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## **TEACHING 21<sup>ST</sup> CENTURY ENTREPRENEURIAL COMPETENCES USING A PROBLEM BASED APPROACH**

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### **Introduction**

“Throughout the world, shifts in populations, demographics, technology changes, fluctuating economies and other dynamic forces have transformed societies as never before, bringing new challenges and opportunities to the forefront, causing interest in entrepreneurship by governments and the public” (Xavier, Kelley, Kew, Herrington & Vorderwülbecke, 2012, p.6). Youth unemployment and under-employment have become key concepts for both the developed and developing world (Herrington & Kew, 2014). Due to the financial crisis of 2011 a considerable downturn in economic growth in most parts of the world is seen, with an increase in the levels of uncertainty within the business world. These changes have a far-reaching implication for the workforce and population at large, with many activities taken over by computers with subsequent job losses and increasing unemployment statistics (Allen & van der Velden, 2012). Youth unemployment is enormous with a quarter of the world’s young people (290 million) neither working nor studying. Amongst the employed youth many young people have only informal, temporary or unpaid family jobs resulting in almost half of youngsters between the ages of fifteen and twenty four being outside the formal economy (Xavier et al., 2013).

Due to the harsh picture painted above, it has become important to re-visit the entrepreneurship education (EE) and skills debate. The inclusion of entrepreneurial competencies as a generic skill in the 21<sup>st</sup> century skills debate has never been more critical. The field of entrepreneurship and EE are gaining prominence in a changing economy. Entrepreneurship in general proves to be popular in business schools, engineering schools, universities and educational institutions (Fayolle, 2013). This study focuses on the *how* or method to transfer entrepreneurial learnings and competencies. Using PBL (project based learning) in an entrepreneurship or business classroom is one option to reach the desired outcome. Therefore, the purpose of the study is to investigate if entrepreneurship concepts and skills can be transferred using a PBL approach linked to a real life event. PBL provides the students with an opportunity to experience, to apply theory in practice and receive feedback as they develop new abilities.

The study is qualitative in nature, using a single case study to capture the reflection of student experiences after the completion of a PBL intervention. A focus group discussion was held three years later to determine the long-term effect of the intervention. The results indicate that PBL enables students to become active participants in their learning and provide an opportunity to practically experience the entrepreneurial process. Mastery of more than entrepreneurial competencies and theory were reported as benefits gained including the seven core 21<sup>st</sup> century skills (Voogt & Pajera Roblin, 2010); the seven survival skills (Wagner, n.d.) as well as life skills.

## **Literature Review**

### **21<sup>st</sup> Century skills**

The term “21<sup>st</sup> century skills” is widely used in education but with different interpretations (Great Schools Partnership, 2014), often as synonym for use of technology. The paper joins the 21<sup>st</sup> century skills debate in an attempt to emphasise a teaching method that is able to convey rigorous essential skills needed to assist young people to create or find employment in a rapidly changing global landscape. This is in line with Wagner (n.d.) who argues that 21<sup>st</sup> century rigour is about creating new knowledge and applying what you know to new problems and situations. The current debate focuses on adding entrepreneurial competencies as a vital skill in the current economic climate.

### **Entrepreneurship education (EE)**

According to Fayolle (2013) EE is seen as the crossroads of entrepreneurship and education. Jones & Penaluna (2013) define EE as equipping students with the additional knowledge, attributes and capabilities to apply in the context of setting up a new venture business. There is however, a need for a clear and accurate combination of knowledge from both fields in order to come up with intellectual and conceptual models to strengthen entrepreneurship courses (Paloniemi & Belt, 2014). The constant changing world and business environment have important consequences for entrepreneurial learnings and competencies, needed to effectively function in modern societies. It requires innovative entrepreneurial competencies, thus moving away from only knowing facts to a way of thinking and acting (Gibb, 1993; Paloniemi & Belt, 2014). Tang, Lai, Chou and Chen (2014) argue that the realm between entrepreneurship activities and national economic development is inseparable, postulating that EE can elevate national entrepreneurship standards and innovative abilities of individuals. Furthermore, using a PBL approach linked to EE provides an opportunity for the development of cross-disciplinary skills (Great Schools Partnership, 2014)

For the purpose of this study an attempt is made to close the gap between what we teach and what entrepreneurs do. The window of opportunity as an organising principle assists students in experiencing the different activities an entrepreneur has to think through and overcome. It is divided into five phases namely seeing, locating, measuring, opening and closing the window (Nieman & Nieuwenhuizen, 2014). Students apply theory in practice, while learning involves the construction of a product or artefact (Helle, Tynjälä & Olkinuora, 2006; Sims,

2014). This is in line with the four different worlds on which EE can be based, namely the entrepreneur, process, cognition and method (Neck & Greene, 2011).

### **Project-based Learning (PBL)**

EE teachers often face difficulties in finding content and methods to support their everyday teaching PBL is an innovative teaching approach getting students collaboratively and actively involved in planning, developing and accessing a project that has a practical outcome. It is also well documented that PBL has grown in popularity as an approach over the last two decades. It is widely implemented with impressive results in student achievement, problem-solving capabilities, communication and understanding, and allows opportunity for collaboration, dealing with an authentic problem and engaging with the community (Rotterham & Willingham, 2010).

This method is based on an interest or real initiative where students discuss their interest and views (giving each other advice), develop their own activity scope (planning and decision-making) and reflect on their own learning processes (Lepe & Jimenez-Rodrigo, 2014). It puts student engagement and persistence to the test, requires students to participate willingly in a meaningful activity that starts with a problem and end in a product or artefact. Students function in small groups or teams and control the learning process while lecturers act in an advisory role (Bédard, Lison, Dalle, Cote & Boutin, 2012; Sims, 2014). It helps students to develop more autonomy and responsibility as well as self-awareness about the value of these student-centred actions (Bédard et al., 2012). PBL is seen as an approach to convey both content and skill in a rich way that genuinely improves outcomes for students (Rotterham & Willingham, 2010). Linking an authentic problem to be investigated and solved in an entrepreneurship and business classroom, allows the opportunity to prepare students for the modern workplace and adult life and enhance their adaptability to function in a modern economy (Great Schools Partnership, 2014).

This leads to the formulating of the research question namely: Can theory and skills be taught using a PBL intervention in an entrepreneurial classroom.

### **Teaching methodology and context**

The study was done in a first year business management degree course at the University of Pretoria. The duration of the course was 28 weeks, with the first 14 weeks focusing on business management as a value chain approach and the second 14 weeks focusing on entrepreneurship. The number of students enrolled for the course was 2500. The course was facilitated and managed by a senior lecturer with the help of nine lecturers. The topics covered in the course was: the nature and development of entrepreneurship; the entrepreneur, creativity and innovation; the window of opportunity, business plan; resource requirements and other important consideration when starting a business. The students had three contact sessions of fifty minutes per week. The activities used in the PBL intervention included both theoretical and practical components with the opportunity for students to plan, act and execute from their own perspective (Laurillard, 2012; Sims, 2014). The project depended on

the use of technology, to do research, use social media for student contact, as well as the LMS (WebCT) for e-learning components.

The project design followed the basic structure suggested by Larmer and Mergendoller (2010) who postulate that a meaningful project should include seven essential activities. These are (i) a need to know, (ii) a driving question, (iii) student voice and choice, (iv) 21<sup>st</sup> century skills, (v) inquiry and innovation, (vi) feedback and revision and (vii) a publicly presented product. However, reflection was added as the final step of the project design. The intervention design allowed students the opportunity to hone their entrepreneurial competencies while participating, interacting, making decisions and receiving feedback (Rönkkö & Lepistö, 2013). The design is as follows:

First as a need to know the students were introduced to the project with a case study and video, telling the story of a real entrepreneur who revived the Startas sneaker brand. All course content was based on, illustrated by and linked to this case study. The home page was designed as a continuous reminder of the project, and each time students opened the site, a funky Startas sneaker banner would move across the screen, while Nancy' Sinatra's song "These boots are made for walking" (1966) played in the background .

Second, more than one driving question was posed to guide the project and are mentioned in chronological order: design a sneaker from recycled material for an exhibition (individual assignment); raise money to pay for the white sneakers, decorations and printing cost of the pocket guide (cross-disciplinary); design a pattern for a white/ black/ navy sneaker that represents something uniquely South African; write a pocket guide that documented the process using as organising principle the window of opportunity; present the pocket guide and final designed sneakers to a panel of evaluators; reflect (written response) on their project experience.

Third an attempt was made to give students a voice and choice. Students received a study guide with all the project information, due dates for tasks to be handed in, as well as assessment rubrics to guide their progress. However, how they achieved the outcomes, how they raised money, the design and material used in the recycled shoe, the target market for the designer sneaker, the positioning in the market of the sneaker and the format and the design of the pocket guide were all according to their own planning, time table and preference. To make sure students were not financed by their parents or other personal sources, students had to present how they earned the money, as well as an income/ expense statement.

Fourth in order to enhance competencies and skills, students formed and enrolled online in groups to collaborate and work together. They communicated using social media and email; they used technology such as search engines for their research and to help find answers to the questions "who is my target market / competitors" and "where do we position ourselves in the market". The students were creative in designing the shoe, raising money, deciding on a design for the sneaker and creating the pocket guide. Students were required to do market research and to move from the idea phase to a real product. Doing market research assisted

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them in deciding on their target market as well as where to position their group's sneaker in the shoe market.

Fifth inquiry and adaptability formed a huge part of the success of the project. The last contact session of each week was used to consult with lectures and peers, raise problems and concerns which cropped up during the week. The fact that these were immediately addressed, resulted in clarity of what needs to be done, eliminated stress and stumbling blocks that hampered their progress. It also allows them time to adapt if they missed certain tasks or steps. Groups posed questions via email to be addressed in class in order for all to learn and benefit from the discussion.

The sixth step required feedback and revision: Once a week during the class discussions, students received feedback on their progress to date. All questions and work were related to the given case study as well as the applicable theoretical concepts of entrepreneurship. This allowed for both theory and practise to be addressed.

The seventh step was the slide show presentation of the overall project as well as the evidence of the required outcomes (physical shoes, pocket guide, income/expense statement etc.) to a panel of lecturers and peers.

Last, reflection was added to ascertain whether the theory became concrete, tangible and applicable. Reflection as a process of engaging with learning provided opportunity for critical evaluation of learning in order to develop professional knowledge, understanding and deeper learning. It is transformational in nature, is empowering, enlightening and ultimately emancipatory Blignaut (2014). Students reflected individually on their experience of the PBL intervention after completion of the project but submitted the reflections as a group report. A focus group interview to reflect on the long-term benefits if any of the intervention was held three years later.

### **Research methodology**

The research approach in this study is qualitative. The information gathered was used to create new patterns of understanding and share the findings for further discussions. The following procedure was followed in the research: First the respondents reflected on their project experience after completion of the project, captured in a written report. An open ended question guided the reflection. Each member of the group recorded his or her individual written response but the groups submitted the responses in as one report. Students worked in groups of five but due to logistical issues such as place of residence and transport difficulties, a few groups consisted of four or three members. Second, a random sample of 80 out of 350 groups was selected resulting in 384 perceived experiences. After 80 written reports were analysed, a point of saturation was experienced with no new information being added. Third, all sampled reflections were coded manually, reading and marking line by line to determine entrepreneurship learning and perceived skills gained. Lastly, to ensure that the research is trustworthy and transparent, the researcher had two independent researchers review the coding. Based on their reviews, refinements were made where indicated. A focus

group interview was held 3 years later with eight students who had taken part in the intervention to determine if any of the competencies gained were being used in their current working situation. The information gathered was used to create new patterns of understanding and to share the findings for further discussions. The rest of the paper deals with the discussion of findings, conclusion as well as the recommendations and limitations of the study.

## Findings and discussion

The findings report student reflections and learnings perceived as benefits gained from taking part in the PBL intervention, analysed qualitatively, using the four worlds of EE as suggested by Neck & Greene (2011) as organising framework to determine if this intervention covered the four worlds of EE.

The first component of the four worlds of EE deals with the *method of teaching* entrepreneurship. Students reported positively on the PBL as a teaching method in entrepreneurship. Students mentioned that they gained much more from this project than any other theoretical course. It was practical, helped them to **understand** and **embrace diverse cultures**, improved their **communication and interpersonal skills** and improved their ability to **solve problems** and **work together** in a team. Students reported: “We were **curious to learn and experience** more” and “After completion of the project we could not believe how wild our **imagination** has run”.

The second component deals with *the entrepreneur*. Students reflected on the experiences of being an entrepreneur and stepping into the shoes of an entrepreneur. They mentioned developing an **entrepreneurial mind set**; of having a better **understanding and insight in the entrepreneur** and **the entrepreneurial processes** as well as some **entrepreneurial traits** such as hardworking and persistence. Doing the presentation made them aware of how important **public speaking** is to pitch their product or talk to financiers. They also experienced challenges: “It was difficult to **manage our time** spent on the project and our other subjects” and “**Raising money, doing our income/ expenditure** and staying within **our budget** were all eye openers”.

The third component deals with the *cognitive world* of EE. Students reflected on learning about the **content** of entrepreneurship while doing. They argued that the **practical experience and application** made it easier to understand the **theory and concepts** driving entrepreneurship and what entrepreneurship in general is about. Using **critical thinking** to do **research and access information**, find their **target market**, doing **research and positioning** their product gave them better understanding and **practical experience of difficult theoretical concepts**.

The last component of the world of EE involves the *entrepreneurial process*. The project was linked to the window of opportunity as the organising principle to guide students through the steps and tasks of the project. Students reported that the **window of opportunity gave them a**

**tool** to learn about the tasks needed to open a business; gave them **a clear business system to experience** and **understand the entrepreneurial process**. After making mistakes, they adapted: “Although we made **many mistakes** and had to **start over and adapt** and being **innovative and creative**, we persisted”. They recognised new potential: “Doing all the activities in the entrepreneurial **process opened our eyes for the opportunities** around making us **alert (agile)** to possibilities”.

Both content and skills were reflected upon. Students’ reflections of perceived benefits of the PBL intervention did not only include entrepreneurial learnings and competencies but also the seven core 21st century skills (Voogt & Pajera Roblin, 2010) as well as the seven survival skills (Wagner, n.d.). Working together and dealing with their emotions, the improvement of their communication skills, critical thinking, ICT skills, creativity, problem solving as well as social and cultural skill, agility, accessing information, curiosity, imagination, adaptability and many more were mentioned as well as life skills. However, though these skills were identified in the reflections, it is not the purpose of this study to probe deeply into 21<sup>st</sup> century and other skills.

The outcome of the focus group confirmed that the intervention had long-term benefits. Two of the respondents were self-employed and mentioned that doing the project developed their ability to scan the environment and look for opportunities. They also referred to their ability to take calculated risks because they understood and experienced the entrepreneurial process. One of them mentioned that he still uses the window of opportunity as a guiding principle. The other six respondents were working in the formal employment sector. They mentioned the benefits they gained from working in a group, understanding others, adapting to new situations and their ability to critically look at their environment and work content. One mentioned her ability to plan, organise and execute because of the lessons learned through the many project tasks and the time limits experienced. All of them said that they constantly look for possible opportunities to start their own initiatives.

The study therefore concludes that a PBL approach in an entrepreneurship classroom tick all the boxes for covering the four different worlds on which EE is based. Students reflected on the PBL approach (method) as well as the entrepreneur, entrepreneurial learnings and competencies (cognition) and the entrepreneurial process, as indicated by underlining of key concepts that overlap with the four EE worlds. Some of the topics covered included creativity, managing time, work-life balance, trying again after failure, persistence, working together and managing group emotions and problems. This is in line with Fayolle (2013) who argues the need for the incorporation in entrepreneurial practices of softer entrepreneurial topics such as entrepreneurial mind set, opportunity construction, work-life balance, managing emotions and learning from failure. Many other competencies were also mentioned such as raising money, staying within your budget, book keeping, embracing different cultures which confirm that the PBL intervention in entrepreneurship can achieve cross-disciplinary skills needed in the twenty first century.

Entrepreneurial competencies as part of a skills set to prepare students for the twenty first century workplace and job creation in the current global economy has become evident over the last twenty years, as described by 7 generic skills and 7 survival skills. More important is the teaching method to cover both content and entrepreneurial competencies so needed in a fast changing economy and the world of work. The PBL approach in the entrepreneurship classroom and EE can achieve entrepreneurial learnings and competencies as well develop generic cross disciplinary skills needed to succeed and function in the 21<sup>st</sup> century working environment. Based on the above support is presented for the research question: “Can entrepreneurship theory and skills be taught using a PBL intervention in an entrepreneurial classroom?”

## **Conclusions and recommendations**

The value of the PBL intervention reaches far beyond the classroom and gives the students valuable insight into the action, processes and activities of an entrepreneur. Therefore, using an innovative PBL approach has the ability to assist students to develop an understanding of the entrepreneurial process while also nurturing competencies needed for their future working lives. However, the basic objective of EE is to create an awareness of entrepreneurship and entrepreneurial thinking to enable individuals to consider self-employment as an option. The study concludes that a PBL approach linked to a real life problem gives the students an opportunity to hone their entrepreneurial competencies while they participate, interact, make decisions, work together solve problems, take risks, research, accept mistakes but also receive feedback (Rönkkö & Lepistö, 2015). Linked to the suggested project design (Larmer & Mergendoller, 2010) and the EE teaching model (Neck & Green, 2011) the PBL intervention in an entrepreneurship classroom not only gives an effective method and teaching pedagogy (how) to achieve both entrepreneurial learnings and competencies but also nurture generic and survival skills across disciplines.

The study has implications for both educators and practitioners. A PBL approach linked to an authentic task benefit students by exposing them to the world of work and practice. It can be applied across disciplines and is therefore ideally suited in many higher education subject areas. It also helps students to understand and develop not only content but also 21<sup>st</sup> century skills needed in today’s competitive working environment. The study confirms the notion that education is capable of making a significant contribution to the development and empowerment of individuals to ensure a well-rounded worker enters industry.



### References

1. Allen, J. and van der Velden, R. (2012). Skills for the 21<sup>st</sup> Century. In *Implication for Education, Maastricht University*, (pp. 1-47).
2. Bédard, D.; Lison, C.; Dalle, D.; Cote, D. and Boutin, N. (2012). Problem-based and project-based learning in engineering and medicine; Determinants of student engagement and persistence. In *Interdisciplinary Journal of problem-based Learning*, 6(2).
3. Blignaut, S.E. (2014). Reflections on student resistance to a constructivist curriculum. In *Education as Change*, (pp. 1-13).
4. Fayolle, A. (2013). Personal views on the future of entrepreneurship education. In *Entrepreneurship & Regional Development: An international journal*, 25(7-8), (pp. 692-701).
5. Gibb, A. (1993). Enterprise culture and education. Understanding enterprise education and its links with small business, entrepreneurship and wider educational goals. In *International Small Business Journal*, 11(3), (pp. 11-34).
6. Great Schools Partnership (2014). 21<sup>st</sup> Century skills. In *The Glossary of Education Reform*. Retrieved from <http://edglossary.org/21ST-CENTURY-SKILLS/>
7. Helle, L.; Tynjälä, P. and Olkinuora, E. (2006). Project-based learning in post-secondary education- theory and practice and rubbersling shots. In *Higher education*, 51(2), (pp. 287-314).
8. Herrington, M. and Kew, J. (2014). *GEM South Africa 2013 Report*. Retrieved from <http://www.gemconsortium.org/docs/3336/gem-south-africa-2013-report>
9. Larmer, J. and Mergendoller, J.R. (2010). Seven essentials for project-based learning. In *Educational Leadership*, 68(1), (pp. 34-37).
10. Laurillard, D. (2008). *Teaching as a design science: Building pedagogical patterns for learning and technology*. NY: Routledge
11. Neck, H.M. and Greene, P.G. (2011). Entrepreneurship education: known worlds and new frontiers. In *Journal of small business management*, 49(1), (pp. 55-70).
12. Nieman, G. and Nieuwenhuizen, C. (2014). *Entrepreneurship: A South African perspective*. Van Schaik Publishers, 3<sup>rd</sup> ed., (pp. 101–111).
13. Paloniemi, K.J. and Belt, P. (2014). *Incongruence in entrepreneurship teacher's assumptions about entrepreneurship and pedagogical methods*. Presented in Entrepreneurship education conference. Seinäjoki, Finland. 25-26 September, 2014. Theme: Enterprise education Vol.2.
14. Rönkkö, M.-J. and Lepistö, J. (2013). Finnish critical conception of entrepreneurship education. In *Journal of Enterprising communities: People, places in the global economy*, 9, (pp. 1-19).

15. Rotterham, A.J. and Willingham, D.T. (2010). 21<sup>st</sup>-Century skills. Not new, but a worthy challenge. In *American Educator*, (pp. 17-20).
16. Sims, R. (2014). *Learning design or design alchemy*, (pp. 79-91). Springer.
17. Tang, M.-S.; Lai, W.-H., Chou, Y.-C. and Chen, C.-S. (2014). The similarities and differences between entrepreneurship education in Taiwan, Europe, and China: A preliminary study. In *2014 proceedings of PICMET \*14: Infrastructure and service integration*, (pp 1565-1568).
18. Voogt, J.; Pajera Roblin, N. (2010). 21<sup>st</sup> century skills. In Discussienota Twente: Twente Universiteit Twente afdeling Curriculum en Onderwijsinnovatie.
19. Wagner, T. (n.d.). *Tony Wagner's seven survival skills*. Retrieved 30/3, 2015, from <http://www.tonywagner.com/7-survival-skills>
20. Xavier, S.R.; Kelley, D.; Kew, J.; Herrington, M. and Vorderwülbecke, A. (2012). 2012 Global Report. In *Global Entrepreneurship Monitor*. Retrieved 30/3, 2015 from <http://www.gemconsortium.org/docs/download/2645>