared results of the two groups.

4.3.2. Action research strategy

For the action research strategy, it takes place within a specific context and commences with a clear purpose or objective (Robson, 2002). It operates in a spiral manner where the emphasis lies on the iterative nature of the process. The process begins with diagnosing (fact finding/analysis using either qualitative interviews or quantitative analysis of questionnaire – details are found in chapter 4.4.4.) and goes through planning, taking action and finally evaluating. This final theme (evaluating) suggests that action research should have implications beyond the immediate project. In other words, it must be clear that the results could inform other contexts and that action research is linked to an explicit concern for the development of theory. It is possible to draw similarities between action research and Kolb's experiential learning. Kolb's cycle identifies four key stages

through which the learner passes including actual/concrete experience (doing/having experience), reflecting (feel/review and reflect upon), and theorizing/ abstract conceptualisation (building knowledge and supports for further reflection/ learning from the experience) and active experimentation (planning/trying out what you have learned) (Gibb and Price, 2014).

- **Organization of the Action research strategy**

This process respected the following order

- Setting the purpose of the research: To assess changes in students' EO induced by the new action-oriented module
- Determining key activities and research process steps:
    a. Diagnosing (fact finding/analysis): Literature review + interviews with managers and class representatives of the sampled programs
    b. Planning: Designing modules to teach (Content and pedagogies) + research instrument
    c. Acting (see next table 19): active implementation of the plan
    d. Evaluating: data collection using observation, research instrument before and after training in order to analyse changes in EO.

Table 19: Action/experiential research process

Content	Experiential/Action research implementation process
Entrepreneurship and Intrapreneurship	• Teacher introduces the course and collects students' expectations • Teacher explains concepts (power point presentation + handouts) • Students ask questions and get feedback • The teacher asks each student to evaluate how s/he feels in terms of EO using a standardized questionnaire
Business Idea generation and Selection	• Teacher explains concepts and tools (Brainstorming and Mind mapping) using power point presentation + handouts • Teacher introduces a Business Idea Conceptualization (BIC) Form and uses one idea as an illustration in class • Students ask questions and get feedback • Each student develops own idea using the BIC form and presents in class (Q&A for 5min each) • Students select few best business ideas around which they form groups of 5 members maximum • Groups discuss and develop the idea, do SWOT analysis and present in class • All students vote for the best business idea • The teacher is a coach who moves from group to group in the whole process
Business Model development	• Teacher explains concepts and tools (Value proposition and business model canvases) using power point presentation + handouts

	• Groups organize themselves and develop the Business Model based on their business ideas • The teacher provides coaching and moderation in the process
Rapid Market Appraisal (Product/service chain analysis)	• Teacher explains concepts and tools (Interview guide, Consumer/producer checklist, Market map, Market path) using power point presentation + handouts • Teacher uses a demonstrative example and invites learners' attention as they will replicate the exercise during the field research assignment • The teacher invites an entrepreneur for experience sharing and students ask questions about the market/product/service • Teacher and students agree on the basic behavioral rules for field research • Students get out to the field to find facts related to their group idea: one part interviews producers, another interviews consumers • Group members discuss and reflect on the field process and results, • Groups design market/product/service map and path; show consumers and producers data side by side as collected from the field • Groups integrate the field information into the business model • Groups present findings in class using visual representation (business model and market/product/service map and path) • The audience is requested to provide inputs for idea improvement • The audience votes for the best presentation • The audience gives their perception about the whole process (teaching and research) and lessons learnt • Using the same questionnaire, the teacher asks each student to assess how s/he feels s/he progressed in EO compared to the status before the training.

Source: Author's elaboration, 2019

For the Business Plan which was predominantly instructive (teacher-centred) the research strategy followed similar steps like in the first two components of the experimental/action research but differed in the business planning processes. In the latter, the teacher explained the different components of the business plan (concept explanation) and the process of developing such component(s) as an integral part of a business plan, asked students to fill in the forms for each of the components based on their group ideas, asked students to read publications and provide genuine information about their markets/products. Students were asked to present their work in class and, submit the assignment for marking before sitting a summative examination (to check whether they understood the concepts and processes). After class presentation each participant assessed him/herself about how s/he feels s/he progressed in EO using the same questionnaire.

4.4. Data collection process and techniques

In this point we describe first the place and environment in which the experimental and action research took place; second, collection techniques; and third, the analysis.

4.4.1. Description of entrepreneurship education environment at INES-Ruhengeri

The Institut d'Enseignement Supérieur (INES) de Ruhengeri is a higher education institution created in the year 2003. It is located in the Northern Province of the Republic of Rwanda. Its population reached 3298 undergraduate and Master students during academic year 2017-2018. Since its creation the Faculty of Economics, Social Sciences and Management (FESSM) dominated other faculties in terms of numbers largely due to the Government decision (2004) of employing at least Bachelor holders in public positions. For that cause not qualified employees joined HEIs for getting a higher degree. On the other side, the government's education policy promoted science subjects at high school level. Ten years down the road, the situation reversed, and more science students have been joining universities from high school. INES was not spared; the share of science students was 63% out of a total population of 3379 registered in the academic year 2015–2016[6].

When the module of entrepreneurship was introduced in the academic year of 2011–2012, it cut across all departments in the Faculty of Economics, Social Sciences and Management. The focus was (has always been) the business plan development -which still remains the dominant method in entrepreneurship teaching- followed by class discussions and case studies. In 2013–2014, a cross-campus curricula revision adopted a new teaching approach centered on the student. It was also referred to as "competence-based teaching approach". The aim was to extend this approach beyond entrepreneurship courses within the campus. The INES-Ruhengeri recommended all departments to include entrepreneurship module in their programs. The purpose was not only to link academic knowledge and skills with markets but also to allow the growing number of undergraduate students in sciences the same opportunity to acquire entrepreneurial skills that link disciplinary knowledge with the market. As a result, the entrepreneurship course was incorporated in all departments of the Faculty of Applied Sciences: Statistics Applied to Economy (SAE), Civil Engineering (CE), Land Survey (LS), Land Administration and Management (LAM), Biotechnologies, Computer Science (CS) and Biomedical Laboratory Sciences (BLS). By the time of the research CS and BLS were the youngest departments with only two intakes and no students in the pre- or final year. Students in final or pre-final years in Biotechnologies, SAE, and Land survey were the only ones having entrepreneurship courses. In this study, students in SAE

[6] http://ines.ac.rw/ines-facts-figures/ accessed on June 18, 2018

were excluded because since the first year they are exposed to courses related to economy and business. CE had no such a course in their program.

Table 20: Entrepreneurship module content in science departments at INES-Ruhengeri

Department of Land survey	Department of Biotechnologies
Module Title: Entrepreneurship Development (50hrs)	**Module Title**: Professional experience. Combines both Entrepreneurship training (30 hrs) and Industrial attachment (70hrs)
• Key concepts and theories of entrepreneurship • Characteristics, role and contribution of entrepreneurs • Critical role played by entrepreneurship in sustainable development of the society • Business planning process	• Aspects of starting a small business • Small enterprise development in the area of food processing and conservation. • Planning, Bookkeeping and accounting for small enterprise • Marketing for small enterprise • Proposal writing and fundraising for small enterprise • Risk management and insurance for small enterprise

Source: Departments' curricula, 2016

4.4.2. Data collection and measurement of EO

In this process, the researcher collects, and measures data related to students' entrepreneurial orientation. As already discussed the notions of entrepreneur, entrepreneurship and intrapreneurship come together in the term entrepreneurial orientation (EO) (Segers et al., 2012). While entrepreneurship is associated with an action or mind-set of an entrepreneur in general, EO is the description of the characteristics of such an entrepreneur. EO dimensions (risk-taking, proactiveness, autonomy, innovativeness and competitive aggressiveness) are often assessed in an environment of doing where firms apply them in the process of decision making. Different studies have covered and used such dimensions in measuring different aspects and levels of firm performance. This study also borrows from Lumpkin and Dess (1996), Taatila and Down (2012) and others (ref. Table 2) to design the dimensions and indicators for measuring EO.

Though living in different environments and operating from different perspectives, students exhibit characteristics and behaviours which are quite like those characterizing entrepreneurial aspirations (self-efficacy, locus of control, proactiveness, competitiveness, creativity…). However, for some dimensions such as innovation which contains value-adding implementation and is thus much more than just a creative process, it is somehow difficult to use creativity measures as such (Taatila and Down, 2012). Innovation is hardly applicable to students who don't own any business or whose activities have never exposed them to business attachments (product

development or patent creation). However, orientation towards innovation for students was measured by asking questions about how they are attracted and interested by novel changes in their own lives. The same approach applied to risk-taking and proactiveness.

Five dimensions were used in this study for measuring the changes in students' entrepreneurial-like thinking. They comprised twenty-three indicators which are listed under each dimension. A seven Likert scale measurement was applied to each indicator. 1 = Strongly disagree, 2 = Disagree, 3 = Disagree a bit, 4 = Neutral, 5 = Agree a bit, 6 = Agree, 7 = Strongly agree. A seven Likert scale was chosen in order to push respondents reflect a bit more on their answers after observing (in the pretest) that they had the intention of scoring around the medium when it was a five-point scale. The seven-point scale has two more rating options and is neither too short nor too long.

Table 21: Operationalization of EO

Dimension	Indicator
Risk-taking	I am highly committed to exploration of new areas
	I highly value choosing a profitable opportunity with risky alternatives than a safe opportunity with less profit
	I prefer doing things differently from generally accepted standard
	I have confidence in my ability to succeed despite challenges
Proactiveness	I always look for establishing new relationships
	I am committed to developing healthy relationships
	I try my level best to be first to market or first to imitate
	I very often talk business topics with my peers
	I am committed to taking initiative and pursuing new opportunities
	I am highly committed to achieving my goal
Autonomy	I am very self-directed in the pursuit of opportunities
	I am able and put forward to function independently
	I rarely depend on others' approval for executing assignment
	I am not worried to leave secure positions in order to promote novel ideas or venture into new fields

Innovation	I am always attracted by creativity and opportunism
	I am always more interested in value of achievement than money
	I often have the tendency to engage in and support new ideas
	I spend most of my time thinking on novelty
	I often show high interest in experimentation and creative processes
Competitive aggressiveness	I am always committed to seeking new opportunities
	I rarely give up until my idea becomes a reality
	I keep trying no matter the number of failures in the process
	I am happy and comfortable in a leading position

Source: Author's elaboration, 2019

4.4.3. Data collection: Sampling

This study purposively and randomly targeted students in science majors at INES-Ruhengeri. It purposively excluded students in business faculties because they have backgrounds in business related concepts. Were also excluded any other student in science majors who attended any training related to business skills development before. Such stances were motivated by the following argument: One school of thought of entrepreneurship (which I follow here) asserts that entrepreneurs are made (Segers et al., 2017). If entrepreneurs are made that means they are taught to become entrepreneurs (methods vary). In this category of "making" we find those who exhibit interest and proactive behaviours towards entrepreneurship subjects. At school such students go mostly to business departments or if they are not in business departments, they look for opportunities to attend entrepreneurship trainings. We therefore exclude any prior academic influence on their learning process and assume they have the same basis. We identified three departments of Civil Engineering, Biotechnologies and Land survey that had a population of 129 students, but data was collected from 117 students. As shown in the following table, 37.6% of the total 117 respondents are students from civil engineering. Biotechnologies and Land survey share almost an equal percentage of respondents with 30.8% and 31.6% respectively.

Table 22: Number of respondents by department

Department	Frequency	Percent
Civil engineering	44	37.6
Biotechnologies	36	30.8
Land survey	37	31.6
Total	117	100.0

Source: Author's elaboration, 2019

In each department students were randomly separated into two groups: Control group (49 respondents) and Treatment group (68 respondents). Comparison within groups shows that 42.9% of respondents within CG were from civil engineering whereas biotechnologies registered the lowest score of 22.4%. Within the treatment group biotechnologies scored the highest (36.8% of respondents) and land survey the lowest (29.4% of respondents).

Table 23: Number of respondents by control and treatment groups

Department	Control group (N=49)	Treatment group (N=68)
	Percentage	Percentage
Civil engineering	42.9	33.8
Biotechnologies	22.4	36.8
Land survey	34.7	29.4
Total	100	100

Source: Author's elaboration, 2019

4.4.4. Data collection: techniques

Different data collection methods can be used including qualitative, quantitative and mixed research methods. According to Wyse (2011), qualitative research is used to gain an understanding of underlying reasons, opinions, and motivations by using various data collection methods including unstructured or semi-structured techniques (focus group discussions, in-depth interviews, key informant interviews, and participation observation etc). Not only it provides insights into the problem but also it helps to develop ideas or hypotheses for potential quantitative research. It is also used to uncover trends in thought and opinions, and dive deeper into the problem. On the other side, quantitative technique is used to quantify the problem (attitudes, opinions, behaviours, and other defined variables) by way of generating numerical data or data

that can be transformed into usable statistics. It is used to generalize results from a larger sample population and its data collection methods are much more structured than the qualitative (online, paper, mobile and kiosk surveys; face-to-face and telephone interviews; and other various types of data collection- longitudinal studies, website interceptors, online polls, and systematic observations). Quantitative research uses measurable data to formulate facts and uncover patterns in research (Wyse, 2011).

The mixed method used in this study combines both qualitative and quantitative data collection methods (Tashakkori and Teddlie, 2003) and has become more popular in recent years (Creswell and Clark, 2007). According to Kibona (2018, p. 75) "this kind of research design is particularly required when a researcher wants one of the following; to use one method to validate the other, to clarify unexpected findings, to use one method to inform the other method and to build a theory and test it." By applying the mixed research method, qualitative approach was used in a sequential and exploratory manner to inform the quantitative.

The qualitative or exploratory data collection phase checked about entrepreneurship teaching in the literature and the discussions held with Heads and class representatives of the sampled programs. We explored the curricula contents in different departments in order to identify similarities and differences, talked to individual module leaders as well as Heads of Departments (HoDs) in order to have their opinions about the following questions:

1. Why do you think entrepreneurship course should be taught to science students?
2. What do you think should be the focus in teaching entrepreneurship at your department?
3. Do you think students who are trained in entrepreneurship get any additional advantage compared to those who are not? If yes, which advantages?

The intention of asking same questions was to assess the matching of the interests and expectations between program managers and beneficiaries.

This phase discovered that entrepreneurship was taught across all majors except three out of six departments in science majors. The interaction with HoDs and class representatives in the three remaining departments identified limited and vague understanding about entrepreneurship but, on the positive note, they showed willingness to have the module taught in their programs.

Table 24: Qualitative data collection plan

Activity	Concerned unit	Number	Time allocated
Exploring the curricula contents	All departments at INES	12	5 days
Observation of students' learning behaviours	Module leader	2	Training period
Interviews (Not structured)	Head of the sampled Department	3	20-30min/person
Interviews (Not structured)	Class representative of the sampled department	3	10-20min/person

Source: Author's elaboration, 2019

With the observation approach, teachers had to directly get involved in the learning activity to check and assess the behaviour of learners in the learning process, identify preferences, challenges as well as similarities and differences between the CG and TG.

From the information that were gathered and within the framework of the research objectives, two types of entrepreneurship courses were introduced to students: the business plan and the new action module. After teaching, the module leaders were requested to provide personal observations on the learning and teaching process as of how it happened from the beginning till the end.

The quantitative data collection phase was used in order to examine the phenomenon in a more generalised way. Data were collected twice -at the beginning and at the end of the module delivery.

4.4.5. Data collection: instruments

For the qualitative data, an interview guide was used. For quantitative data standardised questionnaire was developed and pre-tested to a small group of students before the module was delivered. This helped in identifying gaps linked to the design and understanding of the questionnaire. During the pre-test, it was observed that some terminologies were new to the majority of respondents. It therefore resulted into translation of the questionnaire from English to Kinyarwanda (local language); and the presence of the teacher in order to provide further clarifications whenever respondents were filling the questionnaire.

4.5.Data analysis

The process of data analysis goes through three phases: data preparation, descriptive statistics and inferential statistics. In this study data analysis was done in two phases, phase one is a qualitative data analysis while phase two is a quantitative data analysis.

The methods used to analyse qualitative data explored and compared curricula contents in different departments. The interaction with Heads of Departments and class representatives in order to assess awareness and wishes in terms of entrepreneurship course made it easy to identify similarities and differences among the data.

Quantitative data analysis consisted of analysing data from the survey instrument (questionnaire). The analysis went through four steps including data preparation, descriptive statistics, factor analysis and inferential statistics.

4.5.1. Data preparation

Data preparation is understood as data editing, followed by coding and entry. Data editing is a process of checking and adjusting data for omissions, consistency and legibility (Kibona, 2018). During data collection, editing was done immediately after respondents filled the questionnaire. Some editing checked on duplication of answers or omission of respondent identification. If the question was not answered, the respondent was asked to complete the questionnaire. For the errors that could not be detected in class, the in-house editing was done. After editing, coding was the next step.

Charmaz (2006) describes coding as the pivotal link between data collection and explaining the meaning of the data. Smith and Davies (2010) argue that coding does not constitute the totality of data analysis, but it is a method to organise the data so that underlying messages portrayed by the data may become clearer to the researcher. A code is a descriptive construct designed by the researcher to capture the primary content or essence of the data. Coding is an interpretive activity (Theron, 2015). So, for permitting the transfer of data from questionnaire to the computer, numerical symbols were assigned to represent the meaning of data in the data collection tool. The ordinal variables were coded according to 1-7 Likert scale. After the coding step, data were entered into SPSS version 16 and the dataset was developed ready for data analysis.

4.5.2. Descriptive statistics

After editing, coding and entering data into SPSS, the next step was the analysis of descriptive statistics. Descriptive statistics is the first component of statistics that gives numerical and graphic procedures to summarise the collection of data in a clear and understandable way. The second component is inferential statistics that provides procedures to draw inferences about a population from a sample. Descriptive statistics describes the basic characteristics such as central tendency, distribution and variability. They provide simple summary about the sample and measures, and together with simple graphics analysis, they form a basis of inferential analysis. Since the numerical and graphical approaches complement each other, it is wise to use both (Ibid). Therefore, in this study the descriptive statistics in frequencies and percentages have been presented in tabular forms, and where relevant, mean and mode were shown to describe central tendency, while standard deviation showed variability.

4.5.3. Factor analysis

As a tool for investigating variable relationships particularly for the concepts that are complex to measure, factor analysis helps researchers reduce large number of variables into few factors that can be easily interpreted (Kibona, 2018). This research involved 23 variable items and therefore 23 factors which could be analysed. We therefore referred to factor analysis to reduce variable items and define clearly the number of factors that could reflect the number of constructs and sub-constructs. In the process four steps were followed:

1. To justify the sample size and chosen variables for the factor analysis.
2. To conduct preliminary analysis so as to test whether the sample size is suitable for factor analysis or not
3. To extract factors by using the factor loadings
4. To rotate the factors in order to identify the variables that should be removed in the intended constructs.

4.5.3.1.Justifying the sample size and chosen variables

This step looked only at subjective variables that express opinion about how respondents feel and evaluate themselves in EO dimensions. Objective variables such as age, sex, study department, habitat, group belongingness and relationship with entrepreneurs were not included. Based on the literature review, the following table shows the dimensions and the number of variables for the factor analysis in the constructs

Table 25: Dimensions and number of variable items

Dimension	Number of variable items
Risk-taking	4
Proactivenes	6
Autonomy	4
Innovativeness	5
Competitive aggressiveness	4

Source: Author's elaboration, 2019

For measuring the reliability of sample size in factor analysis, Tabachnick and Fidel (2001) recommend a good comforting sample size of at least 300 respondents. They consider a sample size of less than 100 respondents as poor. On the other side, Kaiser-Meyer Olkin (KMO) of measure of sampling adequacy can be used to measure the reliability of sample size for factor analysis. KMO as the ratio of the squared correlation between variables to the squared partial correlation between variables suggests that if a KMO value is greater than 0.5, it is acceptable (Keiser, 1974). Thus, factor analysis was reliably acceptable because the KMO value was 0.669.

4.5.3.2.Preliminary analysis

The quality of factor analysis was measured through variable correlation, KMO measure, Bartlett's test of sphericity and covariance matrices. Pallant (2005) recommended that for a good factor analysis several variable correlations in the correlation matrix should be at least above 0.3. or 10%. In the previous paragraph the KMO measure for our study is 0.6 (above 0.5 recommended); therefore, it is acceptable. With regard to Bartlett's test of sphericity that measures whether the variable correlations are large enough for factor analysis (Field, 2005), in this study the test was highly significant ($p<0.000$). Based on preliminary analysis, all variables have satisfactory characters for the next steps for factor analysis.

4.5.3.3.Factor extraction

In order to extract factors, the Principal Component Analysis (PCA) method was used. Normally in any factor analysis, the number of factors is equal to the number of items that are subjected to factor analysis (Kibona, 2018). The number of items in this factor analysis is 23 which mean the maximum possible number of factors is 23. It is recommended to determine and extract the factors that have significant contribution to data's variance. Numerous factor retention strategies that

determine the number of factors to be retained exist. According to Field (2005) one popular and common retention strategy –also used here- consists of retaining all factors that have eigenvalue greater than 1.0. Eight factors that contributed 62.3% of the data's variance were retained in SPSS. The first factor's contribution is 17.30% while the eighth factor's contribution is estimated at 4.40%.

4.5.3.4.Determining the factor loadings Patterns

After running factor extraction, analysis went on for showing the relative contribution of each of the 23 items included in the factor analysis to each of the eight retained factors. Once again, the principle component analysis was re-done with the fixed number of factors to 8. Costello and Osborne (2005) concur with Velicer and Fava (1998) that item communalities are considered "high" if they are all 0.8 or greater– but this is unlikely to occur in real data. Rather, in the social sciences, more common magnitudes are low to moderate communalities of 0.40 to 0.70. So, if an item is less than 0.40, it is either not related to the other items or an additional factor should be explored (Costello & Osborne, 2005). In the same authors' view, Stevens (1992) and Field (2000) also argue that factor loadings with value greater than 0.4 can be retained for interpretation.

Following the above description, factors and variable items distribution was checked through component structure matrix (Annex, 11). However, it turned challenging to interpret as the distribution of variables in different factors could not facilitate the task. This is how the distribution looked like:

- The factor loadings of less than 0.4 were suppressed
- In the first factor there is 0 variable item related to risk taking, 3 variable items related to proactiveness, 3 variable items related to autonomy, 3 variable items related to innovativeness, and 3 variable items related to competitive aggressiveness
- In the second factor there are 2 variable items related to risk taking, 2 variable items related to proactiveness, 1 variable item related to autonomy, 1 variable item related to innovativeness, and 1 variable item related to competitive aggressiveness
- In the third factor there is 1 variable item related to proactiveness and 1 variable item related to innovativeness
- In the fourth factor there are 2 variable items related to risk taking, 1 variable item related to proactiveness

- In the fifth factor there is 1 variable item related to risk taking, 2 variable items related to proactiveness
- In the sixth factor there 1 variable item related to autonomy, and 1 variable item related to innovativeness
- In the seventh factor there is 1 variable item related to innovativeness
- In the eighth factor there are 1 variable item related to risk taking, and 1 variable item related to competitive aggressiveness

After checking this factor and variable items distribution, interpretation was found complicated. It was necessary to do factor rotation in order to show which items come together and, for that purpose, simplify the interpretation.

4.5.3.5.Factor rotation

According to Costello and Osborne (2005) the goal of rotation is to simplify, clarify the data structure by showing which items come together. This is done through two main approaches: the first rotation results into correlated factor solution; the second results into uncorrelated factor solution. Uncorrelated factor rotation normally produces results that are easier to interpret, however it requires a researcher to assume that no correlation among the underlying factors exists (Kibona, 2018). In social sciences this seems difficult. It is argued that in the social sciences some correlation among factors is generally expected since behaviour is rarely partitioned into neatly packaged units that function independently of one another (Costello and Osborne, 2005). On the other hand, correlated factor rotation allows correlation among the underlying constructs although the results are difficult to interpret. Therefore, we assumed the underlying factors are correlated and resorted to Promax method for correlated factor rotation. Results in the Pattern matrix shows that some variable indicators could be eliminated and others with factor loadings above 0.5 could be retained:

- In the first factor 3 variable items related to innovativeness dimension were recorded, 1 variable item under proactiveness and another under autonomy were also recorded;
- In the second factor 3 variable items related to autonomy dimension were recorded;
- In the third factor 3 variable items related to competitive aggressiveness dimension were recorded.

- In the fourth factor, the dimension of proactiveness counted 4 variable items related to it: 2 were recorded in the 4th factor and other 2 variable items were recorded in the 3rd factor;
- In the sixth factor 3 variable items related to risk-taking dimension were recorded;
- In the seventh factor, 4 variable items were recorded whereby 1 variable item in risk taking and another 1 in proactiveness. The other 2 variable items were under proactiveness and competitive aggressiveness;
- In the eighth factor, five variable items were recorded whereby 3 of them involving 2 in proactiveness and 1 in innovativeness. The remaining 2 variable items belong to risk-taking and autonomy respectively.

From our observation, a total of 16 variable items could be retained if we counted a minimum of 3 variable items per factor per dimension. As per Costello and Osborne's (2005) recommendation, a factor with fewer than three items is generally weak and unstable; 5 or more strongly loading items (0.50 or better) are desirable and indicate a solid factor. In this study, the number of variable items per dimension is between 4 and 6 which are considered a reasonable number very close to the 5 items recommended. The same authors argue that if an item loading is less than 0.40, it is either not related to the other items or an additional factor should be explored. In this study 22 out of 23 variable items loaded above 0.50 and only one loaded between 0.40 and 0.49. Thus, we concur with Stevens (1992) and Field (2000) who assert that factor loadings with value greater than 0.4 can be retained for interpretation. As a conclusion, all 23 variable items were retained for further interpretation.

Another key observation that came out of the structure matrix assessment demonstrated that some entrepreneurial characteristics/attitudes under innovativeness interact with some others under proactiveness and autonomy (factor 1). The interest in value of achievement, support for new ideas and search for novelty were seen associated to the desire of venturing into new fields including market. Similarly, close interconnection between competitive aggressiveness and proactiveness was observed as some characteristics could be found in the same factor 3. Resilience, trials as well as leadership are entrepreneurial qualities that are closely linked to market penetration as well as for goal achievement.

4.5.4. Inferential statistics

In a case whereby the study has quantitative data, the data can be analyzed using either descriptive or inferential statistics. It is possible to use both statistical methods, but this will result in two different purposes: description and conclusion. Inferential statistics are used when the researcher wants to move beyond simple description or characterization of data so as to draw conclusions based on the data. Inferential analysis results show the relationships among the variables in the study and determine the population behaviour through analysis of sample taken from a particular population. In this study 129 students were targeted but 117 students responded to the questionnaire. Before conducting the inferential analysis, we tested the normality of the data. Most of them were not normally distributed. When such result is obtained, non-parametric test is used in order to increase reliability. In this case we used Mann-Whitney U test.

4.5.5. Mann-Whitney U test

The Mann-Whitney U test is a very commonly used test in behavioural sciences to analyse non-parametric data. It was independently worked out by Mann and Whitney (1947) and Wilcoxon (1945) and is often called the Wilcoxon-Mann- Whitney test or the Wilcoxon sum of ranks test (Nachar, 2008). It can be used to answer the questions of the researcher concerning the difference between two independent groups. The Mann-Whitney test is based on the comparison of each observation from the first group with each observation from the second group. The data from each group are then individually compared together. It has the great advantage of possibly being used for small samples of subjects (five to 20 participants). In this study, Mann-Whitney U test was used to compare changes in student's entrepreneurial-like thinking (also known as Entrepreneurial Orientation) before and after attending the training in entrepreneurship. As earlier mentioned, two types of trainings were delivered to the Control and Treatment groups.

4.6.Validity and Reliability

It is stated that ensuring validity and reliability is the most important issue in the research. The primary requirement of quantitative researchers is the construction of instrument(s), and administration in standardized manner based on the predetermined procedures (Bashir et al., 2008). According to Dooley (1990), data validity refers to the appropriateness, meaningfulness, and usefulness of the specific inferences made from measures. Validity can be about measuring instrument (content validity) or the degree of relationship between the study problem, instruments

and variables (construct validity) (Kibona, 2018). On the other side, Bashir et al. (2008, p.36-37) elaborate on reliability to say that it refers to the degree to which observed scores are "free from errors of measurement" and the extent to which results are consistent. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. To summarise, the definitions of reliability and validity in quantitative research reveal two strands: Firstly, with regards to reliability, consistency, stability and predictability (synonyms for reliability), whether the result is replicable. Secondly, with regards to validity, truthfulness, accuracy, authenticity, genuineness, or soundness (Synonyms for validity), whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure.

In qualitative research, reliability and validity are conceptualized as trustworthiness, rigor and quality (Seale, 1999). That can be achieved by eliminating bias and increasing the researcher's truthfulness of a proposition about some social phenomenon using triangulation (McMillan and Schumacher, 2006). Triangulation is typically a strategy for improving the validity and reliability of research or evaluation of findings. Triangulation strengthens a study by combining methods (quantitative and qualitative) such as, observation, interviews and recordings that are believed to lead to more valid, reliable and diverse construction of realities.

In this study, informal and not-structured interviews with students and Heads of departments were conducted in order to know what they think about teaching entrepreneurship at INES-Ruhengeri. Another interview was done with the second trainer in order to get his perception regarding students' behaviour, challenges and progress throughout the teaching process. A pre-test of the questionnaire was also done for checking the wording and design of the questionnaire. It was observed that: 1) some questions were not clearly understood and had to be rephrased; 2) a translation of the questionnaire from English into the local language was needed and it was done. In order to show the reliability of the constructs, we used Cronbach's Alpha which is a common statistical criterion used to evaluate the internal consistency of the constructs that the survey examines (Gray, 2014; Saunders et al., 2009). According to Nunally (1967), the reliability values are acceptable when they fall between 0.60 to 0.70. The following table presents the constructs as well as their components.

Table 26: Reliability of the EO dimensions

Indicators	Scale Mean if Item Deleted	Cronbach's Alpha if Item Deleted
Risk Taking (Cronbach's Alpha= .803; N of items=4)		
Exploring new areas	17.06	.688
Choosing profitable but risky opportunity	17.43	.810
Doing things differently	17.31	.759
Confidence in own ability to succeed	16.84	.739
Proactiveness (Cronbach's Alpha= .691; N of items=6)		
Establishing new relationships	26.65	.615
Developing healthy relationship	27.02	.655
Being the first to the market or imitate	27.73	.638
Talking business often	28.06	.661
Taking initiatives	27.47	.632
Commitment to achieving own goal	26.43	.692
Autonomy (Cronbach's Alpha=.769; N of items=4)		
Self-direction in pursuing opportunity	10.73	.734
Ability to function independently	10.73	.681
Rare dependency on others for task execution	11.63	.742
Not worried to leave secure position for new field	11.04	.695
Innovativeness (Cronbach's Alpha=.706; N of items=5)		
Attracted by creativity	18.67	.715
Value achievement than money	19.63	.640
Supporting new ideas	18.92	.634
Often thinking on novelty	19.37	.647
Having interest in experimentation	19.00	.646
Competitive aggressiveness (Cronbach's Alpha=.735; N of items=4)		
Always seeking new opportunities	16.61	.689
Rarely give-up until ideas become reality	17.00	.650
Keep trying despite failures	16.71	.670
Happy/comfortable in a leading position	16.78	.690

Source: Author’s elaboration, 2019

5. CHAPTER FIVE: PRESENTATION OF FINDINGS

5.1.Qualitative findings

It should be recalled that before starting delivering entrepreneurship courses to students, the researcher assessed curricula contents of different departments in the faculty of Applied Sciences. Three departments of Civil Engineering (CE), Land Survey (LS) and Biotechnologies (BT) were retained for the provision of the entrepreneurship courses. Not-structured interviews were conducted with three Heads of Departments (HoD) and three class representatives (CR). In these inquisitive discussions the researcher wanted to know their opinion about teaching entrepreneurship in their respective departments. Three main questions were asked:

- Why do you think entrepreneurship course should be taught to science students?
- What do you think should be the focus in teaching entrepreneurship at your department?
- Do you think students who are trained in entrepreneurship get any additional advantage compared to those who are not? If yes, which advantages?

➢ ***Why do you think entrepreneurship course should be taught to science students?***

There are factors that they think contribute to the need of teaching entrepreneurship.

Table 27: Opinion about why teaching entrepreneurship to science students

Nr	Factor	HoD BT	HoD CE	HoD LS	CR BT	CR CE	CR. LS
1	To tackle unemployment facing university graduates	x	x	x			
2	To help students align their education with market needs	x	x		x	x	
3	It is a government policy that must be implemented in order to create own business	x	x	x	x	x	x
4	It is good for an institution of applied science to help students apply their knowledge/ skills in business		x	x		x	
5	To help students to improve on project presentation especially during skills demonstration (career day)	x	x	x			
6	There is a growing number of science students who don't know anything about starting and managing business. This is an opportunity to them	x	x	x			
7	People in the country especially the youth are trained on how to develop projects, therefore universities have to do the same for their students		x		x	x	x
8	It is done in the interest of universities to outreach and impact communities	x	x	x			
9	It is a recommendation of the institution that has to be implemented	x	x	x	x	x	x

10	I don't see why because it is not related to my field of study. But I need it anyway! Maybe I will use it.						x

Source: Author's elaboration, 2019

In relation to the first question, interviewees were asked if they know something related to entrepreneurship and if it makes sense to them to have entrepreneurship as a course in their programs. All the six respondents acknowledged to have heard about it. They understood entrepreneurship in the sense of business creation, job creation and innovation. They were also asked why they think entrepreneurship should be taught to science major students. All Heads of Departments responded that some factors are behind the teaching of entrepreneurship:

- *First, the interest of universities to outreach and impact the community*: they argue that the presence and impact of the HEI institution are assessed through the connections and closeness it has with the people (local, region or beyond) and through solutions it provides to their needs. Therefore, through entrepreneurship, they believe students can develop solutions that address community problems.
- *Second, a growing number of science students who don't know anything about starting and managing business*: given the rise in numbers of students attending science programs at INES-Ruhengeri and the country in general, given that young students have the tendency to concentrate on disciplinary science courses and forget to link them with market, given that universities are better places to initiate the culture of students learning-for-market, respondents argued that teaching entrepreneurship could be a good opportunity to solve the mentioned challenges. This thinking was also linked to internal experiences whereby students in some science departments developed good prototypes but failed to market them during students' competitions (internally or between HEIs) or skills demonstrations organised at faculty or institutional level (also called career days).
- *Third, teaching entrepreneurship is a government as well as institutional policy:* This policy has to be implemented in the aim of sensitizing students that they have to create their own jobs or businesses and not wait for being employed by the government or other organizations. As academic managers, HoDs have to follow this directive. In this sense, from the early moment they join the university, students should be prepared to become self-employed and not to rely much on being employed after graduation.

- *Fourth, from academic perspectives, it is good that the institution helps students to develop their knowledge and skills but insists on applying and aligning them with market needs*. Sometimes, students think that good academic grades are enough to secure a living, but they forget to scan and understand well the environment they will live in after graduation. Respondents argue that once this is well understood and students become capable to predict for the future, it frames their academic exit profiles.

On the side of students, they understand that entrepreneurship should be taught because it is a government policy. Not only is it recommended by the government but also by their academic institution. By looking at both institutions, respondents believe that entrepreneurship will help them to increase skills for creating own businesses. Students think that it is good to know how to create own business and believe the university is the best source of learning. One respondent among students couldn't see why he should study entrepreneurship because he could not establish its relationship with his field of study (land surveying). He however stated that although he is not sure whether he will use it, he may probably need it in the future.

- ***What do you think should be the focus in teaching entrepreneurship at your department?***

For this second question, all respondents mentioned **"**how to create and develop a business". When asked to be more precise, they replied that they should know how to plan for the business, how to make a lot of money (profit) and how to become innovative. They argued that the government and other organizations were training other people in business planning (youth in their areas) and they believe that this helps or can help them to become more successful in starting and managing business. Therefore, having this training provided at their campus was seen as a huge advantage.

- ***Do you think students who are trained in entrepreneurship get any additional advantage compared to those who are not? If yes, which advantages?***

From HoDs perspective, students with entrepreneurship skills could perform better before or after graduation by starting some kinds of businesses. They also expected in the entrepreneurship course an opportunity to foster students' understanding of how markets operate and how they can link their education with societal issues. The HoDs of civil engineering and biotechnologies could immediately link their programs with markets especially in food processing and construction whereby the students have the potential to start small scale businesses. This was due to the

observation that the construction industry is booming everywhere in the country, but the market is still dominated by unskilled labour. Similarly, the country and region depend on agriculture, but few people are skilled in food processing. Therefore, graduates from the two departments have a greater competitive advantage. For the land survey department, there is also conviction that entrepreneurship has some advantages (mostly linked to business planning) although it was not very clear how the students could benefit directly. This is because most of land surveyors were getting employed soon after they graduated and, due to the dominance of the market by bigger organizations, the remaining unemployed graduates were facing scarce market opportunities that could allow them to start own businesses.

On a similar note, representatives of students in CE and BT said that learning entrepreneurship is vital to them because there are a lot of opportunities in agribusiness (farming, processing) and construction. By identifying a number of people around them who successfully started their business without doing training in entrepreneurship, they were convinced that, after graduation, they can also start and run their companies successfully. They believed in high performance of their business because they will be equipped with good knowledge and skills in business planning and management. Additionally, students argued that knowing how to plan and manage a business would help them to start thinking about their career path. Class representatives from all departments argued that entrepreneurship would help them to know how to budget for the business. In this context, emphasis was put on how to raise and manage funds and how to make profits (specifically financial calculations). Finally, students thought that once entrepreneurship course is finished, they would have a good understanding of market environment. Scopes of employment would have expanded and, from there, they would make informed choices.

5.2.Quantitative findings

This considers findings recorded before and after delivering the training to the target group. Feedbacks from 117 respondents are presented, described and compared.

5.2.1. Sample demography

In this phase of respondents' identification, five aspects are described: age, gender, habitat, membership to groups or associations and, closeness to entrepreneurs.

Table 28: Demographic description of respondents by age, gender and habitat

Category	Subcategory	Control group (N=49)	Treatment group (N=68)	Both groups (N=117)
		%	%	%
Age	20-29	93.9	86.8	89.7
	30-39	6.1	10.3	8.5
	40+	-	2.9	1.7
	Total	100	100	100
Gender	Female	38.8	25.0	30.8
	Male	61.2	75.0	69.2
	Total	100	100	100
Habitat	Rural	61.2	51.5	55.6
	Urban	38.8	48.5	44.4
	Total	100	100	100

Source: Author's elaboration, 2019

From this table 28, respondents are categorized according to control and treatment groups. The highest percentages of respondents are found between 20-29 years old and it is visible that majority of attendants in science departments are males. Few are students who joined the university at the age above 30. In terms of habitat, in both CG and TG majority are respondents living in rural areas represented by 61.2% and 51.5% respectively. Given that more than 80% of the total population of Rwanda live by agriculture in rural areas, majority of school attendants come from and stay in the countryside.

Table 29: Description of respondents by membership to groups and closeness to entrepreneurs

Category	Subcategory	Control group (N=49)	Treatment group (N=68)	Both groups (N=117)
		%	%	%
Membership to groups or associations	Business oriented	28.6	22.1	24.8
	Not business Oriented	59.2	66.2	63.2
	No group/association	12.2	11.8	12
	Total	100	100	100
Closeness to entrepreneurs	Relatives	44.9	35.3	39.3
	Colleagues	36.7	39.7	38.5
	Neighbours	18.4	25.0	22.2
	Total	100	100	100

Source: Author's elaboration, 2019

As observed in Table 29, respondents were asked to mention whether they belong or not to groups or associations. Such associations are either business oriented or not. According to their responses, about 88% of the respondents belong to associations but the majority (63.2%) belong to not business-oriented groups. The situation looks similar in both CG and TG. For the category of business-oriented groups, such groups are often family or community saving schemes whereby

members are appealed to contribute on weekly or monthly basis and get their contribution back after a certain period. This rotational and informal saving scheme runs based on mutual trust, it is (less) regulated based on community agreement and is set for supporting members to solving small financial issues. The schemes can grow bigger to the extent of lending and charging small interests. Initially, they start like social support schemes but as they grow, they become more business oriented. On the other side, respondents belonging to not business-oriented associations refer to religious, cultural or rights associations (some are within the campus, others are outside).

On the question of knowing individuals' external entrepreneurial influences, respondents were asked to mention whether they have relatives, colleagues or neighbours who are entrepreneurs. It is observed that respondents have connections with relatives who are entrepreneurs (39.3%) and 38.5% who are colleague entrepreneurs. Both within the CG and TG neighbours who are entrepreneurs registered the lowest percentages. Neighbour entrepreneurs refer to any person who do business in the area of the respondent but who don't share any blood or family relationship.

5.2.2. Descriptive statistics for EO dimensions

In all EO dimensions, the progress is assessed through observing the differences in the mean averages before and after training. Results displayed in the column of the "Mean" show two results: 1) averages "before" and averages "after", 2) the differences between "Mean Average After" and "Mean Average Before". As a reminder, a seven Likert scale measurement was applied to each indicator. 1 = Strongly disagree, 2 = Disagree, 3 = Disagree a bit, 4 = Neutral, 5 = Agree a bit, 6 = Agree, 7 = Strongly agree.

5.2.2.1.Risk taking dimension

The dimension of risk-taking is captured through four indicators including: commitment to exploration of new areas, choosing a profitable opportunity with risky alternatives rather than a safe opportunity with less profit, doing things in a way different from traditionally accepted, and confidence in own ability to succeed. Respondents' levels of self-appreciation in the mentioned points are captured in the following table.

Table 30: Risk taking

Variable name	Group	Period	Responses in percentages							Mode	Mean		SD
			Rating scale										
			1	2	3	4	5	6	7			Δ	
Exploring new areas	CG	Before			2.0	10.2	24.5	30.6	32.7	7	5.82	.49	1.07
		After					12.2	44.9	42.9	6	6.31		.68
	TG	Before	1.5	2.9	2.9	8.8	17.6	35.3	30.9	6	5.68	.88	1.36
		After					7.4	29.4	63.2	7	6.56		.63
Choosing profitable but risky opportunity	CG	Before			2.0	10.2	38.8	38.8	10.2	5[a]	5.45	.73	.89
		After					12.2	57.1	30.6	6	6.18		.63
	TG	Before	7.4	7.4	5.9	22.1	20.6	22.1	14.7	4[a]	4.66	.78	1.74
		After	1.5	5.9	1.5	5.9	27.9	38.2	19.1	6	5.44		1.36
Doing things differently	CG	Before			2.0	12.2	22.4	51.0	12.2	6	5.57	.63	1.00
		After					12.2	55.1	32.7	6	6.20		.64
	TG	Before	4.4	5.9	4.4	13.2	20.6	27.9	23.5	6	5.18	.73	1.66
		After			2.9	5.9	25.0	29.4	36.8	7	5.91		1.06
Confidence in own ability to succeed	CG	Before			2.0	4.1	20.4	32.7	40.8	7	6.04	.33	1.06
		After					10.2	42.9	46.9	7	6.37		.66
	TG	Before		1.5		4.4	11.8	35.3	47.1	7	6.21	-.45	.98
		After		2.9	1.5	1.5	29.4	39.7	25.0	6	5.76		1.08
a. Multiple modes exist. The smallest value is shown													

Source: Author's elaboration, 2019

From this table, it is observed that the TG recorded the highest differences in the mean averages in 3 out of 4 indicators. The CG was superior in only one indicator. Respondents in both the CG and TG had relatively higher progress in choosing profitable but risky opportunity with respective differences of 0.73 and 0.78 in the mean averages before and after training. Doing things differently recorded 0.63 and 0.73 differences in CG and TG respectively. Compared to other indicators, confidence in own ability to succeed recorded the least mean differences in both groups (0.33 in CG and -0.45 in TG). Although this indicator appears with the least progress in the CG, it recorded the highest mode of 7 before as well as after training. This explains that even before being trained, students perceived high their self-confidence in ability to succeed. This situation is closely similar with the TG's feedback. The most progressive indicator of all groups was "exploring new areas" which recorded 0.88 difference in the means in the TG.

5.2.2.2.Pro-activeness dimension

This dimension was assessed through six indicators including search for establishing new relationships, commitment to develop healthy relationships, being the first to the market or to imitate, talking business topics with peers often, taking initiative and pursuing new opportunities,

and commitment to achieving own goal. The literature shows that entrepreneurs are people who engage with others and are always looking for new or long-term profitable relationships. Therefore, depending on their business objectives, this helps them to gain and/or expand their market shares.

Table 31: Pro-activeness

Variable name	Group	Period	Responses in percentages							Mode	Mean		SD
			Rating scale										
			1	2	3	4	5	6	7			Δ	
Establish-ing new relationship	CG	Before			6.1	8.2	6.1	36.7	42.9	7	6.02	.04	1.18
		After		2.0		2.0	20.4	36.7	38.8	7	6.06		1.00
	TG	Before		1.5		4.4	16.2	32.4	45.6	6[a]	5.84	.31	1.26
		After	1.5	1.5	1.5	8.8	16.2	35.3	35.3	7	6.15		1.01
Developing healthy relationship	CG	Before	2.0	2.0	6.1	10.2	16.3	24.5	38.8	7	5.65	1.2	1.50
		After					8.2	38.8	53.1	7	6.45		.64
	TG	Before				8.8	8.8	36.8	45.6	7	6.19	.28	.93
		After					10.3	32.4	57.4	7	6.47		.68
Being the first to the market or imitate	CG	Before	10.2	4.1	6.1	10.2	22.4	24.5	22.4	6	4.94	-.16	1.88
		After	6.1	14.3	10.2	2.0	22.4	22.4	22.4	5[a]	4.78		1.96
	TG	Before	1.5	11.8	13.2	25.0	17.6	17.6	13.2	4	4.51	1.03	1.60
		After	1.5	4.4	2.9	10.3	11.8	48.5	20.6	6	5.54		1.37
Talking business often	CG	Before	4.1	4.1	18.4	14.3	28.6	20.4	10.2	5	4.61	.78	1.55
		After		8.2		12.2	26.5	30.6	22.4	6	5.39		1.39
	TG	Before	13.2	8.8	14.7	5.9	22.1	19.1	16.2	5	4.37	.44	2.01
		After	2.9	4.4	13.2	20.6	19.1	26.5	13.2	6	4.81		1.54
Taking initiatives	CG	Before		4.1	10.2	12.2	28.6	24.5	20.4	5	5.20	.76	1.09
		After				6.1	22.4	40.8	30.6	6	5.96		.88
	TG	Before		8.8	7.4	8.8	25.0	35.3	14.7	6	5.15	.19	1.45
		After	2.9	2.9	2.9	10.3	29.4	32.4	19.1	6	5.34		1.39
Commit-ment to achieving own goal	CG	Before			2	2	14.3	32.7	49	7	6.24	-.18	.92
		After			4.1	8.2	12.2	28.6	46.9	7	6.06		1.14
	TG	Before	1.5	2.9		8.8	14.7	39.7	32.4	6	5.81	.23	1.28
		After			1.5	8.8	13.2	36.8	39.7	7	6.04		1.01

a. Multiple modes exist. The smallest value is shown

Source: Author's elaboration, 2019

In relation to pro-activeness, the displayed results in Table 31 show that the highest progress in the CG took place in the area of developing healthy relationship with 1.2 difference in the mean averages while in the TG was "being the first to the market or imitate" with 1.03 difference. Other areas of high progress in CG included talking about business (0.78) and taking initiatives (0.76) which respectively recorded 0.44 and 0.19 mean differences in the TG. It is observed that being the first to the market or imitate (-0.16) and commitment to achieving own goal (-0.18) registered

negative progress in CG but positive in TG with 1.03 and 0.23 differences in the means. While establishing new relationships (0.04) was also recorded among the least progressed in the CG, it registered small differences (0.31) in the TG. Although the last two constructs (commitment to achieving own goal; establishing new relationships) recorded differences below and around 0 in the CG, they recorded the highest mean averages (above 6) and the highest mode (7) both before and after training.

Like in the CG, indicators related to establishing new relationships and developing healthy relationships recorded higher mean averages in the TG both before and after training and the same situation is observed under "commitment to achieving own goal". This can justify why little changes in the mean averages occurred. In general, despite that being the first to the market or imitate was the most progressive indicator in the TG, business and market related indicators recorded the lowest mean averages and respondents did not developed solid confidence in such areas.

Another general observation in this dimension shows that respondents in both groups recorded relatively lower mean averages in matters related to market and business talks while they recorded higher mean averages in matters related to relationships and goal achievement. From these results it can be deducted that the willingness of respondents to establish and maintain relationships can easily influence business and market collaborations. It also means that if students are involved in market/business related discussions or are given platforms that facilitate interactions with market players, they can easily adapt because they already demonstrated proactive behavioural signs.

5.2.2.3.Autonomy dimension

This dimension was assessed through four indicators. Such indicators are: self-direction in the pursuit of opportunities, ability to function independently, dependency on others for task execution, and lack of worry to leave a secure position to venture into new fields. For an entrepreneur autonomy is an important factor as it deals with the control of resources which, in a way or another, appeals for effective and efficient distribution of them. For students, assessing autonomy can help them to identify whether they are looking for independency or being under the tutelage of somebody else. In other words, self-appreciation with regard to autonomy tells a lot about student choices in relation to entrepreneurial or intrapreneurial orientation.

Table 32: Autonomy

Variable name	Group	Period	Responses in percentages							Mode	Mean		SD
			Rating scale										
			1	2	3	4	5	6	7			Δ	
Self-direction in pursuing opportunity	CG	Before	18.4	10.2	14.3	14.3	14.3	12.2	16.3	1	3.98	.41	2.09
		After	8.2	14.3	14.3	8.2	20.4	18.4	16.3	5	4.39		1.94
	TG	Before	8.8	10.3	11.8	16.2	23.5	17.6	11.8	5	4.35	1.03	1.80
		After	2.9	7.4	16.2	17.6	30.9	25.0		6	5.38		1.45
Ability to function independently	CG	Before	18.4	12.2	18.4	4.1	16.3	12.2	18.4	1[a]	3.98	.31	2.17
		After	10.2	10.2	12.2	14.3	22.4	22.4	8.2	5[a]	4.29		1.81
	TG	Before	13.2	11.8	11.8	11.8	16.2	20.6	14.7	6	4.26	.48	2.01
		After	1.5	10.3	16.2	13.2	17.6	26.5	14.7	6	4.74		1.66
Rare dependency on others for task execution	CG	Before	28.6	22.4	14.3	4.1	16.3	6.1	8.2	1	3.08	.06	1.99
		After	20.4	24.5	20.4	4.1	18.4	10.2	2.0	2	3.14		1.76
	TG	Before	19.1	19.1	11.8	10.3	19.1	13.2	7.4	1[a]	3.60	-.31	1.97
		After	16.2	22.1	19.1	17.6	11.8	10.3	2.9	2	3.29		1.69
Not worried to leave secure position for new field	CG	Before	20.4	14.3	14.3	14.3	12.2	14.3	10.2	1	3.67	-.06	2.03
		After	20.4	14.3	14.3	14.3	12.2	14.3	10.2	1	3.61		2.19
	TG	Before	10.3	14.7	20.6	22.1	8.8	16.2	7.4	4	3.82	.58	1.77
		After	14.7	2.9	10.3	17.6	19.1	25.0	10.3	6	4.40		1.88
a. Multiple modes exist. The smallest value is shown													

Source: Author's elaboration, 2019

Results displayed in the above table show relatively lower rates of self-appreciation in autonomy. In the CG, all indicators under autonomy registered lower mean averages below or around 4 (Neutral). Although respondents registered slight positive changes in three out of four indicators, they demonstrate fears of leaving a secure position to venture into new fields, and still depend on others for task execution. In the TG much progress was registered under "self-direction in pursuing opportunity" which recorded a mean average of 5.38 after training, implying 1.03 difference in the means. This progress might have been triggered by entrepreneurs' narratives during students' field market assessment. Respondents in TG also show low progress in their entrepreneurial thinking regarding autonomy although the situation looks better compared to the one in the CG. It was also noticed that rare dependency on others recorded negative progress (-0.31) which is a clear indication that students rely on instructions or guidance when they have to execute some tasks.

Given such results from both groups, one can deduct that majority of respondents are not ready for creating own venture rather they expect to be employed by somebody else. This is a strong sign that trainers and/or educationists should pay much attention to this aspect of autonomy; find out how best students can lower the degree of dependency. That can imply restructuring the teaching methods or changing the learning environments in order to promote those that infuse and enhance self-dependency. The restructuring is vital for such types of students who are following programs that have high and immediate potential to enter the (employment) market. Students in biotechnologies or civil engineering have for example, given their practice-oriented and technical training, the highest potential to enter the employment market and be successful soon after.

5.2.2.4.Innovativeness dimension

For innovation, five indicators were assessed including attraction by creativity and opportunism, interest in the value of achievement than value of money, tendency to support new ideas, spending most of the time thinking on novelty, high interest in experimentation and creative processes. Many studies have demonstrated that successful and sustainable business is grounded on entrepreneurs' ability to keep finding new opportunities and adding value to them, an attitude that keeps them ahead of competitors.

Table 33: Innovativeness

Variable name	Group	Period	Responses in percentages							Mode	Mean		SD
			Rating scale										
			1	2	3	4	5	6	7			Δ	
Attracted by creativity	CG	Before		2.0	16.3	14.3	22.4	14.3	30.6	7	5.22	.49	1.53
		After		2.0	8.2	4.1	18.4	36.7	30.6	6	5.71		1.29
	TG	Before	1.5	4.4	4.4	7.4	22.1	36.8	23.5	6	5.49	.26	1.40
		After	2.9	4.4		2.9	19.1	38.2	32.4	6	5.75		1.42
Value achievement than money	CG	Before	4.1	6.1	16.3	36.7	18.4	6.1	12.2	4	4.27	.55	1.51
		After	6.1	16.3	6.1	2.0	22.4	24.5	22.4	6	4.82		1.97
	TG	Before	16.2	10.3	11.8	19.1	13.2	13.2	16.2	4	4.07	1.58	2.03
		After	2.9	1.5	1.5	7.4	20.6	41.2	25.0	6	5.65		1.32
Supporting new ideas	CG	Before		6.1	6.1	22.4	26.5	26.5	12.2	5[a]	4.98	.24	1.34
		After	2.0	4.1	8.2	10.2	20.4	40.8	14.3	6	5.22		1.44
	TG	Before	1.5	2.9		11.8	26.5	44.1	13.2	6	5.44	.00	1.18
		After	4.4	1.5	2.9	7.4	25.0	38.2	20.6	6	5.44		1.43
Often thinking on novelty	CG	Before	2.0	6.1	14.3	26.5	26.5	14.3	10.2	4[a]	4.53	.25	1.44
		After	8.2	4.1	14.3	8.2	26.5	18.4	20.4	5	4.78		1.82
	TG	Before	2.9	5.9	13.2	22.1	30.9	14.7	10.3	5	4.57	1.08	1.46
		After		1.5	4.4	7.4	23.5	41.2	22.1	6	5.65		1.13

Having interest in experimenta-tion	CG	Before		4.1	18.4	12.2	30.6	18.4	16.3	5	4.90	.59	1.44
		After		4.1	4.1	18.4	10.2	38.8	24.5	6	5.49		1.37
	TG	Before	2.9		2.9	4.4	39.7	33.8	16.2	5	5.44	.07	1.20
		After		1.5	4.4	7.4	33.8	33.8	19.1	5[a]	5.51		1.11
a. Multiple modes exist. The smallest value is shown													

Source: Author's elaboration, 2019

Innovation can manifest itself in areas of product/service quality, leadership and decision-making, relationships management with customers and other stakeholders, etc. In the perspective of innovation in this study, the highest differences in the means were recorded in indicators related to value of achievement than money (1.58 in TG and 0.55 in CG). While "thinking on novelty" registered 1.08 difference in the means in TG, this indicator recorded 0.25 in the CG. Respondents in CG also showed high interest in experimentation which registered 0.59 compared to almost no progress in TG (0.07). Initially, the mean averages show that respondents were not decisive on what to choose between achievements and money but after the training they had changed their perceptions in favor of achievements. Depending on the circumstances, an individual performance can be recognized and/or praised in accompaniment with pecuniary reward or without. However, as achievement and money are sometimes inseparable, trainees should always be informed that money follows the action, and the better the action the higher the probability of monetary value in return. Generally, all groups' results show that they were attracted by creativity which recorded the highest mean averages before and after training.

5.2.2.5.Competitive aggressiveness dimension

With regard to competitive aggressiveness, four indicators were assessed including: commitment to seeking new opportunities, resilience until the idea becomes a reality, continued trials no matter the number of failures in the process and, happiness or comfort in a leading position. For effective competitiveness an entrepreneur needs to keep trying (new products, markets, processes etc.), lead the market where possible or be among the market leaders.

Results in the table 34 show that in the CG the indicator of seeking new opportunities registered the highest progress (0.53) and the highest mean averages before as well as after the training (with 5.76 and 6.29 respectively). Another quick observation shows that there is a sharp contrast between results in the CG and TG. The indicator "rarely give-up until ideas become reality" recorded 0.02 and 0.87 differences in CG and TG respectively. Two indicators recorded negative differences in the means in the CG while they were positive in TG. Such indicators are "continued

trials no matter the number of failures" with differences of -0.75 in CG and 0.73 in TG, and "happiness in a leading position" with -0.67 in CG versus 0.46 in TG.

Table 34: Competitive aggressiveness

Variable name	Group	Period	Responses in percentages							Mode	Mean		SD
			Rating scale										
			1	2	3	4	5	6	7			Δ	
Always seeking new opportunity	CG	Before				10.2	32.7	28.6	26.8	5	5.76	.53	.99
		After				4.1	16.3	26.5	53.1	7	6.29		.89
	TG	Before			4.4	10.3	14.7	44.1	26.5	6	5.78	.29	1.09
		After				4.4	23.5	32.4	39.7	7	6.07		.90
Rarely give-up until ideas become reality	CG	Before			2.0	14.3	40.8	30.6	12.2	5	5.37	.02	.95
		After		6.1	6.1	4.1	30.6	32.7	20.4	6	5.39		1.36
	TG	Before	1.5	4.4	13.2	14.7	17.6	27.9	20.6	6	5.09	.87	1.56
		After		5.9	4.4	2.9	13.2	22.1	51.5	7	5.96		1.46
Keep trying despite failures	CG	Before			4.1	6.1	30.6	38.8	20.4	6	5.65	-.75	1.01
		After	2.0	8.2	12.2	12.2	20.4	30.6	14.3	6	4.90		1.61
	TG	Before	7.4	7.4	10.3	5.9	25.0	29.4	14.7	6	4.81	.73	1.78
		After		2.9	5.9	8.8	22.1	36.8	23.5	6	5.54		1.27
Happy/ comfortable in a leading position	CG	Before				16.3	28.6	34.7	20.4	6	5.59	-.67	.99
		After		12.2	8.2	16.3	24.5	16.3	22.4	5	4.92		1.64
	TG	Before	1.5	2.9	4.4	8.8	22.1	36.8	23.5	6	5.51	.46	1.35
		After		2.9	5.9		19.1	26.5	45.6	7	5.97		1.29

Source: Author's elaboration, 2019

While students may like experiments in their daily learning atmosphere, it might be difficult for them to keep trying despite failures encountered in the trial process in real market. It should also be remembered that market-oriented trials need resources (skills, time, money, infrastructure…) and such resources might be difficult to get for a student. But one can ask why in the CG, they are not feeling comfortable in a leading position? An attempt to answer this question looks back to the lower self-appreciation in matters related to market and business talks. It can be understandable that if people are not open to talk about market and business and cannot sustain trials, it is (relatively) understandable that they will not feel comfortable in a leading position due to insufficient knowledge/skills about them or because they cannot sustain it. Another explanation can be that students fear to be in a leading position not because they don't like challenges associated to it, but because they were not exposed and accustomed to such status earlier on. In this line of argument, participants in the CG followed a teacher centred approach which consisted of explaining theories and tools, demonstration of business planning processes that they applied to their business ideas. This approach limits, to some extent, the exposure of students to hot issues

that real entrepreneurs face in their daily life. The TG followed a participatory learning and action approach which requires direct involvement and contact with the main market actors- consumers and producers. It therefore sharpens and influences the understanding and mindset of students. They reflect on various strategies heard and seen from the field and find out their best way to advance their business ideas. When interacting with market actors, students are also able to observe emotional attachments to one's business. Without being too conclusive, respondents in the TG demonstrated high self-appreciation in the dimension of competitive aggressiveness on one side and improved their entrepreneurial-like-thinking in the same dimension on the other side.

5.2.2.6. Summary of the descriptive findings

The above descriptions looked at percentages and mean averages at indicator's level. The following description considers summaries of the mean averages at the dimension level. The table displays the mode, mean and standard deviations in CG and TG before as well as after trainings.

Table 35: Summary: Descriptive statistics by dimensions

Dimension	Period	Control Group (N=49)				Treatment Group (N=68)			
		Mode	Mean		SD	Mode	Mean		SD
				Δ				Δ	
Risk-taking	Before	6.50	5.71	.55	.78	5.75	5.43	.48	.87
	After	6.50	6.26		.42	6.25	5.91		.69
Pro-activeness	Before	5.33[a]	5.44	.34	.87	5.00[a]	5.36	.31	.83
	After	6.50	5.78		.72	5.67[a]	5.67		.68
Autonomy	Before	3.25[a]	3.67	.18	1.59	4.75[a]	4.01	.44	1.16
	After	2.50[a]	3.85		1.52	4.25[a]	4.45		.98
Innovativeness	Before	4.40	4.77	.43	.98	5.00	5.00	.60	.85
	After	6.00	5.20		.94	4.60	5.60		.75
Competitive aggressiveness	Before	5.75	5.59	-.22	.73	5.50	5.29	.59	.97
	After	5.50[a]	5.37		.93	6.20	5.88		.77
a. Multiple modes exist. The smallest value is shown									

Source: Author's elaboration, 2019

Looking at the mean averages in the table above, it is observed that all dimensions registered positive differences in the mean averages after the training both in the control and treatment groups except the dimension of competitive aggressiveness which recorded negative differences in the control group (-0.22). One can also observe that the differences between the means in dimensions of autonomy, innovativeness and competitive aggressiveness are higher in the treatment group than in the control group. On the other side, risk-taking and pro-activeness had higher progresses in the control group (0.55 and 0.34 differences respectively) than they had in the treatment group (0.48 and 0.31 differences respectively). It is also noticeable that these two

dimensions had the highest mean averages before and after training in both groups. While the margin of differences recorded in pro-activeness for both control and treatment group is very small (0.34 vs 0.31), the margin between the two groups in terms of autonomy is relatively high (0.18 vs 0.44 respectively).

On the autonomy, despite that this dimension recorded the lowest mean averages in both control and treatment groups, some positive changes in the respondents' mindset have taken place. General comments could be that respondents were still fearful about self-dependency because when they are in school they enjoy safe and stable environments and almost all disturbing conditions are in control. They are protected and taken care of by the parents, school or somebody else for daily survival. Their beliefs in chances to get jobs after graduation are still high etc. Another justification could be that, based on the local experiences, many people who created own businesses started by working for others, made some savings before they created their own life. Students may think that using the same strategies can work for them as well. This mindset bears negative consequences that relegate autonomy at the last choice. Nevertheless, a deep analysis into the matter can discover other realities which are linked to market conditions (financial accessibility or lack of start-up capital, competition, imitation, small market size, etc) and the learning conditions (weak R&D policies; insufficient schemes for supporting entrepreneurial learning -tools and equipment; much value to traditional teaching approaches than to new ones...).

Having described statistical results from the two groups in all indicators and dimensions before and after training; after showing that some progress in entrepreneurial-like-thinking were recorded in some areas and not in others, it is necessary to assess whether such changes make statistical significance for effective conclusion. We use Mann-Whitney U test for that purpose.

5.2.3. Mann-Whitney U test results

As earlier explained, the Mann-Whitney U test is based on the comparison of each observation from the first group with each observation from the second group. It is a test of the probability that an observation from one group will be higher than an observation from the other group. It can be used to answer the questions of the researcher concerning the difference between two independent groups. It should also be recalled that the control group received training in Business planning while the treatment group received a New action-oriented training module. A comparison of the results is done to show the statistical significance of changes in respondents'

personal entrepreneurship characteristics before and after training. The following tables display the answers for each group: first, by indicators; second, by dimensions for a summative comparison.

5.2.3.1.**Mann-Whitney: Risk-taking**

By comparing risk-taking indicators, it emerged that in the control group a Mann-Whitney U test showed significant differences in the means before and after training for three out of four indicators: exploring new areas (U = 907, p = .027), choosing profitable opportunity but with risky alternatives (644.5, p = .000), and doing things differently (U= 766.5, p = .001). Only confidence in own ability to succeed did not register significant statistical difference in the mean (1023, p= .173).

Table 36: Mann-Whitney U results- Risk taking

Risk-Taking	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Exploring new areas	907.0	.027*	1366.500	.000*
Choosing profitable but risky opportunity	644.50	.000 *	1677.500	.005*
Doing things differently	766.50	.001*	1757.000	.013*
Confidence in own ability to succeed	1023.00	.173	1696.500	.005*
*significant if p < .05 level				

Source: Author's elaboration, 2019

On the other side of Treatment group, a Mann-Whitney U test showed that there was a significant difference for all four indicators. One can conclude that the two modules had positive influence on students' entrepreneurial thinking in terms of risk-taking, with the new module having a relatively small advantage on the business planning.

5.2.3.2.Mann-Whitney: Pro-activeness

In terms of pro-activeness, a Mann-Whitney U test showed that there was a significant difference between the means before and after training for three out of six indicators in the control group: developing healthy relationship (U = 862, p = .010), talking business often (U= 842.5, p=.009), and taking initiatives (U= 733, p= .001). It is observed that students made significant progress in such characteristics whereas no significant changes were observed in the remaining three indicators after training.

Table 37: Mann-Whitney U results- Pro-activeness

Proactiveness	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Establishing new relationships	1163.500	.779	2005.000	.157
Developing healthy relationship	862.000	.010 *	1974.500	.105
Being the first to the market or imitate	1160.500	.772	1430.000	.000*
Talking business often	842.500	.009*	2075.000	.295
Taking initiatives	733.000	.001*	2162.000	.500
Commitment to achieving own goal	1129.000	.584	2107.500	.347
*significant if p < .05 level				

Source: Author's elaboration, 2019

However, significant change in the treatment group happened only in the indicator of being first to the market or to imitate as the Mann-Whitney U test shows (U= 1430, p= .000). That also means comparison of results before and after training for other indicators showed no significant changes occurred. While we associate the significant changes observed in the three indicators of the CG to the comprehension of the importance of linkages between market and working requirements, the change observed in the TG can be attributed to the physical interactions between students and entrepreneurs during market/product appraisal.

5.2.3.3.Mann-Whitney: Autonomy

When checking Mann-Whitney U test results for all indicators in the control group, no statistically significant difference between the means before and after training was registered. This is not the case on the side of treatment group because a Mann-Whitney U test showed that there were significant differences in two indicators: self-direction in pursuing opportunity (U = 1539.5, p = .001), and lack of worry to leave a secure position for new field (U = 1862, p = .047). These changes can be attributed to the interviews with entrepreneurs and their experiences of how they managed to start and sustain the business that they shared with students.

Table 38: Mann-Whitney U results- Autonomy

Autonomy	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Self-direction in pursuing opportunity	1065.000	.330	1539.500	.001*
Ability to function independently	1111.500	.522	2026.500	.208
Rare dependency on others for task execution	1139.500	.658	2124.500	.408
Not worried to leave secure position for new field	1174.000	.849	1862.000	.047*
*significant if p < .05 level				

Source: Author's elaboration, 2019

Based on these results, changes in the perceptions about autonomy are possible although not likely to happen to students at large. Given the education ecosystem in which they perform, such ecosystem is dominated by high dependency in many occasions. It is structured in such a way that students find themselves at the campus eight hours, five days a week. Such time plan makes them concentrate on their lectures with very little possibilities to do something different after class (income generating). Even when someone might be willing to do something, it is a bit difficult to get evening jobs because there are no such opportunities in the neighbourhoods. However, students in the treatment group understand that no matter the difficulties, successful personalities (must) have develop(ed) self-confidence in pursuing opportunities to the extent of leaving secure positions for adventuring into something unknown. The statistical significance registered in the TG and not in CG can be linked to the interaction students held with entrepreneurs (invited to talk to them in class and in the market field) whereby they were invited to carefully listen and identify individual motivations, experiences as well as market strategies.

5.2.3.4.Mann-Whitney: Innovativeness

A Mann-Whitney U test showed that there were two out of five indicators in the control group which recorded statistically significant differences between the means before and after training. Value of achievement than money (U = 926.5, p = .048) and having interest in experimentation (U = 904, p = .031). In the treatment group, the Mann-Whitney U test showed that there was significant difference for value of achievement than money (U = 1272, p = .000) and another one related to thinking on novelty (U = 1292, p = .000). While "often thinking on novelty" recorded significant changes in the TG and not in CG, the situation can be attributed to the training materials that pushed students to use different strategies for product or service value creation and tracking.

Table 39: Mann-Whitney U results- Innovativeness

Innovativeness	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Attracted by creativity	990.500	.125	1996.000	.151
Value achievement than money	926.500	.048*	1272.500	.000*
Supporting new ideas	1035.500	.227	2206.500	.630
Often thinking on novelty	1045.500	.262	1292.500	.000*
Having interest in experimentation	904.000	.031*	2255.000	.794
*significant if p < .05 level				

Source: Author's elaboration, 2019

From these results, both groups have registered statistical significance in terms of valuing achievement than money. This is an indication that students came to differentiate between achievement and its value (which is logically the source of money) from money (which can be used as a measurement of achievement among others). For aspiring entrepreneurs, the tendency to immediately jump to the money can be judged normal but once exploration of various sources of money is done, changes in the initial mindset are noticed. On the other side, respondents in the control as well as treatment group registered insignificant statistical differences in supporting new ideas (U = 1035.5, p = .227) and attraction by creativity (U= 990.5, p = .125). One can assume that there is relatively no change in the initial position.

5.2.3.5.Mann-Whitney: Competitive aggressiveness

In four indicators for this dimension, the Mann-Whitney U test shows that keeping trying despite failures in the process recorded significant differences between the means in both groups (U = 902.5, p = .029 and U = 1790.5, p = .015 respectively). However, they did not in "seeking new opportunities" (U = 836, p = .006) which was significant in the CG only. Rarely give-up until ideas become a reality (U = 1489, p = .019) and happiness in a leading position (U = 1777.5, p = .015) were significant in TG only too.

Table 40: Mann-Whitney U results- Competitive aggressiveness

Competitive aggressiveness	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Always seeking new opportunities	836.000	.006*	2001.500	.154
Rarely give-up until ideas become reality	1092.500	.423	1489.000	.000*
Keep trying despite failures	902.500	.029*	1790.500	.019*
Happy/comfortable in a leading position	940.000	.058	1777.500	.015*
*significant if p < .05 level				

Source: Author's elaboration, 2019

Observations from the above results show that both groups recorded statistical significance in "keeping trying despite failures". The treatment group exhibits significant changes in three indicators whereas the control group does better in two out of four indicators. It is possible to argue that although students face challenges in finding out conducive environments where they can try their business ideas, they also find it useful to learn and grow from mistakes. It is argued that successful entrepreneurs are not those who shy away from challenges, rather those who are not deterred by failures encountered in the process of achieving their objectives. Furthermore, talking and listening to the practitioners in the market and observing what they do in the field

might have influenced statistical significances in the two indicators of "rarely giving up" and "comfort in a leading position" recorded in the TG. Such emotional and motivational vibrancy could not be much felt in the instructive approach used for the CG.

5.2.3.6.Mann-Whitney U test- summary of dimensions

The following summary presents results obtained through Mann-Whitney U test computed from average results of each dimension indicators before and after training.

According to the results, two out of five dimensions in the control group recorded statistical significance in the mean before and after training. Such dimensions include Risk-taking (U = 698.5, p = .000) and Innovativeness (U = 882.5, p = .024). In the case of treatment group four out five dimensions recorded significant differences. The dimension of Autonomy recorded insignificant statistical difference for both groups (U =1118, p = .557 for control group and U =1866, p = .052 for treatment group).

Table 41: Mann-Whitney for the EO dimensions

Dimension name	Control Group (N=49)		Treatment Group (N=68)	
	Mann-Whitney U	Asymp. Sig. (2-tailed)	Mann-Whitney U	Asymp. Sig. (2-tailed)
Risk-taking	698.50	.000*	1501.50	.000*
Pro-activeness	947.50	.071	1841.00	.040*
Autonomy	1118.00	.557	1866.00	.052
Innovativeness	882.50	.024*	1397.00	.000*
Competitive aggressiveness	1080.50	.391	1486.50	.000*
*significant if p < .05 level				

Source: Author's elaboration, 2019

From the table 41, three important observations can be made:

- First, students in both groups recorded significant changes in two dimensions including risk taking (U = 698.5, p = .000 for control group; U = 1501.5, p = .000 for treatment group) and Innovativeness (U = 882.5, p = .024 for control group; U = 1397, p = .000 for treatment group);
- Second, students in both groups did not record significant changes in the dimension of Autonomy (U = 1118, p = .557 for control group; U = 1866, p = .052 for treatment group);

- Third, two dimensions of pro-activeness and competitive aggressiveness recorded mixed results. While the Mann-Whitney U test results show insignificant statistical differences for both pro-activeness (U = 947.5, p = .071) and competitive aggressiveness (U = 1080.5, p = .391) in the control group, statistical significant differences were recorded on the other side of treatment group: proactiveness (U = 1841, p = .040) and competitive aggressiveness (U = 1486.5, p = .000).

Considering results of the dimensions and indicators as presented in this chapter, it is evident that both training modules had certain positive effects on learners' personal entrepreneurship characteristics. While 18 out 23 indicators in the CG recorded positive changes in the mean averages before and after training, the TG recorded positive changes in 21 out of 23 indicators. Inferential statistics shows that 10 among the 18 indicators in the CG were statistically significant compared to the 12 among 21 indicators in the TG. Such effects are testimonies that entrepreneurship education certainly affects learners' entrepreneurial orientation. The number of dimensions/indicators and their levels of significant or insignificant differences also gives the light on the effectiveness of the training modules provided to the groups. It was observed that the new training package induced significant changes in 4 out of 5 EO dimensions while the existing module influenced 2 out of 5 dimensions. It is therefore important that these ground results are discussed in connection with the scientific literature (chapter 6).

5.3.Trainers observations

In this research, observation was also used by trainers to collect some qualitative data. First, it considers opinions collected during the interviews with HoDs and Class representatives, introduction of the course, and collection of students' learning expectations. Second, observations made throughout the training process. Module leaders had to check and assess the behaviour of learners during the learning process, identify learning preferences, tendencies as well as challenges. Thereafter, similarities and differences between the CG and TG had to be drawn.

5.3.1. Observations based on opinions and expectations of program managers and students.

5.3.1.1.What motivates students and academic managers for entrepreneurship

Driven by the public rhetoric that entrepreneurship and innovation are key to success, students had the curiosity of knowing how to be innovative, how to utilise their skills for personal career success. Another key point shared among students and heads of departments is linked to the threat

of unemployment after graduation. Such a threat is amplified by the public authority which keeps calling academic institutions to adopt new teaching habits that increase the potential for producing ready-to-work graduates. The call for shifting from theoretical to applied education followed by changes in curricula makes everyone feel concerned about his/her future. The nature of science disciplines that students follow is by far practice or field oriented but the teaching approaches and learning environments are not supportive enough in that sense. Students want to implement what they learn and be successful in the market. However, they lack market attachment that supplements laboratory basic skills and experiences.

It was also observed that teaching entrepreneurship was not an internally generated decision as it was introduced in all educational institutions across the country following government's recommendation. Being a recommendation itself is not an issue but rather how it must be implemented in both private and public institutions plus supportive measures. In the third pillar of "Rwanda's vision 2050" related to "transformation for prosperity", the government aims at "increased productivity and competitiveness while providing jobs for Rwandans". Entrepreneurship is therefore at the centre stage for turning the country into a knowledge-based and competitive economy. On one side, compliance with national policies is a requirement for all concerned entities and in this context HEIs should liaise with the government for the common good. On the other, accountability of the academic managers is evaluated through the performance of students at school and after graduation (especially employment rate of university graduates in 1-2 years after they left the institution). Therefore, teaching entrepreneurship becomes another government's tool for community outreach as well as universities' channel to increase institutional visibility.

In a nutshell, a closer look at the motives of teaching entrepreneurship in Rwanda reveals another reality that confirms what Hope (2016) and European Commission (2010) argued. Entrepreneurship is not just a tool for teachers and researchers, it has become a tool for organizations and governments to implement changes in different societal systems. Unfortunately, such directives are not always or immediately followed by means for implementation; a situation that leaves many implementers struggling in the change process.

5.3.1.2.What to focus on in teaching entrepreneurship

Both science students and heads of departments understood entrepreneurship as of how to start a business and make profit in general. In our discussions, business planning was the major preference, then innovation and, finally, making money (how to raise money and make profit). During the discussion of expectations, students in both CG and TG wanted to hear much about how to plan and raise money. When checking such feedbacks, it was noticeable that the classical entrepreneurship (that is centred on business planning) was the type of course they were looking for. Their choices can be justified by the fact that business planning is the dominant type of training provided to both academic and non-academic customers locally. It is a common practice whether it is done by the private sector, non-governmental organizations or academic institutions. For the respondents, interest in business planning was influenced by marketing reports about such trainings. On top of that, trainings in business planning have been delivered to the campus and surrounding communities by the incubation centre of the institution. Although entrepreneurship is generally about that, it is more than just creating and making money. It is about personality, behaviours, attitudes and competences, etc. (QAA, 2018) which are developed whenever individuals get involved in market-oriented activities.

On the aspect of innovation, different local players (mostly public authorities) have been sensitizing the private sector to invest in innovations for becoming more competitive at national and regional markets. In public lectures students are encouraged to become innovative in their plans and activities as well. Though discussed to a great extent with students when encouraging them to look for value addition in whatever they do, innovation remains largely theoretical due to insufficient resources and lack of appropriate environment (infrastructure, human, financial, technological resources, etc). Given the number of students looking for skills, technical support or using HEIs resources, available resources in HEIs cannot cultivate a culture of creativity and innovation. It requires a combination of investments in research and development as well as an improved ecosystem for entrepreneurship education. This would certainly increase competences in thinking and acting for both students and academic staff.

5.3.2. Practical challenges in delivering the courses

It was mentioned that the entrepreneurship module at INES-Ruhengeri was common to students in social sciences but not to science major students. As a new module introduced in the curricula,

information about its content was limited and vague to the learners. Before starting the course, expectations were collected and analysed.

- First, many students in CG and TG groups thought it was about teaching how to start a business coupled with how to finance it. In theory of learning it is easy to understand this because there is no business without financing mechanisms. However, in practice students expected that the teaching activity will go along with finding financiers who will immediately support them to implement their business ideas (expectancy theory). For students nearing graduation, entrepreneurship meant starting own business. It was discovered that students were expecting some start-up capital after training (through connections) in order to execute their projects. In seeking to know why they had such expectations, we discovered that some few years back at the campus, a small group of alumni went through the incubation centre's training and supporting schemes and was supported in implementing their business projects with little fund. They were therefore expecting similar benefits as this was, for them, a precedent. In order to eliminate this challenge, students were promised to get introduced to and linked with the incubation centre for further coaching and mentorship in developing their business ideas.
- Second, in association with the funding opportunity (unplanned in this case), each student initially considered his/her business idea to be good and implementable. Although this feeling is common in entrepreneurship trainings at the beginning, the love and attachment to own idea appeals for commitment and engagement in the pursuit of every other step related to it. Consciously or unconsciously there is a certain spirit of competitiveness among participants and it can be open or latent. Once the idea is not selected to be worked on in groups, the motivational factor makes some individuals deploy fewer efforts than required. This is much felt when students are given assignments demanding data mining (especially secondary data in business planning) and when the individuals already had limited knowledge about the subject matter. This challenge is eliminated through coupling ideas with close similarities. The one whose idea was not selected will be attracted by similarities and will try to pay attention to the "why" and "how" things s/he can apply to his/her case are done as such.

  Students in the CG faced difficulties in finding out reliable publications that could support the development of their group ideas in reference to the local market sectors. Library and

internet searches could provide a basis for reasoning but not providing the needed genuine information that legitimises the business planning processes in the local context. It was also observed that they had high interest in knowing planning processes but were surprised by how complex and time demanding it is. The TG was characterised by long discussions and assumptions especially in the components of value proposition. A good number of students could come back to ask trainers typical questions and options related to their personal business ideas (which were not selected).

- Third, building on the second point one could expect parallelism between own idea and group ideas. Parallelism can be good as it makes individuals multiply efforts in order to understand and participate in group assignments (a good sign of sympathy vis-à-vis entrepreneurship world), but it can also slow down the pace of both group and individual learning. When dealing with group assignments in business planning, the rationale is to have everybody concentrating on the group idea. However, when group members take the break before completing the task, they are requested to seek supplementary information and complete the task before the next day's meeting. The purpose is to help the learners come closer to market realities, with facts as publications proved they happen in their field. It is obvious that some students will like to work on their typical ideas and leave out the collective idea. When they meet again in the following session one finds that group members are not on the same page. When such parallelism happens, some measures can be taken including individual task assignment among group members, setting small group award, and/or proper time management to limit the likelihood of concentrating on individual cases.
- Fourth, in business planning, predictions are based on factual market analysis (political, economic, social-cultural, and technological). It is known that the details of a plan help to legitimate the new business because market evidences prove whether the concept is feasible and viable or not. Individuals are forced to gather information about their industries and stakeholders, and this does not only contribute to greater knowledge alone but also better understanding of the business environment (Frese and Gielnik, 2014). However, it may be practically difficult to handle market sectors with less or without documentation. Students may check and collect information from the internet, but the data may not apply to the local market environment in which the business idea has to apply. Although students can proceed with and rely on primary data, this situation may render

the business planning a bit complicated and make learners feel unsympathetic with the process. When such a situation occurs, students are advised to carefully understand the data in their typical context, compare them with the primary data and try to adapt to their local situation.

In the TG, data collection was a bit easier, flexible and straightforward as students had to spend much of their time interacting amongst them to understand the concepts/tools and applying them, discussing with entrepreneurs or buyers in the field for getting the practical market realities. In markets, students found it difficult to obtain sensitive data especially from well-established businesses compared to small start-ups. Though it is frustrating for students to some extent, this experience is not bad for the learning purposes. It is rather informative about what learners may face in their entrepreneurial or intrapreneurial careers.

- Fifth, coaching science students' projects requires not only the understanding of the business concept but also some technical and practical aspects of the product/service ideas. This means in case the business idea falls within students' disciplinary knowledge/skills, coaching can be time consuming; it may need parallel or double coaching: one in business skills and another in technical aspect. It may require laboratory tests which need to be done by an expert in that aspect and paid for, etc. For helping students to link their education with market needs via entrepreneurship education, the learning objectives should be well aligned with the learning approaches and means.

6. CHAPTER SIX: DISCUSSION OF FINDINGS

In the previous chapters we elaborated and discussed the importance of entrepreneurship education in developing students' entrepreneurial orientation which serves both entrepreneurship and employability purposes. The main goal for entrepreneurship education in this study was to develop learners' entrepreneurial-like thinking and competences and not venture creation. As Peter Drucker (1985) argued, entrepreneurship is neither a science nor an art, it is a practice. It has a knowledge base, but as in all practices... knowledge in entrepreneurship is a means to an end. He argues that what constitutes knowledge in a practice is largely defined by the ends, that is, by the practice. Looking back again at the process of teaching entrepreneurship and its interplay with employability, we find that entrepreneurial education as defined by Middleton & Donnellon (2014) intends to prepare individuals for engagement in an entrepreneurial process (one could say an entrepreneurial career), thus requiring development of entrepreneurial competence which involves Knowledge: Know What, Skills: Know How, and Attitudes (values and behaviour): Know Why.

The concept of knowledge, which is very important in entrepreneurship development, is defined by Van Daal et al. (1998) as the capacity that enables someone to perform a particular task**.** It is something that exists in the mind of peoples, which makes it complex, unpredictable and difficult to capture. Van Daal et al. (1998) classify it into implicit and explicit knowledge and the difference between them is not entirely clear. Using the formula K= I*ESA, they justify knowledge as a function of Information, Experience, Skills and Attitudes whereby K = Knowledge, I = Information, E = Experience, S = Skills, A = Attitudes. While Information is related to explicit knowledge, which can be codified and further elaborated in for instance documents, theories and manuals; Experience, Skills and Attitude are related to implicit knowledge. Experiences (knowledge obtained through discovery or observation) are personal and can be divided into feelings, associations, fantasies and assumptions. Skills (dexterity, adroitness, competence) represent traditional/manual skills, analytical and communication skills, intuitive skills etc. Attitude (characteristic of a person in a particular situation) is also personal and is characterized by norms, values arising from basic assumptions that determine the behaviour/actions of a person in a given situation.

As mentioned above the classification of knowledge considers two important categories: explicit and implicit knowledge. Explicit knowledge (information) involves codified knowledge;

information formulated in theories, formulas, procedures, manuals etc.; transfer through education; attainable through study in teaching process; and cannot be used as power. Implicit knowledge (experience, skills and attitudes) involves tacit knowledge; experience, skills and attitude; shared through demonstration, attainable through imitation in socialization process; and can be used as power (van Daal et al., 1998, p.256). It is argued that the transfer of explicit knowledge is relatively easier than implicit knowledge (Van Daal et al., 1998).

In this chapter the discussion of the results builds on the influence that the explicit and implicit knowledge through entrepreneurship education had on students' entrepreneurial orientation (thinking and acting). Four important aspects are discussed in connection with the hypotheses and objectives of the study**.** They include the relationships between the taught EE modules and students' EO and to what extent the modules:

1. have activities that seek clearly to develop knowledge, skills and attitudes/behaviours
2. help students to 'feel' the world of entrepreneurship
3. seek to inculcate and create empathy with key entrepreneurial mindset values (EO)
4. Motivate students to entrepreneurship or intrapreneurship career.

6.1. EE and EO: knowledge, skills and attitudes/behaviour development

In this study, the first hypothesis states that "there is a positive relationship between the taught entrepreneurship education modules and students' entrepreneurial orientation". While checking descriptive statistics, results demonstrated that 18 out 23 indicators in the control group recorded positive changes in the mean averages before and after training compared to 21 out of 23 indicators in the treatment group. Such effects are testimonies that entrepreneurship education through business planning and action-oriented module certainly affected learners' EO in a positive way. However, it should be remembered that changing attitudes and behaviours of individuals takes time thereby implying that short term trainings try to influence intentions and actions in the short run. In academia, such results help to evaluate the training content and pedagogies but also to have expectations that skills and competences acquired by learners will be utilised in the market.

Teaching entrepreneurship and processes of successful entrepreneurship can be done in theory (explicit entrepreneurship) and seems easier than learning entrepreneurship in practice (implicit entrepreneurship). Pouspourika (2018) argues that some people believe entrepreneurship skills

can be taught at higher education institutes and high schools; others believe that entrepreneurship can only be taught to people by other entrepreneurs who have practical experience on the field; and finally, people who believe that entrepreneurship cannot be taught by someone, it is something that every entrepreneur can learn only while doing it (i.e. personal experience). Following this argument that entrepreneurship can be taught, the teaching process or approach should allow people to know the extent to which taught programs have activities that seek clearly to develop behaviour, skill and attitude of the target group. In other words, the teaching should cover the knowledge of what needs to be done, the knowledge for performing entrepreneurial activities and the knowledge that sustains personal engagement and legitimizes action (Middleton & Donnellon, 2014).

In this spirit of developing and transferring entrepreneurial knowledge, skills and behaviours, the learning process in our research dealt with both explicit and implicit knowledge. They are explained here as functional or managerial skills and personality skills. The learning involved codified knowledge (entrepreneurship modules) to facilitate the reading, understanding of concepts, principles and processes of starting a business; used demonstrations (filling the forms, canvases…) and imitation (action or behaviour) in a socialization process that took place in a real or simulated environment (in-class performance or talks to entrepreneurs in the field). Theory and practice were intertwined and depending on the target group there were some variations in the emphasis of learning. In the control group, the knowledge transfer was largely dominated by explicit knowledge (Know what and the functional steps to take) while the implicit component of the knowledge was dominant in the Treatment group (know what and how to carry out the steps in the most efficient and effective means possible, given the skills, strengths, and values, among other particularities, of the individuals).

Like in any type of education, the learner had to understand the topic first before applying the knowledge and skills. The application was meant to prove whether the subject was well understood at a certain level or not. By defining and describing the subject matter, not only the knowledge was created but also the scope of understanding was expanded which gave room to different scenarios of knowledge evaluation. Additionally, the knowledge transmission approaches utilized in both the control and treatment groups involved a mix of methods/ techniques. They included iterative, interactive and reflective methods; some at individual levels others at group levels. The use of different tools including forms, canvas, and checklists also

became an opportunity for students to learn and familiarize with business training materials which they can use in other environments including employment.

In brief, students learned how to be organized, how to structure business ideas and how to be process oriented (dominant in the control group); they also learned how to think creatively, act proactively and think competitively (dominant in treatment group). In this process of learning and personal development, students learned how to identify and evaluate a problem or a challenge (business opportunity or gap). They came together to exchange (with or without the facilitator), support and challenge each other (as peers) in the spirit of action and learning. In their groups or individually, students learned how to tackle important organizational or social challenges. They also learned from their attempts to improve things (Pedler & Abbott, 2013). They followed Revans moral philosophy for action learning that involves: honesty about self, starting from ignorance (from not knowing in order to find fresh questions), action as imperative for learning (not just thought), in a spirit of friendship and, for the purpose of doing good in the world (Pedler, 2016).

6.2.EE and EO: Creating empathy with the entrepreneurial life

This point looks at what degree the program activities created amongst students the ability to identify and understand entrepreneurs' feelings or difficulties. In our results, the background of respondents showed that the majority were still young (mostly less than 25 years old), they studied programs which were not business oriented, and lived or grew up in locations or environments which were not sound in entrepreneurship. Such backgrounds put them in a relatively weak position for understanding what happens in the field of entrepreneurship.

Additionally, opinions collected during pre-training interviews from Heads of Departments and class representatives were in favor of teaching entrepreneurship. That is because, before or after graduation, students are confronted with market uncertainties (ex. unemployment) which affect their survival negatively. In this fight for survival, it is believed that teaching students how to create and manage a business contributes to self-reliance (self-employment) in the future. Entrepreneurship can be utilised as a soft means to challenge and change students' general mindsets that someone else has to employ them even when they have evidences that there are few opportunities for employment. The continued growth of the number of university graduates and the high rate of graduates' unemployment demonstrated that many young graduates without jobs

have become a burden to parents and government, and therefore they should be sensitised and supported to create jobs for themselves. Decision-makers believe the university is the best place to be for developing such entrepreneurial competences. Thus, not only such competences can help graduates to create own jobs and give jobs to others (entrepreneurship) but also inspire graduates to work for established organizations effectively (intrapreneurship). With that in mind, graduates contribute directly or indirectly to self or organizational development and reduction of unemployment at large.

Still in this spirit, different approaches were utilized to make students feel what happens in the world of entrepreneurship. They were introduced to different content materials such as Business plan which offers different advantages including comprehensive image of the whole activity of a company, making easier to run the business, offering the possibility to evaluate new ideas and projects and allowing communication with different current or potential partners such as suppliers, clients and financers. Students were also involved in competition analysis where they learned to identify who their key competitors are (direct and indirect), develop a profile for each of them (and their customer profiles), identify their objectives and strategies, assess their strengths and weaknesses, gauge the threat they pose, and anticipate their reaction to competitive moves. They learned about market and marketing research in order to identify and define markets; customer needs, wants and demands; understand market offerings (products, services and experiences); customer value and satisfaction; and exchanges and relationships. They were informed that firms that develop systematic and advanced competitor profiling have a significant competitive advantage, therefore, they have also to strive for better customer profiling. In other words, the content materials and associated activities delved learners into the scanning and understanding of the business environment, factors and actors for effective performance in their typical local context. These are key elements as also discussed in the works of Ciumara (2010), Cuellar-Healey & Miguel (2013) and Harris (2013)

Feeling the world of entrepreneurship requires a certain level of pro-activeness and competitiveness. In the results, there was a general observation that business and market related indicators recorded the lowest mean averages before and after training and respondents (though progressive in some indicators) had not developed solid confidence in such areas in both control and treatment groups. This was not the case for indicators related to building and maintaining strong relationships which recorded relatively better mean averages; and the eagerness to seeking

new opportunities that was highly rated in both groups. In the contexts of pro-activeness and competitiveness which are believed to increase the interaction levels between entrepreneurs (aspiring or existing), two approaches were used:

- First, class discussions with illustrative examples after which students in groups had to find out themselves information related to their typical business idea, and fill the information using a standardized form, presentation of the business plan in class for feedback (Control group);
- Second, explaining the instrument for data collection (interview guide) in class, invite an entrepreneur for an interview and send students in the market for data collection, presentation of results using canvases and other visual representations (market mapping and path) and get feedback from the class (Treatment group). By so doing, students were invited to draw simultaneously on the product value chain in a lesser complicated manner and in short-time (draw linkages between players, value addition (from A to B to C) in a more quantitative representation). Where possible, students had to identify two entrepreneurs of different sizes in the same sector and were invited to identify and differentiate between their market strategies (offensive and defensive).

Interviewed program managers and class representatives argued that it is worth teaching entrepreneurship to science major students because of two major advantages: first, there are better career prospects for science students who combine business skills with disciplinary skills. They believed that if students were exposed to market realities for understanding and feeling how markets operate, they could change their perceptions regarding the relationships between academic studies and (business) career. Second, they believed that once the training is over, possibilities for implementing business ideas could have increased too. This could be observed in competencies of developing business plans, budgeting and financial planning, applying tools for market assessment, etc. Results of this study show that in all groups some considerable progresses were registered in terms of opportunity seeking, taking initiative, and market talks.

The goodness of bringing students closer to the market realities is that they see and feel how easy or complex things are, learners get the opportunity to observe and reflect on situations in and outside the comfort zone (school environment). Though convinced that entrepreneurship has some advantages for students, some levels of scepticism could be identified as well. At the beginning of the training, doubts from land survey students were linked to the fact that the market for land

surveying is too small, is government dependent and/or somewhat oligopolistic; contracts are executed mostly by bigger national and/or international companies and most of alumni students get employed by such bigger players. Majority of graduates in LS still have some windows for entering the employment market as employees, and their entry does not depend on business skills but rather on disciplinary competences. It was therefore relevant for the entrepreneurship module to teach them that, although the threat of unemployment seemed lower for them, they had to keep seeking new opportunities as the world of employment today is no longer the same as it was yesterday; technology changes are affecting the way people do business; employees with entrepreneurial skills are in a better position for recruitment in cases of equal qualifications, etc. Thus, instead of being reactive to environmental changes, aspiring workers must be proactive in seeking opportunities that enhance their creative skills (Studdard et al., 2013), be more entrepreneurially minded (Morris & Kuratko, 2002), and develop a certain level of alertness (Torres et al, 2017).

To feel the entrepreneurship world, the training tried to put students on the map of alertness as this factor constitutes a major entrepreneurial characteristic that interacts with other factors. Cuero Acosta et al. (2017) argue that successful entrepreneurs should have high levels of alertness in opportunity identification. Alertness works best in association with other factors such as expertise with managerial abilities to not only identify but also develop an opportunity, cognition, prior knowledge, social network, and the abilities of entrepreneurs to make it possible to clarify the opportunity and their scope (Webb et al., 2011). On top of this, students were reminded that alertness is closely associated with the level of risk taking and autonomy as these EO dimension require high levels of sensing, feeling and preparedness. To reach such higher levels, individuals need to be informed, but not only that, to be able to connect the dots.

In the process of identifying and exploiting an opportunity the difference between those alert and non-alert individuals is based on an individual's capabilities as well as personal characteristics including entrepreneurial alertness (Torres et al., 2017). But that alone cannot suffice, individuals should be able to scan the environment, evaluate the information and the opportunity itself for matching properly the needs that they observe with the scope of the opportunity. The matching of needs requires value creation and evaluation of resources which are needed to develop the opportunity at a certain level. Furthermore, value creation needs to be evaluated at each moment to generate higher gains for the entrepreneur. Thus, students were introduced to such market-

oriented practices and were recommended to always check the market trends, update their knowledge, skills and information for timely reaction.

In short, theories and practical examples facilitated learners to understand the linkages between entrepreneurship and disciplinary studies, process of how to create successful business and how to become self-reliant. Theory and practice came together to ease the learning experience, to shed light on how entrepreneurship skills can facilitate them to enter the market, and how to handle challenges of different natures (whether in self-employment or employment by other organizations).

6.3.EE and EO: Inculcating key entrepreneurial mindset values and attitudes

In our discussion of results, we argued that the new action-oriented module induced more statistically significant changes in entrepreneurial-like-thinking of students in the TG than in the traditional business plan module (4/5 and 2/5 dimensions respectively). This confirms the second hypothesis which states that "the new action-oriented module induces higher effects on students' entrepreneurial mindset values and competences than the traditional business plan". We showed that entrepreneurial values in the TG included risk taking, proactiveness, innovativeness, and competitiveness while the CG involved risk-taking and innovativeness. Autonomy registered insignificant changes in both groups. As these values are intertwined and are very difficult to dissociate from one-another, given that two variables of the same dimension with close similarity may get different appreciations not because they really differ but because one is probably not a priority in the moment (for ex. feeling ready to seek opportunities, build relationships but not ready to talk about market or become market leader); the following discussion tries to underscore the reasons behind this dichotomy in behavioral sciences.

Building on the previous literature about EO dimensions where different entrepreneurship values and contexts in which they apply have been defined, following the teaching of both modules to inculcate such values in students for good performance in market as firm owners or employees, this component comes back to reflect on students' perception of the development of own entrepreneurship values during the teaching process. How these values interact and influence each other, how they influence the individuals' perception of or by the society and what kind of intentions and actions do they generate or manipulate.

To begin with, in the behavioural theory, values are standards and principles that are accepted by the members of a society, mostly nested within attitudes and are related to cultural properties that lie behind attitude. Values affect attitude and attitude affect behaviours as well. In a market society, they reflect the thinking and behaviour of market players in the sense of "what is ethically acceptable and how it can be done". As values and society are two in one, individuals have to act in a way that is socially acceptable (following outlined social behaviours) and their interests should always be aligned within structures supported by the society. Not only values structure individuals' interests in every field of their lives and the courage for actions of their interests but also they are means of social control and pressure and they are the elements/factors of social process (Kalkan & Kaygusuz, 2012). In addition to that, if people assert that values are effective in determining the standards that guide individuals for their actions about their jobs in working life and in their plans to solve conflicts, business values are therefore instruments for motivation. They undertake the function of applying sanctions on individuals' actions (Ibid). Thus, in order for the business to succeed enterprises will have to align one's enterprise to personal, professional, and social values.

Having students learning the business mindset, principles and processes as a means for successful career (as individuals or as organizations) reinforces their ways of handling entrepreneurial intentions and actions. It is important, thus, to explain to students how business and enterprise values must go hand in hand with the understanding of social values of the society in which the business/enterprise will operate. Very important is also emphasising on how effective entrepreneurship depends on the coincidence between individual's personal values, enterprise and societal values. For example, improved social status improves self-confidence; this tends to expand the limit of business activities which also lead to more prosperity (individual or collective) (Kalkan and Kaygusuz, 2012).

Some salient entrepreneurial values that were at the centre of this study include risk-taking, pro-activeness, autonomy, innovativeness and competitiveness. They are discussed here below with much focus on individual than on organization. This is because individual entrepreneurs, public as well as private organizations are all interested in individuals who developed such values at an advanced level. Such individuals raise the competitive advantage of theirs, their entity and are always needed for sustainable, effective and efficient performance.

6.3.1. Risk-taking

One of the indicators of risk taking which recorded statistical significance in both groups looked at the individual's commitment to explore new areas. In making students understand the link between exploring new opportunities and risk-taking, it was a result of elaboration on the motivational, behavioural and consequential aspect of a risk-taker. In the behavioural theory, when people take risk, there are at least two important points to retain: 1) conscious awareness that the activities they are (voluntarily) engaging in expose them to possible harm; 2) an experience people value because of the positive experience of seeking a challenge and successfully mastering that challenge (Zinn, 2019). Before and during risk-taking, some scenarios are evaluated, choices are made and finally decisions are taken (referred to as reflexivity or consciousness dimension of risk taking). There is also that status of mind whereby adventure is driven by a certain treasure hidden somewhere in an unknown place that the risk-taker wants to explore and conquer (referred to as control or agency dimension of risk taking (Tulloch & Lupton, 2003, p.10-11). In the economic-capital context, "…business risk is regarded as the risk that due to changes in margins and volumes, earnings will fall below the fixed cost base. Examples are changes in competitor behaviour and changes in customer preferences" (Van Lelyveld, 2006). For Doff (2004) business risk refers to the risk of financial loss due to changes in the competitive environment or the extent to which the organization could timely adapt to these changes. In this definition, the competitive environment refers to all relations of the organization with clients, competitors, regulators and other economic actors (Doff, 2008).

Risk-taking can be voluntary or some motives can be behind it like the actual social or market context, social experiences and imagined futures (Zinn, 2019). It is also important to highlight that motives are certainly more complex depending on whether: *(1) risk is an end in itself*- the exploration of one's limits (the edge) and to confirm one's skills and abilities, which provide 'edgeworkers' with heightened feelings of autonomy, self-worth, meaning and confidence (Lyng, 1990, 2005). *(2) risk is a means to an end*- driven by a particular purpose such as material gain or developing a valued identity. One example can be taking part in aid work willing to tolerate or manage risks involved, for contributing to improving human well-being or to feelings of self-worth and social esteem (Roth, 2015), or starting a venture expecting to generate profit. *(3) risk as a response to vulnerability*- being in an unbearable situation (materially, physically or normatively) or being put under pressure and not having the resources to resist (Hayenhjelm,

2006). In analysing these different risks, choosing a profitable opportunity with risky alternatives rather than a safe opportunity with less profit was another indicator which also recorded statistical significance. This was perceived as a positive indicator that respondents improved mindset in choice-making or in risk-calculation. Here, being able to weigh the magnitude of risks against profits in the process of decision-making is crucial since it leads to striking the right balance between intentions, actions and benefits.

Contrary to the first two cases, risk as a response to vulnerability is a more or less desperate response to existential suffering which often results into necessity driven entrepreneurs. The latter as opposed to opportunity driven entrepreneurs accommodates such young graduates who find themselves on waiting lists for job seekers, those who fail to resist the situation and start survival businesses. The high rate of graduate unemployment in Rwanda appeals for appropriate measures that initiate students on how to identify, evaluate and manage risks before they find themselves in unbearable conditions. That is the challenge the entrepreneurship education for science students should address.

In scenarios of risk-taking assessment, Jaeger et al. (2001) considers reflexivity as a key tenet of the rational actor paradigm of risk-taking which requires ideally full knowledge and relatively stable preferences to rationally weigh the pros and cons of alternatives. Reflexivity is shaped by the society and societal incidence on it determines how an individual engages with the rest of the world. In fact, reflexivity is rooted in the milieus and structures as expressed in the concept of the habitus and habitual risk-taking. This means that large parts of everyday activities are part of routines that people learn during their upbringing. As students spend most of their time at school, they learn and integrate some analytical skills and adopt some behavioural skills that can help them to overcome social or academic related risks. However, as it has been explained, the environment in which students live, the society from which they come is not strongly business oriented. Businesswise, this has some negative influences on their capacity to deal with business related risk-taking activities.

As the taught modules raised students' awareness in terms of doing things in a way different from traditionally accepted, and confidence in own ability to succeed, this requires a perfect assessment of the society/market behaviors. On one side, risk-taking has to be learned and routinized and through the learning process risk-taking practices change. As entrepreneurs deal with uncertainty

on everyday basis, they must adapt strategies to deal with the changing nature of risks. From this angle educational institutions should put in place entrepreneurship promotion schemes that familiarise students with market risks, provide means and support that allow students to develop risk-taking capabilities not only in theory but also in practice. On the other side, risk-taking is often embedded in social activities and considered as a normal part of such activities (normalised risk-taking). Normalised risk-taking refers to how the risk-taking activity itself, the skills to master the risks, are routinely applied and change one's experience of a risky activity, gradually shifting what is considered risky (Zinn, 2019). Put differently, risk cannot be eliminated and for that purpose it has to be managed. Thus, students have to be aware that organizations need to manage all the factors that increase and/or reduce risks so that they can pursue strategic advantage at minimum costs (Borghesi & Gaudenzi, 2013). Such students who are informed about risk assessment pay attention to details and develop solid competences in risk-management.

Through practical learning, students have to act. In acting, they are confronted with risky situations that demand certain reactions. Such reactions should be well informed in order to minimise the damages that are likely to be caused by the risk itself or inappropriate decisions. Thus, the learning itself should take place in a free and competitive market environment, the one that is not largely influenced by the internal campus environment. Students or aspiring entrepreneurs should however stay in touch with mentors/coaches from their institution for possible interventions (mentorship, expertise, network, access to laboratories etc. where appropriate) to normalise their risk-taking.

6.3.2. Pro-activeness and competitive aggressiveness

When elaborating and reflecting on pro-activeness as an entrepreneurial value, students had to understand relational intentions and actions which can be expressed through tangible commitments and engagements in bilateral or multilateral interactions. Relations in business are about opportunity detection and exploitation (support, joint venture, knowledge/skills sharing in forms of collaboration, partnerships etc.); they are purpose oriented in latent or open manners; they are direct or indirect. Proactive moves can target competitors as well as supporting institutions thereby triggering and sustaining relationships, business talks, commitments, etc.

In the above framework, different authors (Frese & Fay, 2001; Frese & Gielnik, 2014) linked pro-activeness and competitiveness to behavioral active and passive approaches. For the active

approach, these are people who want to make an influence and/or who want to change the situation. One can say that their personal initiative spirit is exploratory and expansive. Their attitudes and behaviours are characterized by self-starting nature, proactive approach, and persistence in overcoming difficulties that arise in the pursuit of a goal (Frese et al, 1996; Frese et al.,1997). For passive approach, these are people characterized by doing what one is told to do, giving up in the face of difficulties, not developing plans to deal with future difficulties, and reacting to environmental demands (Frese and Fay, 2001). While in this study much interested lied in developing students' pro-activeness as a value, entrepreneurial training design incorporated components that actively push for interaction and reflection.

Self-starting reflects that the impetus for action comes from the entrepreneur him- or herself; the entrepreneur's actions are less driven by other people or immediate external demands (Frese and Gielnik, 2014). Self-starters are interested in initiating changes in the status quo or doing something new thereby leading to creating something new. Whilst Frese (2009) argues that self-starting constitutes an essential mechanism in effective entrepreneurship, Rosenbusch et al. (2011) affirm that self-starting entrepreneurs are good competitors as they are better able to differentiate their businesses from other businesses and to create competitive advantages that should result in higher performance. On this point, corresponding indicators that are linked to self-initiative under the proactive behaviours in this study included the need and interest of learners to establish new relationships and commitment to develop healthy relationships. Results have shown a high level of interest and commitment in such indicators for both groups before and after the training. From socio-behavioural perspective, students and especially youth are in the age of social expansion, they want to explore and are keen to building relationships. However, from business perspectives, such behavioural interest declines as there are no collective activities at the campus that push students to build business-driven relationships.

On the other side, pro-activeness intrinsically involves carefulness, preparedness and openness. Pro-active entrepreneurs are believed to having a long-term orientation, which helps them to anticipate and prepare for potential opportunities and threats. They are well prepared and ready for effective reaction when promising opportunities or threats actually occur. Pro-activeness is also judged an important component for successful entrepreneurship because it plays a key role in the identification and exploitation of new business opportunities (Shane & Venkataraman, 2000); anticipation and preparation for potential threats in the process of developing, launching,

and managing a new venture. Such preparedness is at the origin of contingency plans that are formed by entrepreneurs with positive effects for performance (Boyd, 1991).

In this context, the study checked the status of students in relation to “being the first to the market or to imitate, talking business topics often with peers, taking initiative and pursuing new opportunities”. The results demonstrated a low level of students’ engagement in these indicators although some positive progresses were registered after training. From that observation, universities have to adopt learning approaches that oblige students to get out of the campus to seek and collect data about a particular need or problem. The “problem or need-based” learning approach will challenge students to "learn to learn," work cooperatively in groups to seek solutions for real world problems (Duch, 1995). Simultaneously, as that approach falls under action-learning, students should be taught how to build on such a need, continuously identify, assess and exploit the opportunity. For example, alongside their studentship career, students can start a small business and learn how to establish relationships with customers and other stakeholders.

In the learning process, they have to find out the means and processes by which companies create value for customers and build strong customer relationships and loyalty for capturing value from customers in return. Entrepreneurship tools such as business model canvas help students to identify and systematically establish relationships between key resources that are needed for starting and growing a business; product development or service design, value proposition, customer relationships as well as financial management. Market assessment tools which are pro-customer centred supplement the business model and business plan. Not only such tools require communication and analytical skills development but also behavioural tactics that allow somebody to successfully conduct market intelligence. In assessing and tracing the value each of the players in the product/service chain adds at each step of product development, qualitative and quantitative data must be collected, analysed, synthesised and presented in a self-explanatory story. This inquisitive exercise, when well done, typically rounds-up market realities as they happen in the field; which makes it very easy to connect the data and reflect on them.

Persistence in overcoming difficulties that arise in the pursuit of a goal is a component of pro-activeness but also competitiveness. It refers to not giving up in the face of difficulties but rather solving problems or finding alternative routes to accomplish the predetermined goals (Frese and

Gielnik, 2014). It is known that entrepreneurs operate in complex and uncertain situations where successes and failures happen interchangeably. The situation can leave some weak entrepreneurs closing businesses completely while others renew. However, under similar circumstances persistent entrepreneurs overcome setbacks and correct past mistakes incurred in the development of a product, service, or organization (Markman et al., 2005). Individuals or organizations that demonstrate strong persistence are likely to be strong in competitive aggressiveness as well. This combative and resilient nature makes companies fight for long-term stay in the market, not just as spectators but as key players with or targeting strong market shares.

Persistence as an element of pro-activeness is also embedded in competitive aggressiveness. Both require goal setting and there has to be commitment to achieve them. Individuals set goals which, under normal circumstances, have to be achieved. The degree to which an individual is attached to those goals and the determination to reach them even when faced with obstacles is referred to as commitment (Houston, 2019)[7]. This aspect of persistence was assessed in this study through commitment to achieving own goal, commitment to seeking new opportunities, resilience until the idea becomes a reality, continued trials no matter the number of failures in the process and, happiness or comfort in a leading position.

Whilst Latham and Locke (2002, p.705) define goals as *"*the object or aim of an action, for example, to attain a specific standard of proficiency, usually within a specified time limit", Locke (2019) argues that goal setting will help individuals to achieve such goals as every person's life depends on the process of choosing goals to pursue. If an individual remains passive s/he is not going to thrive as a human being. Under such circumstances, goals refer to the level of competence that we wish to achieve and upon which we create a useful lens through which we assess our current performance (goal setting). As it can be felt, behind the goal and goal setting there must be some motivational factors which, in a way or another, determine why individuals within similar conditions get different levels in task performance. Goal setting theory "states that the simplest and most direct motivational explanation of why some people perform better than others is due to disparate performance goals, implying that setting and adjusting goals can significantly impact performance" (Houston, 2019). Therefore, entrepreneurship education steps in to teach students how to set goals that are specific, measurable, attainable, realistic and time bound. Students have

[7] https://positivepsychology.com/goal-setting/ accessed on December 3, 2019

to realise the close relationship between goal setting and action principles as they must be able to measure the success and failure of the procedures; attempt to get feedback that permits them to recognize whether they are on the right track or not.

In this proactive and competitive spirit, the training modules elaborated on the importance of setting goals for entrepreneurs and why they have to make sure every step they do towards the goals becomes successful. Results demonstrated that the new module produced significant statistical changes in both pro-activeness and competitiveness dimensions while the business planning module registered insignificant changes in both. One part of the justification relies on the fact that the new module capitalises on personality development and behavioural changes, uses tools that are more interactive, reflective and flexible to adapt based on the knowledge of actors and the targeted market. Such tools require high level of personal and group engagement and can be executed within short time. For the other part of justification, although the business plan helped students to gather important information about their business ideas and learn a lot about planning processes, it was time consuming. Students were requested to come up with locally documented data (secondary sources to supplement primary data) which they could hardly find in some cases. There was lack of or insufficient publications related to the (local) market sectors their business ideas fell in. There was also time conflict between entrepreneurship modules and other courses that students had to cover in the academic plan. This situation confirms Frese and Gielnick's (2014) argument that preparing business plans forces entrepreneurs to gather information about their industries and stakeholders that contributes to both greater knowledge and better understanding of the business environment. It is time consuming, hinders flexibility, and is based on insufficient knowledge about future events.

6.3.3. Autonomy

It was mentioned that the behavioral theory categorizes people into those who are active and those who are passive. Entrepreneurship characteristics show that successful entrepreneurs are proactive, eager to explore and exploit opportunities, deploy everything possible that can turn opportunities into profitable ones. In actual sense these people, as opposed to passive ones, do not wait to be told what to do, do not give up in the face of difficulties, they are pre-emptive in the sense that they develop plans to deal with future difficulties, and they react to environmental demands (Frese & Fay, 2001). What they achieve can be done independently or collectively.

When done independently they claim some levels of autonomy (also known as self-rule, self-governance or self-determination (Mappes and DeGrazia, 1996); when done collectively they are subject to influences and interferences from colleagues.

Autonomy is a concept found in many fields- moral, political, bioethical and business philosophy etc- and reflects the following three principles: capacity of a rational individual to make an informed and uncoerced decision; intellectual capacity to differentiate good from evil/bad and right from wrong; consciousness and good will to pursue what is good and right as well as to avoid what is bad and wrong (Manda-Taylor et al., 2015). When applied to business organizations, Kusumawardhani et al. (2012) show that different authors such as Lumpkin and Dess (1996) refer to autonomy as the ability to make decisions and to proceed with actions independently, without any restrictions from the organisation; or the strong desire of a person to have freedom in the development of an idea and in its implementation (Li, Huang and Tsai, 2009).

Despite the belief that this independence in action leads to better performance (still debatable to what extent) because people can be motivated to act entrepreneurially, autonomy can be perceived as an essential condition, but still insufficient for appearing and developing entrepreneurial initiatives (Lumpkin et al., 2009). There are some other factors that push or pull people to setting initiatives as we discussed under pro-activeness. When downgraded from organizational to an individual level, autonomy reflects the degree to which the work ensures the substantial independence of an individual in the process of work-planning and in determining the procedures of its implementation" (de Jong, 2015). Karpacz (2016) finds in this definition the extent to which an individual has the freedom to determine the scope in which s/he can decide which tasks to do and how. That requires a favourable environment especially when the individual is not the owner of the entity where autonomy has to/can be exercised.

In developing students' autonomy as one of the dimensions for entrepreneurial orientation, universities are seen as best places to begin with for motivating students to think and act independently. Academically, individual assignments are used to familiarise students with self-determination or self-reliance in task execution. Entrepreneurially it is still problematic due to conflicts of interest (business and academic) whereby most students find academic success as their priority. Although universities are relatively highly equipped with human and material resources that they can use in developing and transferring knowledge and skills, enhancing

autonomy in the context of students' entrepreneurship is not that easy. Yes, good policies and possibilities for funding some good business ideas exist but they cannot be done at a large scale. Through research and development, only few students and staff can team up for developing and transferring knowledge and technologies. Few students can therefore enjoy such an opportunity and privilege of self-expression.

Within the scope of entrepreneurial learning for autonomy, students are expected to come up with ideas, work on them independently. If a good product/service is successfully developed, learners grow not only in skills development, decision-making abilities but also enjoy a number of spill-over effects including commercialisation of the product or service; the branding of the developer's image as well as of the institution. Behind a successful product/service, the student's spirit of "I can", "I can do it independently" and "I can achieve it" increases self-confidence. One can go far to state that it increases the potential for (self) employment. Though this is the ideal situation that any entrepreneurship educator dreams about, students' self-expression and determination in a campus environment is not easily doable. Even if it is, it is not guaranteed in long-term. In Rwanda's campuses students face difficulties of finding favourable environments that simultaneously push and facilitate students to exercise their entrepreneurial expression, freedom of self-determination and self-realisation. Limited resources (human, infrastructure, financial, technological) limit the capacity and competences of students and staff to identify, assess and exploit opportunities. Existing environments seem to train students in favour of reliance on others and, given such environments, very few students can think differently. This is what is reflected in our results where most of students feel uncomfortable and not ready for self-reliance.

In this study the results related to autonomy demonstrated low degrees in self-direction in the pursuit of opportunities, ability to function independently, independence from others for task execution, and leaving a secure position to venture into new fields. This might not be the only case where studies identified similar results. In their study on "Students' entrepreneurial intentions: an inter-regional comparison" where Franco et al. (2010, p.260) assessed entrepreneurial intentions of university students in different European regions, they found that "just a small fraction of students is disposed to step into self-employment, and the vast majority has not yet made the decision". Though some authors argue that being at the university is the perfect time for students' entrepreneurship education (Wadhwa et al., 2009), we can also say that yes these individuals should profit that moment along with their disciplinary programs but, where

possible, develop their skills and knowledge through other channels including side work experiences.

Based on the results, there is a belief that through practical experiences outside the academic programs, students can develop autonomy and other substantial market competences. However, given the small size of the local employment market and its limited capacity for job supply, given the teaching environment that does not give students sufficient opportunities for performing extra curricula activities (especially those related to business decision-making), graduates are likely to find themselves in a long-term precarious situation. Many will fall and remain in the passive attitude and their level of innovativeness will be affected negatively.

6.3.4. Innovativeness

There is no universal definition of the concept of innovation. However, the literature shows that scholars converge on key characteristics such as being result-oriented, following an experiential learning process, and unpredictability of the process outcome. Innovation reflects the ability of an individual or organization to identify and make the opportunities work in practice. Such individuals/ organisations work out new combinations and see the new idea through to the end. In all its aspects, it is nearly impossible to miss out certain concepts including novelty, creativity, research, and organizational tendency to support new ideas to achieving competitive advantages in dynamic contexts. From organizational to individual level, innovation can be understood as a process developed, transmitted, and transformed by individuals, work teams or networks, at different levels of the organization (Axtell et al., 2006; King & Anderson, 2002). Having students, staff, equipment as well as time flexibility especially when it comes to R&D, universities as centres of knowledge creation and sharing remain the best places for developing and enhancing creativity and innovation behaviours amongst students.

As today's students are tomorrow's sources of innovations for organizations, governments and universities have the responsibility to turn them into employable labour forces of the future by developing their long-term attitudes, values and behaviours (including innovation behaviours). When graduates finish their studies and join the work environment, they have to learn new institutional values/norms and integrate them into the new lifestyle. As they expect the employer to build their competences, the organization expects the same benefits in return for building its solid competitive advantage. Therefore, fresh employees have to demonstrate behaviours oriented

toward the introduction of new useful ideas, processes, procedures, and products (Farr and Ford, 1990). Torres et al. (2017) refer to this situation as employees' innovative work behaviour. It reflects an employee's action addressed to the generation, application and implementation of new ideas, products, processes, and methods from his or her job position, department unit, or organization.

If entrepreneurship education has to develop learners' ability to innovate, it has to pay attention to the criteria mentioned above. However, there should be a clear distinction between the learners' propensity to innovate and the competence to innovate. In developing students' innovativeness (especially in short-term trainings) most of assessment efforts are directed toward the tendency to behave innovatively and not the demonstration of innovation competences in nature (as it demands proof of concept). This shouldn't be the case as innovation needs time as well as favourable environment. In their report on "Measuring Innovation in Education" in OECD countries, Vincent-Lancrin et al. (2019, p.3) argue that "education policy makers need to develop proper innovation policies, better identify key agents of change, champion them, and find more effective approaches to scaling and disseminating innovation".

In this study, innovativeness was assessed through learner's attraction by creativity and opportunism, interest in the value of achievement than the monetary value, tendency to support new ideas, spending most of the time thinking on novelty, and high interest in experimentation and creative processes. Both training modules induced statistically significant changes in the mean averages before and after trainings. One can assume that (with caution) the higher the learner's propensity to innovate the higher the competence in innovation (if all conditions are united). Caution is considered because results obtained based on the training materials can be positive, but the practical experience can turn different. We also consider that the degree of innovativeness depends on many factors including motivation, resources, technologies, return on investment, time and the pace of success during the innovation process. As already discussed under the expectancy theory, an individual will act in a certain way (innovatively in this case) based on the expectation that the act will be followed by a given outcome (success) and on the attractiveness of that outcome to the individual. The other reason as Vincent-Lancrin (2019:4) says is that "there is also little evidence that the curriculum emphasis on teaching the skills that will allow students to thrive in a world where innovation is critical have translated into different teaching and learning

practices. This is worrisome in a world where artificial intelligence and robotics might transform the role of humans in the productive and social processes".

6.4.EE and EO: Motivation to entrepreneurship or intrapreneurship career

Developing students' entrepreneurial competences usable for starting own venture or working for others comes back to developing employability skills that every employer is looking for in them. Whether employed or self-employed, both approaches serve for tackling unemployment challenges that many fresh graduates face. Teaching students how personal entrepreneurship skills as well as employability skills overlap and are complementary to each other means motivating students for developing competences that increase their competitive advantage. The teaching materials (content and approaches) helped students to have an informed understanding about career development in entrepreneurship and in intrapreneurship, comparative benefits between self-employment and employment by others. The training materials elaborated on career choices by linking industry requirements to academia's responsibilities (job skills requirements versus entrepreneurial skills development). This was done in order to remind learners that several factors can influence their commitment degree to self-employment or employment by organizations.

Apart from explaining the tools that students can use for effective performance in their employment career, enough time was spent in discussing market and employment realities in their surroundings. Students could identify local successful entrepreneurs, trace back their history, learn about the environment they evolved in, challenges and success they made, etc. They could realize that among successful entrepreneurs some couldn't go to school or finish; or failed some times before they reached the current level. Some were brought into entrepreneurship by pain, by fun or by plan. One of these situations can happen to them too which justifies the need for alertness and preparedness. No matter how one enters the field of entrepreneurship, students were reminded to set goals if they wish to succeed and, to make sure the setting is followed by perfect scanning of the environment in which activities will take place. Whether the goal is set for oneself or for the organization, the success will depend on whether the goal is perceived desirable and there is perceived ability of achieving it (Houston, 2019).

In line with the above but on a general notice, there has to be motivation and commitment for learning and acting from both the educators and learners. As Pouspourika (2018) says: "some entrepreneurial skills can be taught while others cannot. The key factor is motivation. The teachers need to be motivated in order to teach important parts of entrepreneurship to students and

students need to be motivated in order to understand the importance of the entrepreneurship skills and learn them**.** Entrepreneurship can, partially, be taught. But without imagination, innovation and a thirst to meet the unknown people will not be able to become true entrepreneurs." With regard to career prospects, results demonstrated that students could feel safer when they are employed by others. Although they perceive the importance of taking risks and associated benefits, the fear of being autonomous dominates the propensity to take risk.

In concluding this chapter, entrepreneurship education which trained students in business planning (control group) and the new action-oriented module (treatment group) contributed to their understanding of concepts, principles and processes for business entry, growth and sustainability. Not only had they learned processes (stages) of setting up an organization, associated needs and tasks, but also the generic entrepreneurship competencies (generic 'how to's'). They were able to comprehend and explain the concepts and tools delivered to them. Students could evaluate and structure their ideas following tool guidelines. They could understand the nature of the relationships they need to develop with key stakeholders (customers, competitors, partners) and the responsibility to practically engage them in their real environment.

We observed that proactiveness and competitive aggressiveness registered positive trends in both modules. However, they did not register statistically significant differences in the business plan module while they did with the new action oriented. Such differences were linked to teaching/ learning approaches and tools. The business plan used the instructive approach which privileges theories/concepts explanation and pushed students to find out referenced data (reports, publications) for legitimizing their planning process. While the process and data are critical to successful business projections, the data mining develops analytical and critical thinking which help students to identify different strategies used by various market actors. However, they are limited in terms of allowing learners to observe directly entrepreneurs' emotional attachments to own ideas and experiences (failures or successes). Yet, this is also critical as an inspiration.

On the other side, the new module privileges action learning whereby students construct knowledge through gathering and synthesizing field information. Students learned, developed and integrated skills related to market investigation, communication, critical thinking, problem solving and so on. The pedagogies obliged students to develop proactive behavioral strategies that they applied for acquiring information in friendly and flexible ways they feel are the best and

appropriate to their business cases. Inspired by producers and consumers' strategies observed from the field, students challenged their mind for finding out the best competitive strategies they could apply to their business ideas.

Students in both groups did not significantly change their mindset in terms of autonomy. Developing autonomy requires exposure to a free environment whereby the person is entitled the freedom to decide what fits his/her choices. It also demands that someone feels the presence of somebody else and at a certain point the pressure, influence and interference in his/her plans. Such a free environment does not exist at the campus. Therefore, conditions outside the campus could influence why students showed low levels in autonomy. Another reason can be linked to the financial inaccessibility. Most families have almost exhausted their financial capacities by paying students' school fees while banks are reluctant to give loan to the youth without prior experience in business. Banks request collaterals that the young graduates don't have thereby killing the proclivity to start own business.

In both groups, the theory and practice helped students to get an improved understanding of what entrepreneurship is, how it is linked to their disciplines, and how it can be exercised through own ventures or others' organizations. We also argue here that results obtained were context dependent. This means further studies need to be done considering a different environment and different selection criteria to check whether similar outcomes can be obtained.

We assert that the new module is applicable to different target groups, is flexible and easy to implement, and can be taught once or in sequences across the academic career. Despite that people can develop the "know-how to do's" in terms of "skills and process steps", science students need special attention and a perfect environment that connects them with market. Most importantly they need a learning environment that allows them to make an advanced step towards "entrepreneurship learning by doing". Per the wishes of the government, this can develop and produce graduates who are ready to create jobs and not seek jobs. Per the wishes of educators and learners, effective development and transfer of knowledge in entrepreneurship requires practical exercises in the real environments (academic and market altogether). Per the wishes of recruiters, such graduates/employees produce immediate benefits to the organization thereby reducing efforts for integration and associated costs.

7. CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1.Conclusion

It is a common expectation that when students graduate they possess knowledge, skills and competences that allow them to fulfill basic employment requirements in their field of education. In developing people to supply to the job market educational programs consider whether students get competences that fit the market needs. The knowledge and skills can be generic or specific which justifies why employers make different selection criteria during recruitment. Depending on the nature of the job to be performed, some employers may be interested in the generic skills while others are interested in specific competences. On the other side, when students join academic institutions, they have certain objectives that motivate them to choose a specific program. Each program outlines predefined exit profiles and the institutions develop students' capacities to meet such specific exit profiles. In this threesome context (educationist- student – employer) providers and recipients of education have certain objectives that must be achieved and there should be strong harmony in the teaching, learning and employment processes.

However, it may happen that the disciplinary knowledge acquired or the high grade obtained by a student at school is not sufficient for securing a promising and successful employment career. After finishing their studies graduates may find themselves in situations whereby they get employed by others, or they have to create their own ventures, or they stay unemployed. No matter what scenario one finds himself or herself in, entrepreneurial mindset is key to successful career as the nature of jobs today requires entrepreneurially minded people. Entrepreneurship has been identified not only as a skill development tool for wealth creation but also as a tool for employment creation (for individuals, organizations and governments). Many countries including Rwanda which are confronted with the high rates of graduate unemployment, recommended entrepreneurship courses at different levels of education. The purpose was to equip students with basic business skills, develop individuals with entrepreneurial drive and, induce some changes in students' mindset and behaviours towards career opportunities. Students are invited to shifting their learning attention from marks and job seeking to studying for job creation and solving societal problems.

Apart from business schools that teach business in details, entrepreneurship is also used in other academic majors as a motivation for students to the world of business. Business plan is used as

the main module instrument for training but studies demonstrated that it is good for venture creation and management (because everyone else can learn how to do the process) but not effective for developing entrepreneurial-like-thinking (because this involves using implicit knowledge that keeps changing depending on specific conditions). Scholars identified that in teaching entrepreneurship the question is not only the content (what) but also the alignment of the teaching approaches (how) with the interest and purpose of learning (for whom and for which results). Instead of teaching various functional activities of an enterprise (business plan), teachers should be developing a range of behavioural attributes that an entrepreneur needs, instilling empathy with entrepreneurial values, and developing the capacity for strategic thinking and scenario planning and the practice of making intuitive decisions based upon judgement with limited information (action-oriented module).

We argue that both the Business plan and the Action-oriented module develop entrepreneurial orientation but we believe that the action-oriented module induces more changes in individual entrepreneurial-like-thinking. This may give it the advantage of being proposed to education strategists and policymakers for students' entrepreneurial motivation. We believe the action oriented model applies well and easily to environments where learners have no background or little knowledge about doing business, where learners have difficulties in associating their disciplinary knowledge and skills to market opportunities before and after graduation, and where training organizations identify time constraint as an impediment to raising awareness, developing and transferring entrepreneurial values.

Despite the fact that when students have finished their studies are expected to have basic knowledge, skills and competences allowing them to perform well in the field of employment, they may find the market environments have changed, new skills and behaviours are needed in the market, or they are too many to be absorbed by the available job supply capacity. Given that the career's environment in which graduates aspire to evolve requires more entrepreneurial-like-thinking values and behaviours, or it requires much of discipline specific skills, it is of utmost importance for students to be aware of the most sought out competences in the market, learn them and know how to adapt them to the constant changes they are likely to face in their career. Graduates may also discover that some skills or behaviours can be learned at school along with the disciplinary programs, and that such an opportunity and awareness impact their exit profiles.

Developing students' entrepreneurial orientation while at school increases their self-confidence and prepares them for overcoming market uncertainties.

Entrepreneurship and employability skills are overlapping which means developing one implies developing the other automatically. As today the nature of jobs, technology, market interactions, global competition etc. keep changing; they affect how individuals and companies do business. As it is no longer sufficient for students to rely on disciplinary knowledge/skills alone, they need to develop additional competences that can allow them to think and act entrepreneurially. They have to be proactive, creative and competitive in the spirit of fitting into the change process; they have to induce successful performances in the organizations. That is why designing entrepreneurial education program requires paramount consideration of the occupation (what to become in the future), employment (preparing a workforce better able to support, and eventually start, entrepreneurial firms), and knowledge creation and technology transfer (commercialization of the intellectual property created at the university by students and staff).

As we already discussed, entrepreneurial values can be utilized for venture creation (traditional entrepreneurship) or for an already existing organization (intrapreneurship). The challenge for the educator is always finding the perfect fit between the objectives of the target audience and those of the teaching institution, and the right methodology to develop the values and competences. Effective teaching of entrepreneurship requires proper identification of skills gaps and proper streamline of learners' entrepreneurial orientation. The methodology is one which helps to develop an individual's mindset, behaviour, skills and capabilities and can be applied to create value in a range of contexts and environments from the public sector, charities, universities and social enterprises to corporate organisations and new venture start-ups. Educators and learners also have to identify the motivational factors for learning, to evaluate the expected benefits after learning and, to rightly determine the scope and objectives of the learning. Whether it is learning "about, for, in or through" entrepreneurship, it is important to remember that the most important outcome of entrepreneurial efforts and efforts exerted (in the learning process or during idea implementation) is closely related to the individual's motivation.

The learning environment should put students in a setting that allows individuals to work on problems aimed at organizational as well as individual development; the interaction between learners and educators should happen in an environment of doing where the knowledge/skills

transfer is done vertically (teacher to student) and horizontally (peer learning among students) in a friendly and flexible atmosphere; and learners should get out of the school comfort zone to meet the main market actors (producers/sellers- consumers) in order to see and feel the market relationships and complexities (market assessment), and develop their projects based on practical realities rather than imagination. In other words, at the end of the learning process, students should have the ability to identify and exploit a business opportunity, the human creative effort of developing a business or building something of value, the willingness to undertake risk, competence to organise the necessary resources to respond to the opportunity, and ability to set the differences between people. It is in the interest of every training institution to produce graduates who enter the market with perfect know-what (cognitive knowledge the individuals develop about what to do in order to perform entrepreneurship), know-how (steps to take to achieve an outcome and how to effectively and efficiently put knowledge into practice), and the know why (personal logic, encompassing both reason and emotion, which enables the individual to act entrepreneurially, and specifically, to create new ventures, units or renew).

In training science students in this study, we considered that both the Business Plan module and Action-oriented module are useful for developing entrepreneurship values. We considered that students must be in the pre or final year and must not have had an entrepreneurship training since they joined the university. A random selection of students was done to divide them into control and treatment groups. The control group undertook the business plan and the treatment group undertook the action-oriented module. As the module design demonstrated, the content and material of the introductory part of the modules is identical. Pedagogies used in this part are also identical but a bit different in other sections as the teaching plans describe. In general, the entrepreneurial teaching approaches ranged from theoretical to action/experiential learning, the knowledge transmission techniques ranged from teacher-centered to student-centered, mass instruction, individualized to group learning. Iterative, interactive as well as reflective learning techniques were used in order to move beyond personal views and experiences to examine other's views and arguments.

The purpose of diversified pedagogies was that learners fully learn when they are in a learning environment that situates learning as a relationship between the learner and the world, mediated by the teacher. Students were facilitated to learn-to-learn not to learn-to-reproduce the matter given to them by the teacher. The latter has been identified by other studies as the main hindrance

to entrepreneurship skills and competence development in Rwanda. In Rwanda, the teaching and evaluation approaches have made students concentrate on memorising and reproducing the knowledge/skills or processes they have learnt instead of applying the learning tools in an environment of doing. Put differently, they learned for passing the exams not for developing their entrepreneurial personality.

By teaching and comparing business plan and action-oriented modules for science major students, results demonstrated that the new action-oriented module produced better results than the Business plan. The results generally demonstrated that in the perspective of future uncertainties where graduates enter soon after graduation, students in both groups understood the importance of knowing what is happening in the marketplace but were unwilling to step into self-employment. Despite the willingness to build relationships with others, students' commitment to talks or support to matters related to business or markets were not sound. Results also revealed reluctance to becoming independent or autonomous as this construct registered the lowest mean averages and insignificant statistical changes in both groups. We justified this situation in terms of unfavourable teaching environment which does not provide space and opportunities for students to be exposed to business realities (from the time they join the institution), the teaching approach and habits that promote learning for passing the exam and not studying for solving a problem, and the local market environment which is limited in supplying employment opportunities (short term, intermittent) that can allow students to do extra academic activities that familiarise them with business/market. Despite such challenges, teachers' motivational speeches, mentorship and demonstration of linkages between disciplinary knowledge/skills, entrepreneurship, employment and societal needs influenced the thinking mindset of students positively.

The time constraint prompted teaching the program in a short time and could not allow observing the behavioural aspect of students in real market after graduation. However, we can confirm that flexible application of the training materials used in the action-oriented teaching process led to improvements in market analysis and process of doing business. The different components of the new action-oriented module can be taught once or in separate shifts across the academic career, are adaptable to any target audience (with or without business background), can be transferred using traditional or modern knowledge/skills transmission approaches (teacher-centred or student-centred), or a mix depending on the nature of the target audience or the purpose of learning.

The experience showed us that teaching entrepreneurship to students not only helped them to identify actors and success factors in the process of business generation and development but also helped them to map and trace the product or service value additions in a short period. With such inclusive, expansive, proactive and reflective learning methodologies, students captured some aspects of value chain analysis as well. This is practical and fits well with the development of business ideas that fall in line of production or manufacturing. The approaches help learners to collect and present qualitative and quantitative data simultaneously. Also, approaches delve students into qualitative and quantitative research methods which improve their ability to understand supplier-customer relationships.

Another strong aspect that educators need to examine well before the course delivery starts, is the degree of love and attachment to one's own idea and the extent to which, along the general training process, the pedagogies will give room for personal idea development. Entrepreneurship education as designed in the curriculum tends to be generalised while the aspirations of the learners tend to be individualised. In an environment of unemployment threat, this has some implications on the learning outcomes. In case the institution does not provide other opportunities and channels for students to learn and develop entrepreneurship skills, the programmed learning becomes their sole opportunity to dig deep into the learning and application without extra cost. They may expect to get support by using institutional infrastructure and equipment, coaching and mentorship expertise, field studies etc, all within the context of programmed learning. Therefore, curriculum execution should carefully consider students time and expectations vis-à-vis pedagogical flexibility and didactic materials.

Finally, there may be some challenges in the coaching and mentorship of students as some business ideas require technical knowledge and skills that trainers don't necessarily have. In some cases, it is possible to find a good idea which requires external expertise or laboratory tests but fails to progress because of time constraints; or the training institution did not budget for such experiments; or the expert is not available; or when s/he is available s/he imposes difficult conditions. When a student sees some of brilliant ideas cannot be processed or implemented due to technical or financial constraints, some degrees of demotivation can be translated into lower commitments towards risk-taking or autonomy. At the end of their programs, students will largely tend to apply for jobs in existing organizations (intrapreneurship) instead of collecting means for

creating their own companies (entrepreneurship). This can also lead students to concentrate more on disciplinary knowledge than entrepreneurship skills.

7.2.Recommendations

Academic institutions as well as students are enthusiastic about developing entrepreneurial competences. On one side, we have demonstrated the complexity and potential bias between the learning objectives and the means and strategies for achieving them. On the other side, in a country where the majority of graduates are found jobless after graduation, entrepreneurship education is promoted by policymakers in different sectors for serving extra-learning purposes. Based on our findings, the following recommendations can be taken into consideration in order to ease the situation.

1. **Streamlining EE objectives and intended purposes of learning**

While adopting entrepreneurial education policies, decision-makers in education have to effectively align relevant teaching materials with technical and financial support schemes that attract learners towards entrepreneurship. EE needs a proper identification and comprehension of the need and purpose of learning (motivation and expectations) and good synergies between various actors (teachers and students, students among them as peers). It requires well established supporting schemes that integrate teaching/learning with research and development, knowing and feeling the world of entrepreneurs in real sense (with creation of small businesses or in market field researches).

Policymakers want academic institutions to produce students who will create jobs instead of seeking jobs but local conditions show that students have limited exposure to entrepreneurial activities. While entrepreneurship is a cross cutting subject across all majors, its local mindset gives the impression that its main purpose is creating business (a product or service in the traditional teaching philosophy) instead of developing personality characteristics that enhance experiential lifelong learning that can apply to both personal business and others'. Studies demonstrated that yes entrepreneurship values are embedded in actual products and services but when the government recommends university fresh graduates to undertake short-term hands-on-skills trainings in the name of entrepreneurship, provides them with toolkits to start business operations yet it does not provide anything to students who successfully passed the

entrepreneurship course at university, the hands-on-skills will render the programmed learning obsolete. This becomes a clear indicator that the purpose of the programmed learning at school is not well understood to achieve its objectives; and an accurate justification of why educators and students focus on theoretical learning that results into passing exams only. Under such conditions, EE as an academic tool becomes a shortcut and a substitute for politico-economic and societal missions.

To eliminate this, policymakers and educators should clearly identify the objectives of learning by program, properly and constantly follow-up the trend of the markets by program and, put in place strategies that facilitate achieving results without self-imposed destructive competition (programmed academic programs versus short-term postgraduate trainings). It is important that policy makers get well informed that developing explicit and implicit knowledge generates positive impacts in creating own organization or working for the existing one too. Therefore, job creation should not be considered the main purpose of learning rather a spill-over effect of EE. Entrepreneurship values development should not be confined to job creation only.

2. Putting in place favourable environment that supports the learning-by-doing

There is a generalised lack of qualified staff in pedagogies for teaching entrepreneurship in the country, lack of teaching materials designed in the spirit of action-learning, lack of spaces for developing and testing students' ideas, lack of personnel expertise for coaching and mentorship etc. Such a situation complicates not only the creation and transfer of the theoretical knowledge but also prohibits the experiential development of the person who is soon to become an employer or employee. Academic staffs prefer transferring theoretical knowledge and skills but fail to apply some tools necessary for entrepreneurial mindset and behaviour development. In some situations, lack of resources is associated with a big number of students that one teacher has to cater for. When the time allocated to the course is too short, the practical solution for a teacher is to transfer theoretical knowledge. Therefore, developing action-oriented teaching materials should go along with investments in human resources at the program and supporting unit levels so as to develop and avail required expertise in product development and entrepreneurship skills. Under such framework, entrepreneurship education generates ideas that university experts and students can develop together or integrate them in a wider context of research and development.

Furthermore, existing time allocated to entrepreneurship course (35-65hours) may be sufficient for an introduction to entrepreneurship but not enough for science students to understand and engage in entrepreneurial activities at campus or outside the campus. Such time permits basic awareness of key concepts and principles about and for entrepreneurship but does not allow students developing values and competences required for performing entrepreneurial activities in self-employment or employment by others.

Therefore, there should be enough time for teaching and for practice, spanning from the first year to the final year (in the case of teaching in sequences). The first year should focus on explaining entrepreneurship/intrapreneurship concepts and linking them with market skills requirements as well as business idea generation (within the scope of students' academic field); the second year should focus on business model development and evaluation (concepts and tools, principles and processes applied in a simulation context); the third year should focus on market, product/service chain analysis (concept and tools applied in the field). In some contexts, students should join companies operating in their field of expertise for a week or two just to enquire about market challenges and how companies behave. This can be done independently or as a component of the internship assignment. Field visits of some hours or one day are not sufficient for deep understanding of the market operations and complexities as they provide superficial information only.

3. Changing entrepreneurship education monitoring and evaluation strategies

In order to stimulate the interest of students into entrepreneurship and evidence-based learning, best business ideas should be supported through various means- formal and informal (research and development, incubation or innovation facilities, networking etc.). If the existing teaching time plan (which is not enough) is coupled with learners' financial inaccessibility, it reduces the empathy towards the world of entrepreneurship and the likelihood of obtaining tangible results on the ground. Experiential or action learning should not be tempted to limit itself to the understanding and application of the training tools; it should lead to effective transformation of the business ideas into a solution of a problem/need. Such processed ideas serve as model examples to the next generations. Therefore, in order to have pedagogies that develop practice-oriented and entrepreneurially minded graduates, there should be a change in the monitoring and evaluation processes.

The monitoring approach should see educators and students setting up a work plan describing students' area of progress, challenges as well as special needs that go beyond their capacity. The special needs (for example laboratory tests, technical expertise) should be addressed through institutional means. A compiled annual monitoring report informs the institution about the competences of their students, quality of education provided, creative ability of students and staff, and the contribution of the institution towards solving market or community problems (through product or service development, job creation, wealth creation etc).

The evaluation process should consider the development of students in different stages of the learning process. We recommend two evaluation schemes. The first considers EE as a longitudinal programmed learning while the second considers EE as a onetime short-term training.

As a longitudinal program, in the first year, students should be evaluated on their cognitive capacity (know what- theories, concepts, principles). In the second year, students should be evaluated on entrepreneurship processes (know how-to-do: process steps and tools; and know-why). In the third year, students should be evaluated on how-to-do (how best and efficiently plus product/service prototypes). Theories or concepts can be for example entrepreneurship, intrapreneurship, marketing, business idea, employment/employability etc. Tools can be business plan, business model canvas, value proposition canvas, market map etc. Students should produce a 10 page business model document describing and justifying the prototype in its different developmental stages. The prototype should be market at 60 percent and the document at 40 percent. By so doing, the student is evaluated in terms of knowledge, skills and behaviour (as a package of the education philosophy), but also in terms of ability to link (disciplinary) competences with market needs (as per the objective of EE). A 5 Likert scale measurement can be used where 1 stands for the lowest and 5 the highest improvement. Students are graded according to averages recorded in the areas of "concepts and tools". Thereafter, students can be put into three competence categories: Basic, Advanced, and Excellent. Basic includes averages less or equal to 2 (≤ 2); Advanced includes average above 2 but less or equal to 4 ($> 2 - \leq 4$); Excellent includes averages above 4 but less or equal to 5 ($> 4 - \leq 5$).

Table 42: Individual entrepreneurship awareness: Knowledge/Skills - Concept/Tool matrix

Knowledge and skills	Cognition level /Understanding					Psychomotor/ Skills level (Principles and Process steps)					Behaviour/attitude level (Knowledge and skills application)					*Average concept (1)*	*Average tool (2)*	Individual 1		Individual 2….		*Competence categories*		
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5			1	2	1	2	*1*	*2*	*3*
Concept 1																x								
Concept 2																x								
Concept 3																x								
Tool 1																	x							
Tool 2																	x							
Tool 3…																	x							

Source: Author's elaboration, 2019

For short-term trainings, evaluation will depend on the purpose of the training/learning. Obviously, any learning will involve different cognitive, psychomotor, and affective levels. In our case, the evaluation of EE will consider how people feel they have improved in different dimensions of EO. It can also be possible to identify which concept and/or tool contributed to the improvement of which dimension area and to what degree (Table 43). The evaluation of the "Tool" automatically involves the evaluation of the teaching/learning methodologies, but in case the evaluator wants to focus on the methodologies alone, the shift will focus on specific individual methods. However, that may be a bit difficult because entrepreneurship teaching involves a mixture of approaches. On this point though, if the teacher interchanges different methods and tools for enhancing one specific dimension, the evaluation scheme will facilitate a comparative analysis.

Table 43: Individual EO development: Concept/Tool - Dimension matrix

Concepts and Tool/ Dimension area	Concept 1, 2…					Tool 1, 2…					*Average concept (1)*	*Average tool (2)*	Individual 1		Individual 2...	
	1	2	3	4	5	1	2	3	4	5			1	2	1	2
Autonomy											x	x				
Risk-taking											x	x				
Pro-activeness											x	x				
Innovativeness											x	x				
Competitiveness											x	x				

Source: Author's elaboration, 2019

7.3.Scope for further research

Entrepreneurship education as a means for developing entrepreneurial orientation is broad in nature. As discussed, some educators focus on business planning while others focus on mindset change and personality development. EO emanates from organizational strategic decision-making approaches and reflects the organizational performance assessment in the market environment. Within an organization, it is possible to know who initiated what, when and with which resources for attaining the organizational objectives. It is also easy to evaluate the degree of success or failure registered in the process and what kinds of remedies have been taken. In the case of EO for students, it is a bit challenging to evaluate some dimensions such as innovativeness or risk-taking as these require tangible market oriented behaviours and attitudes that normal students are not likely to demonstrate during their studentship (if the learning approach is not practice-driven or if the learning is short-term). On top of that, there are emerging online teaching platforms which reduce or eliminate the interaction between students and teachers thereby impacting interventions by human intelligence. With the increasing limitation of human interaction in the teaching process and approaches, future studies should assess the impact of the diminishing interface between learner - teacher on EO development.

We also argued that people can become entrepreneurs by pain, by fun or by plan. Entrepreneur students by pain (want to eliminate pain by any means possible) exhibit high degrees of entrepreneurial values; they struggle and take risk to overcome future uncertainties and also demonstrate some creative ways to do business while following courses simultaneously. They anticipate being unemployed after graduation and use every possible opportunity to tap into business; they sell small items to fellow students at campus or in their neighborhoods; they skip some classes in order to earn a living; they work extra-time in order to succeed in both academia and business etc. Entrepreneurs by fun find themselves in the business environment without prior serious plan and may have successfully fallen in love with entrepreneurship by mere experiment. Such types of entrepreneurs may do business temporarily or seasonally when they have time and that business is not necessarily the main source of living. Entrepreneurs by plan take their time to scan the environment, identify the opportunity or need and respond by providing a potentially profitable solution. Such entrepreneurs take their time and take calculated risks; they plan strategically and commit enough time to their business. They are likely to be few on the campus, rely on other sustainable sources of income for surviving, and mostly launch their business after

graduating. As these categories of entrepreneurs are found in every society, studies can look at the extent to which the action-oriented EE induces differences in EO between unemployed graduates and fresh employees in high risky and less risky market sectors.

Lastly, teaching entrepreneurship to individuals who have no background in business is likely to produce results which are different from those of individuals with background in business, or related disciplines, or individuals who attended trainings in business skills. Business students are believed to have advanced entrepreneurial drive and mindset; and this belief applies equally to individuals who voluntarily register for a business or entrepreneurship training. They show primary behavioral signs of pro-activeness, creativity and competitiveness. Therefore, future researchers can assess whether, and to what extent, the entrepreneurial action-oriented pedagogies and tools induce any differences in EO between business and not-business students. To what degree do they fill students' entrepreneurial zone of proximal development.

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Annexes

Annex 1: Teaching plan of the Business Plan

Day	*Time*	*Topic*	*Content*	*Objectives*	*Methodology*	*Implementation approach/ plan*	*Observations/ Principles*
Day 1	8.30–12.30	Introduction to Entrepreneurship	Entrepreneurship Characteristics	• To check up and raise awareness of personal entrepreneurship characteristics	Lecture + Interactive +Individual assignment	• PPT (45min) • Q&A(15min) • Questionnaire for PECs (45min)	For PECs, request respondents' honesty because there is no judgment of their results
	14.00–16.30	Business Idea generation and selection	Techniques for assessing and selecting best business ideas	• To peruse information for the most viable business idea • To explain the BIG template	Introduce a business idea contextualisation template + Group exercise in class	Lecture + exercise Brainstorming (30min) + Mind mapping (30min)	Form two groups and each: • answers questions in the template • keeps up to 2 ideas for each question in the template • Imagine connections between various pieces of ideas (use different colours for key pieces of ideas) • Keep two ideas only for each key piece
Day 2	8.30–12.30	Business Idea Generation (BIG)	Recapitulation + Develop own business idea	• Identify and assess the best business idea	Individual exercise	Fill in the template + Coaching	
	14.00–16.30	Business Idea Generation (BIG)	Pitching individual ideas	• Group formation • Selecting ideas closely similar	Q and A + Individual pitching	2 min each business idea	After pitching, form groups of 5 persons each; select one business idea to develop till the end of the training
Day 3	8.30–12.30	Business plan: General introduction	• Business plan structure • Executive summary • Personal information	• To introduce business plan concept and its role in business management	Lecture	PPT + Q&A	

	14.00–16.30	Business plan: Company description	• Vision and Mission statements • Business goals and strategies	• To define a clear roadmap towards business success • SWOT analysis	Lecture + Interactive	PPT + Group exercise (90min)	
Day 4	8.30–12.30	Business plan: Industry and competition analysis	Industry description • Products/ Services • Competitors • Customers	• To analyze the Market and market trends • To develop competitors' profile • To define the target market	Lecture Interactive	PPT + Simulation exercise (90min)	Trainer asks groups/ the audience to choose a renowned product/ service in their market area, use it as an example in class for facilitating the next discussions and flow of contributions among members on their ideas.
	14.00–16.30	Business plan: Risk assessment and Marketing	Strategic positioning and Risk assessment Marketing strategy	• Differentiating business from competitor's • Identifying marketing and sales approaches	Lecture + Interactive	Group exercise (60min) + Q&A	
Day 5	8.30–12.30	Business plan: Operations management	Track of inventory + Production plan	• To identify start up resources and costs	Lecture + Interactive	PPT (90min) Group exercise (120min)	
	14.00–16.30	Business plan: Management of the business	Management structure and budgeting for Human Resource	• To design the organizational structure • To identify key personnel + their expertise	Lecture	PPT + Exercise (60min- developing Terms of References)	Group members develop ToR of three positions at least (Two key positions and one lower position)
Day 6	8.30–12.30	Business plan: Budgeting	Financial plan • Income statement	• To explain key concepts and financial instruments • To develop the financial plan	Lecture + Interactive	Group exercise (Budgeting 90min)	One group is chosen for case study (other groups continue exercises based on their projects)

	14.00–16.30		• Cash flow	• To assess the profitability of the business	Interactive	Group exercise	
Day 7	8.30–12.30		• Balance Sheet	• To develop the financial plan • To assess the profitability	Interactive	Group exercise	
	14.00–15.30		• Final presentation	• To get an idea of how a business plan looks like	Reflective	Q&A	Participants get extra time to carefully fix some gaps before submission of the final plan
	15.30–16.30	Checking progress in PECs	Assessing PECs	Assess the progress in PECs awareness and abilities	Individual assignment	Filling the questionnaire	For PECs, request honesty and realism in assessing areas where they feel strong and where they need help.

Annex 2: Teaching plan of the New action-oriented entrepreneurship module

Day	*Time*	*Subject*	*Content*	*Objectives*	*Methodology*	*Implementation Approach/Plan*	*Observation/Principles*
Day 1	8.30–10.30	Introduction to Entrepreneurship	Entrepreneurship Characteristics	• To check up and raise awareness of personal entrepreneurship characteristics (PECs)	Lecture + Interactive +Individual assignment	• PPT (45min) • Q&A (15min) • Individual questionnaire for PECs (45min)	For PECs, ask learners • to be as honest as possible because of no judgment of their results • to realistically identify and assess areas they feel strong and areas they need help
	Morning break						
	11.00–12.00	Introduction to Intrapreneurship	Personality types + Skills for work	• To know the qualities of a good employee • To link entre-preneurship with employment	Interactive + Lecture	• Q&A (30min) • PPT presentation (60min)	Learners reflect on employees' qualities/ skills needed in (for ex.): • manufacturing • service
	12.00–13.00	Business Idea Generation (BIG)	Techniques for assessing and selecting best business ideas	• To peruse information for the most viable business idea • To explain the BIG template	Introduce a BIG template (in-class demonstration) + Individual/Group exercise in class	Brainstorming (30min) + Mind mapping (30min)	Form groups (some in service, others in manufacturing) • Each group fills in the BIG template • Each group answers up to 3 ideas per point • Imagine connections between various pieces of ideas (use different colors for key pieces of an idea) • Keep only two ideas for each key piece

	Lunch break						
	14.00–16.30	Business Idea Generation (BIG)	Develop own business idea	Identify and assess the best business idea	Individual exercise	Fill in the template + Coaching	
Day 2	8.30–10.30	Business Idea Generation (BIG)	Recapitulation + Pitching individual ideas	Group formation Selecting ideas with close similarity	Q&A + Individual pitching	5 min each business idea	After pitching, form groups of 5 persons; each group selects a business idea to develop till the end of the training.
	Morning break						
	11.00–13.00	Business Model Development and Evaluation	Business Model Canvas (definition, factors and evaluation)	To explain the tool and process for developing a wining Business Model	Presentation + Q&A		
	Lunch break						
	14.00–16.30	Business Model Canvas	Customer segmentation: • Describing customer profile	• To stimulate attention to details and logical thinking in market environment • To describe the needs, requirements of potential customers	Lecture + Interactive	Personas (PPT = 30min) Group exercise + Coaching (120min)	• One idea per poster • Posters have different colors • Participants can draw or paint the picture reflecting the profile of the potential customer
Day 3	8.30–10.30	Business Model Canvas	Value proposition • Product/ service description	• To stimulate learners' imagination and creative thinking • To identify competitive advantages	Lecture + Interactive + Reflective	Product clinic (PPT = 30min) Group exercise + Coaching (120min)	Participants describe the product characteristics or benefits the customer gets from consuming the product
	Morning break						
	11.00–13.00		Value proposition • Product/ service description	• To stimulate learners' imagination and creative thinking	Interactive + reflective	Group exercise + Coaching (90min)	Participants describe the product characteristics or benefits the customer gets from consuming the product

				• To identify competitive advantages			
	Lunch break						
	14.00–16.30		Identification of • Channels • Customer relationships	To describe the rationale of how an organization creates, delivers, and captures value for customers	Lecture + Interactive + Reflective	What is CR (PPT =30min) + Group exercise + Coaching (90min)	Semi-structured brainstorming to limit participants to 3 major ideas
Day 4	8.30–10.30	Business Model Canvas	Identification and description of • Revenue streams • Key resources	• To identify sources of income from successfully delivered value propositions • To identify (non) disposable assets for effective delivery	Lecture + Interactive	What is a revenue stream or resource? (PPT =30min) + Group exercise + Coaching (90min)	• Prioritize streams that generate high revenues and are easy to reach • Prioritize efficiency in the use of assets • Participants use posters, one stream/resource per poster (use different colors)
	Morning break						
	11.00–13.00		Identification and description of key • activities • partnerships • Cost structure	To identify activities, responsible person (internal or external) and how much on what	Interactive Iterative + Reflective	PPT and discussion = 30min + Group exercise + Coaching (90min)	• Learners list key activities and link them with the responsible stakeholder/partner (internal or external) • One idea per poster
	Lunch break						
	14.00–16.30		Presentation of business models by participating groups		Interactive	Visualization + presentation + Q&A	Groups hang up posters according to blocks and discuss with the rest
Day 5	8.30–10.30	Rapid Market Appraisal (RMA)	Rapid market appraisal • Principles and approaches	• To show and involve participants in how to quickly	Iterative and interactive	Lecture session + Q&A	• Identify market outlets for surplus produce

			• RMA Tool kits	grasp product and market information			• Orient production to market demand (quantity, quality, processing…) • Facilitate a change in thinking from "production minded" to "market minded"
	Morning break						
	11.00–13.00		Consumer–producer assessment (Too1: Interview guide)	To develop behavioural attitudes (self-confidence, self-efficacy, proactiveness)	Case study Exploratory	• Explain the template for interview • Role playing	• Participants will act on "product value chain" as a case study • One group act as researchers and others as producers/ sellers
	Lunch break						
	14.00–16.30		• Design own interview guide	To appraise a grid of questions and aspects to be covered		• Participatory + Coaching	Groups are advised to think of a substitute in case the product chosen in the Business Model does not apply to the local market
Day 6	8.30–12.00	Rapid Market Appraisal (RMA)	• Administer the interview-guide	To practice primary data collection	Field research	• Participants visit the nearest town or marketplace	Various recording instruments can be used provided they are accepted by respondents and respect their privacy
	Lunch break						
	14.00–16.30	RMA	• Tool 2: Market mapping	Stimulate visual illustration of the market (supplier-producer-client)	Direct participation	Participants draw the market (map of their area)	The markets (sites, distance, products…) and not the resources are the centre of interest
Day 7	8.30–10.30	RMA	• Tool 3: Market path	To show how to follow a product from	Participatory + Reflective	Quantification and qualification of the added value along	Where appropriate researchers show the changes (+/-)

				the supplier gate to the client		the chain of product	
	Morning break						
	11.00–13.00	RMA	Marketing +Sales	To capture the role of a marketing and sales officer	Role playing + Reflective	3 sellers try to attract buyers among the rest of the group (30min)	• A set of training materials + small items purchased • Three participants act as sellers • Training room materials used for setting the stages
	14.00–15.30		Presentation and discussion of the integrated business model	Figure out complexities linked to market/product/ service appraisal	Interactive + Reflective	• Q&A • Critiques and observations	• Participants discuss what went right and wrong
	15.30–16.30	Checking progress in PECs	Assessing PECs	Assess the progress in PECs awareness and abilities	Individual assignment	Filling the questionnaire	• For PECs, request learners' honesty and realism in assessing strong areas and where they need help.

Annex 3: Company description Plan Preparation Form

Use this information as the basis of your plan's Company description section

List facts about your business according to the categories below

Names

Legal/Corporate name :

Doing business as :

Brand/Trade/Domani names :

Subsidiary companies :

Legal form

Legal form of business :

State incorporated (if incorporated):

Country in which business is licensed:

Owners of company or major shareholders:

Management/Leadership

Chairperson of the Board :

President :

Chief executive officer :

Other key management members:

Governing/Advisory bodies :

Number of members :

Location

Company headquarters :

Place of business :

Branches :

Geographic area served :

Development stage

When company was founded :

Stage of formation or immediate goals:

When product/service was introduced:

Progress of current plans and milestones reached:

Other development indicators:

Financial status

Last year's total sales :

Last year's pretax profit:

Sales and profitability by division or product line

Current number of employees:

Amount of funds sought:

Basic use of funds sought:

Previous funding and major financial obligations;

Product and services

General product/service description :

Number and types of lines :

Number of products or services in each line:

Patents and licenses

Patents held/pending :

Trademarks held/pending :

Licences held/pending :

Copyright held/pending :

Annex 4: Demographic, lifestyle and psychographic description of the target market

Demographic description	
Consumer	**Business**
Age range	Industries
Income range	Sector
Sex	Years in business
Occupation	Company revenues
Marital status	Number of employees
Family size	Number of branches
Ethnic group	Square footage
Level of education	Company ownership
Home ownership	Other
Other	
Lifestyle /business-style description	
Family stage	Business stage
Vacation choices	Employee relations
Television shows watched	Trade association membership
Favourite websites	Business products and services used
Hobbies/sports/other forms of entertainment	Workforce type
Publication subscriptions	Publication subscriptions
Organization/affiliations	Community activities
Political affiliation	Management style
Type of car owned	other
Other	
Psychographic description	
Technically adept	Technically advanced
Status seeking	Industry leader
Trend setting	Innovative
Conservative/responsible	Conservative/responsible
Social responsible	Social responsible
Environmentally conscious	Environmentally conscious
Smart sHoper	Smart business operator
Family oriented	Fiscally prudent
Fun seeking	Good manager of employees
Good housekeeper	Influenced by leading companies
Other	Other

Source: Rhonda, 2010, p.90, 92, 93.

Annex 5: Marketing Vehicles and Marketing budget

Marketing Vehicles	**Specifics**	**Frequency**	**Cost per year**		
			January…	**December**	**Total ($)**
Professional assistance					
• Marketing/PR consultants					
• Advertising agencies					
• Direct mail specialists					
• Graphic design/webdesign					
Brochures/Leaflets/flyers					
Signs/Bilboards					
Merchandising displays					
Sampling/Premiums					
• Media advertising					
• Print (newspaper, etc.)					
• Television and radio					
• Online					
• Other media					
Phone directories					
Advertising specialties					
Direct mail					
Website					
• Development/programming					
• Maintenance and hosting					
Trade shows					
• Fees and set up					
• Travel/shipping					
• Exhibits/signs					
Public relations activities/Materials					
Informal marketing/Networking					
• Memberships/meeting					
• Entertainment					
Other					
TOTAL					

Source: Adapted from Rhonda, 2010, p.138 and148

Annex 6: Start-up costs

List specific details of the start-up cash requirements. Remember these are expenses planned to be incurred before the launch of the business. Post-launch expenditures should be entered in the Income statement.

Category	Item	Cost ($)
Facilities	Land purchase	
	Building purchase	
	Initial rent	
	Deposits (Security/Utilities/etc)	
	Improvements/Remodelling	
	Other	
Equipment	Furniture	
	Production machines/Equipment	
	Computers/Software	
	Cash registers	
	Telephones/Telecommunications	
	Vehicle	
	Other	
Materials/Supplies	Office supplies	
	Stationery/Business cards	
	Brochures/Pamphlets, other descriptive material	
	Other	
Fees and other costs	Licenses/Permits	
	Trade or professional memberships	
	Attorneys	
	Accountants	
	Insurance	
	Marketing/ Management consultants	
	Design/Technical consultants	
	Advertising/Promotional activities	
	Other	
TOTAL		

Source: Rhonda, 2010, p.176

Annex 7: Income statement

Income statement can be Historical, Annual by month/ Quarter/For five years

For year: …….	**January**	**February…**	**November**	**December**	**Total ($)**
INCOME **Gross sales**					
(Commissions)					
(Returns and allowances)					
Net sales					
(Cost of goods)					
GROSS PROFIT					
EXPENSES- General and Administrative					
Salaries and wages					
Employee benefits					
Payroll taxes					
Professional services					
Rent					
Maintenance					
Equipment rental					
Furniture and equipment purchase					
Depreciation and amortization					
Insurance					
Interest expenses					
Utilities					
Telephone service					
Office supplies					
Postage and shipping					
Marketing and advertising					
Travel					
Entertainment					
Technology					
Other					
TOTAL EXPENSES					
Net income before taxes					
Provision for taxes on income					
Net income after taxes (net profit)					

Source: Rhonda, 2010, p.252

Annex 8: Cash flow statement

Cash flow can be History, Annual by Month/ Quarter/For five years

For year……	**January**	**February …**	**November**	**December**	**TOTAL**
CASH RECEIPTS **Income from sales**					
Cash sales					
Collections					
Total cash from sales					
Income from financing					
Interest income					
Loan proceeds					
Total cash from financing					
Other cash receipts					
TOTAL CASH RECEIPTS					
CASH DISBURSEMENTS					
Expenses					
Cost of goods					
Operating expenses					
Commissions/ returns and allowances					
Loan payments					
Income tax payments					
Other expenses/Equipment purchase					
Reserve					
Owner's draw					
TOTAL CASH DISBURSEMENTS					
NET CASH FLOW					
Opening cash balance					
Cash receipts					
Cash disbursements					
ENDING CASH BALANCE					

Source: Rhonda, 2010, p.260

Annex 9: Balance sheet

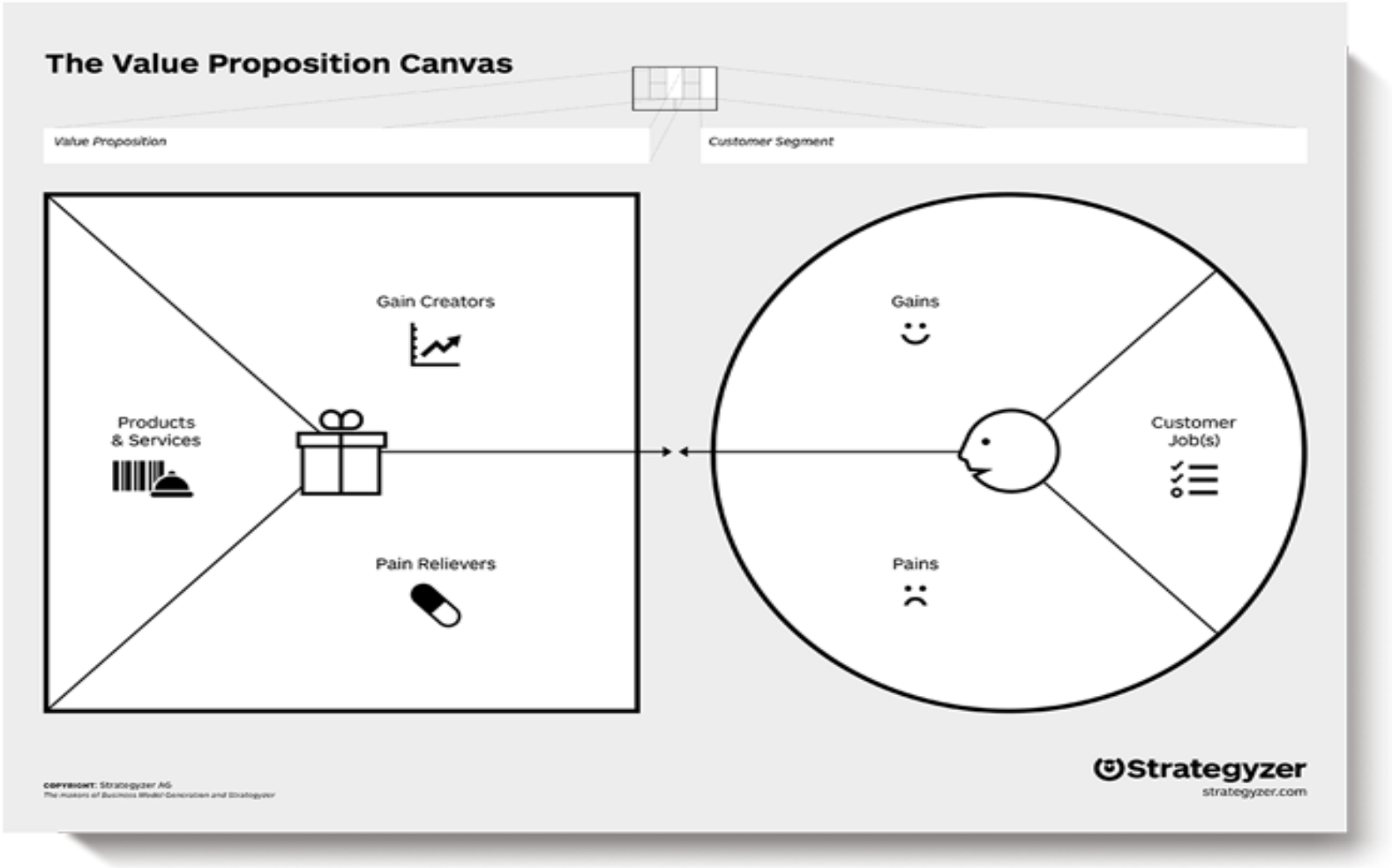
For company……

For period:…….Ending……., 20…

ASSETS	Amount ($)	Amount ($)	Amount ($)
Current assets			
Cash	$$$$		
Accounts receivable	$$$$		
Inventory	$$$$		
Prepaid expenses	$$$$		
Total current assets		$$$$	
Fixed assets			
Land	$$$$		
Buildings	$$$$		
Furniture/equipment	$$$$		
Fixtures	$$$$		
(Less accumulated depreciation)	$$$$		
Total fixed assets		$$$$	
Other assets	$$$$		
TOTAL ASSETS			$$$$
LIABILITIES			
Current liabilities			
Accounts payable	$$$$		
Accrued payroll	$$$$		
Taxes payable	$$$$		
Short-term notes payable	$$$$		
Total current liabilities		$$$$	
Long-term liabilities			
Long-term notes payable	$$$$		
Total long-term liabilities		$$$$	
Net worth			
Shareholders' equity	$$$$		
Retained earnings	$$$$		
Total net worth		$$$$	
TOTAL LIABILITIES AND NET WORTH			$$$$

Source: Rhonda, 2010, p.265

Annex 10: Value proposition canvas



Annex 11: Structure matrix

Structure Matrix								
	Component							
	1	2	3	4	5	6	7	8
RISK TAKING								
I am highly committed to exploration of new areas							.701	
I highly value choosing a profitable opportunity with risky alternatives than a safe opportunity with less profit						.776		
I prefer doing things differently from generally accepted standard						.770		
I have confidence in my ability to succeed despite challenges					.428	.499		.423
PROACTIVENESS								
I always look for establishing new relationships								.564
I am committed to developing healthy relationships							.584	
I very often talk business topics with my peers				.780				
I am committed to taking initiative and pursuing new opportunities				.762				
I try my level best to be first to market or first to imitate	.567		.549					
I am highly committed to achieving my goal			.476				.453	.500
AUTONOMY								
I am very self-directed in the pursuit of opportunities		.818						
I am able and put forward to function independently		.772						
I rarely depend on others' approval for executing assignment		.574						.479
I am not worried to leave secure positions in order to promote novel ideas or venture into new fields	.527		.455					
INNOVATIVENESS								
I am always attracted by creativity					.796			
I am always more interested in value of achievement than money	.758							
I often have the tendency to support new ideas	.551				.422			
I spend most of my time thinking on novelty	.771							
I often show high interest in experimentation								.637
COMPETITIVE AGRESSIVENESS								
I am always committed to seeking new opportunities							.419	
I am convinced that success comes with hard work					.763			
I rarely give up until my idea becomes a reality			.622					
I keep trying no matter the number of failures in the process			.792					
I am happy and comfortable in a leading position		.590	.489					
Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.								

Annex 12: Questionnaire in English

QUESTIONNAIRE: Measuring students' progress in entrepreneurial orientation

Instructions

1. This questionnaire is intended for students in the Departments of Civil Engineering……...Land Survey……..Biotechnologies……
2. The purpose of this questionnaire is to assess individual personal entrepreneurship potential and how it can effectively develop to produce a student with enterprising behaviour (creative, proactive, risk-taker) needed in the market.
3. You are requested to be honest as possible because there is no judgment of their results.
4. You are requested to realistically identify and assess areas where they feel strong and where they need help. Once finished areas of weakness can be developed over time with proper training, education, skill development, practice and experience – and then have a great foundation for entrepreneurship.
5. You express self-appreciation for the following dimensions. Indicators are measured through the Likert scale (1 = Strongly disagree, 2 = Disagree 3 = Disagree a bit, 4 = Neutral, 5 = Agree a bit, 6 = Agree, 7 = Strongly agree).
6. It takes 10 minutes to the maximum.
7. The answers are treated with confidentiality and results are used for training purposes.

Part1: Demographic information

1. Age: ……..
2. Gender: Female……. Male…….
3. Habitat: Rural…… Urban……...
4. Membership of groups/association: Business oriented…Not business oriented….No group…
5. **Individual's external entrepreneurial influence**
    - Relatives who are entrepreneurs
    - Colleagues who are entrepreneurs
    - Neighbors who are entrepreneurs

Part2: Personal Entrepreneurship Potential

Notice 1: Before training: As a person who has not attended entrepreneurship training, how do you appreciate your potential in entrepreneurship?

Notice 2: After training: How do you judge your potential in entrepreneurship after you have attended the last entrepreneurship training?

Dimension	Perception	1	2	3	4	5	6	7
1. Risk-taking	1. I am highly committed to exploration of new areas or visiting new sites							
	2. I highly value choosing a profitable opportunity with risky alternatives than a safe opportunity with less profit							
	3. I prefer doing things in a way that is sharply different from a traditionally or generally accepted standard							
	4. I have confidence in my ability to succeed despite challenges							
2. Proactiveness	5. I always look for establishing new relationships							
	6. I am highly committed to developing healthy and mature relationships							
	7. I try my level best to be first in the market or first to imitate							
	8. I very often talk about business topics with my peers							
	9. I am committed to taking initiative and pursuing new opportunities							
	10. I have a high level of personal commitment to achieving my goal							
3. Autonomy	11. I am very self-directed in the pursuit of opportunities							
	12. I am able and prefer to function independently							
	13. I rarely depend on others' approval for the execution of assignment							
	14. I am not worried to leave secure positions in order to promote novel ideas or venture into new fields							
4. Innovation	15. I am always attracted by creativity and opportunism							
	16. I am always interested more in the value of achievement than money							
	17. I often have the tendency to engage in and support new ideas							
	18. I spend most of my time thinking about novelty							
	19. I often show high interest in experimentation and creative processes							
5. Competitive aggressiveness	20. I am always committed to seeking new opportunities							
	21. I rarely give up until my idea becomes a reality							
	22. I keep trying and trying no matter the number of failures in the process							
	23. I am happy and comfortable in a leading position							

Annex 13: Questionnaire in Kinyarwanda

Urutonde rw'ibibazo: Gusuzuma imyumvire y'abanyeshuri n'intambwe batera mu mitekerereze yo guhinduka rwiyemezamirimo

Amabwiriza

8. Ibi bibazo bigenewe abanyeshuri mu mashami yigisha Ubwubatsi, Gupima ubutaka n'Ikoranabuhanga mu biribwa n'ibinyobwa.
9. Intego y'ibi bibazo ni ugusuzuma ikigero umuntu yiyumvamo ubushobozi mu bijyanye no kwihangira umurimo n'uko bwakongerwamo ingufu mu kugira umunyeshuri wifitemo iyo myitwarire ikenewe ku isoko.
10. Usabwa kugaragaza ukuri gushoboka kuko nta suzumabumenyi riteganyijwe nyuma
11. Usabwa kugaragaza no gusuzuma neza aho wumva uhagaze neza n'aho wumva ukeneye ubufasha. Ahakenewe ubufasha hashobora gushyirwa imbaraga binyuze mu mahugurwa yabugenewe uko yagenda atangwa, mu bumenyi-ngiro no kongera ubunararibonye kugirango habe umusingi uhamye mu byo kwihangira umurimo.
12. Garagaza uko wiyumva mu byiciro bikurikira hagendewe kuri ibi bipimo: 1 = Sinemeranya na busa, 2 = Sinemeranya, 3 = Sinemeranyaho gato, 4 = Ndifashe, 5 = Ndemeranyaho gato, 6 = Ndemeranya, 7 = Ndemeranya cyane.
13. Ibazwa ntirirenza iminota 15 gusa.
14. Ibisubizo bizabikwa mu ibanga kandi bizakoreshwa mu nyungu z'amasomo gusa.

Igice cya mbere: Irangamimerere

6. Imyaka: ……
7. Igitsina: Gore……. Gabo……
8. Aho atuye: Icyaro…….. Umujyi ……
9. Itsinda/Ishyirahamwe abarizwamo: Rigamije ubucuruzi…..Ritagamije ubucuruzi.....Ntaryo….
10. Ibyakururira umuntu kwihangira umurimo
    - Abo dufitanye amasano bari rwiyemezamirimo
    - Inshuti bari rwiyemezamirimo
    - Abaturanyi bari rwiyemezamirimo

Igice cya kabiri: Ibiranga ko umuntu yavamo rwiyemezamirimo

Icyitonderwa: Mbere y'isomo: Nk'umuntu utarigeze witabira andi mahugurwa ku kwihangira umurimo, ni gute ubona ubushobozi bwawe mu kuba wakwihangira umurimo?

Icyitonderwa: Nyuma y'isomo: Nyuma yo kwitabira amasomo ku kwihangira umurimo, ni gute wiyumvamo ubushobozi bwo kuba wakwihangira umurimo?

Nr	Ikibazo	1	2	3	4	5	6	7
Gukora ibyagira ingaruka	Mfite ubushake buhagije bwo gushakisha ahantu hashya							
	Mpa agaciro cyane amahirwe afite imbogamizi nyinshi ariko afite n'inyungu nyishi kurusha amahirwe yizewe ariko afite inyungu nkeya							
	Mpitamo gukora ibintu mu buryo butandukanye n'ubumenyerewe							
	Niyumvamo ubushobozi bwokugera ku ntego n'iyo habamo ingorane							
Kwegerana n' abandi	Mpora nshishikajwe no kubaka ubucuti bushyashya							
	Mparanira kubaka ubucuti burambye							
	Ngerageza uko nshoboye kuba uwa mbere ku isoko cyangwa kwigana							
	Nganira kenshi na bagenzi banjye ku bijyannye n'ubucuruzi							
	Mparanira gutera intambwe mu kwibwiriza no kubyaza umusaruro amahirwe mashya							
	Nshishikajzwa cyane no kugera ku ntego zanjye							
Kwigenga	Ndiyobora mu gukurikirana amahirwe							
	Nshoboye kandi nshyira imbere gukora mu bwigenge							
	Ni gake cyane ngendera ku byemezo by'abandi mu gukora ibyo nshinzwe							
	Sinterwa ubwoba no kuva ku kazi kizewe ngo nteze imbere ibitekerezo bishya cg ntangire ubundi buzima bushya							
Guhanga ibishya	Mpora nkururwa no guhanga igishya							
	Buri gihe nshyira imbere kugera ku ntego kurusha amafaranga							
	Mpora buri gihe numva nshaka gushyigikira ibitekerezo bishya							
	Mara umwanya wanjye munini ntekereza ku kintu gishya							
	Ngaragaza kenshi gushaka kugerageza ngo ndebe ko ibintu bikora							
Guhangana	Buri gihe nshishikazwa no gushaka amahirwe mashyashya							
	Simfa gucika integer kugeza igitekerezo cyanjye kibaye impamo							
	Nkomeza kugerageza ntitaye ku nshuro natsinzwe mu rugendo rugeza ku intsinzi							
	Nishimira kandi numva mpamye mu mwanya w'ubuyobozi							