

Entrepreneurial Learning and Doing:

A review of recent literature on entrepreneurial learning

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# Executive Summary

A growing body of scholarly literature highlights the need to prepare young people for future economic, social and educational success by developing the knowledge and skills required for successful entry into the workforce. Teaching and cultivating entrepreneurship is seen as an important learning process in 21st century education. Entrepreneurial learning falls within the ambit of the General Capabilities and Work Studies Years 9-10 in the Australian Curriculum as well as vocational learning as defined in the national Education Council’s report (2014).

Team members have examined recent literature addressing youth entrepreneurial learning to identify important trends in entrepreneurial learning and how it can be utilised to instil lifelong skills and capabilities among all young learners in Australian school environments.

Several countries have implemented entrepreneurial learning programs with the objectives of enhancing learners’ awareness of career options, self-employment, developing personal qualities, traits and behaviour among individuals that help them to become informed and responsible citizens. Entrepreneurial learning also closely connects with science, technology, engineering and mathematics (STEM) education. Today, almost all industries extensively rely on scientific and technological knowledge, which determines economic growth, quality of life, health and security.

Learning the skills of entrepreneurship assists young individuals in making successful transition from the schooling environment into the workforce. Individuals who have the opportunity to think creatively, problem-solve, innovate and manage complex projects, have a greater chance to grow, succeed and operate in a rapidly changing global market.

Entrepreneurship is the ability to design, implement, manage and complete a strategic, business or an organisational innovation. Entrepreneurial skills include developing and selecting ideas, turning good ideas into viable products, processes and services, implementing a business process that deals with human, financial, intellectual and financial resource management as well as enabling soft skills such as leadership, team building and communication.

The entrepreneurship learning process involves two different components: the first aiming at instilling general concepts of entrepreneurial skills to inculcate entrepreneurial attitudes and behaviour among individuals; and the second aiming to enhance entrepreneurial knowledge and skills for the creation of new businesses. Both these components converge to instil a broader spectrum of learning and skills that are necessary for young learners to combine various subject matter they learn to synthesise new and creative ways of engaging with learning. This will allow them to prepare themselves for future employment challenges.

The *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA 2008) identifies essential skills for 21st century learners – in literacy, numeracy, information and communication technology (ICT), thinking, creativity, teamwork and communication. It is intended to enhance the quality of educational delivery in Australian schools to actively support the development of confident and successful individuals who can:

* manage their own wellbeing,
* relate well to others,
* make informed decisions about their lives,
* become citizens who behave with ethical integrity,
* relate to and communicate across cultures,
* work for the common good and act with responsibility at local, regional, national and global levels.

Some of the highlights of this literature review are summarised below:

* Entrepreneurial learning is multi-faceted and contextual. While many nations search to improve their social, financial and cultural capital, some countries have moved more vigorously towards innovation and entrepreneurial learning. Others move with considered hesitancy., Those who hesitate are failing to adopt practices that will require sustained and continued development to realise national and global benefits.
* Learning about entrepreneurship involves developing knowledge, skills, attitudes and personal qualities appropriate to the age and development of the learner from primary school throughout life. Entrepreneurial learning can be taught as a separate subject, part of the national curriculum, part of vocational learning provided by schools or as an extra-curricular activity.
* The attributes of problem-solving, innovation, creativity, collaboration and risk-taking are vital 21st century learning areas that are essential to strengthen innovation and entrepreneurship. The Australian government recognises the importance of entrepreneurial learning as discussed in Y20 Australia in connection with the G20 in the 5th annual edition of the G20 Young Entrepreneurs Alliance Summit. This summit urged all governments to focus on entrepreneurship and agreed to implement policies, legislation and incentives for ecosystems that support young entrepreneurs.
* Educational institutions need to prepare for planningand resourcing initiatives to cultivate entrepreneurial learning and an entrepreneurial mindset.
* Literature suggests a strong case for entrepreneurial learning from a young age. There is a need and a strong case for primary/secondary educators, universities and businesses to work together in entrepreneurial learning.
* Entrepreneurial learning is an investment for the future that educational institutions cannot ignore. It is a lifelong learning process, a vital area of learning that supports young minds to be creative and innovative. There is a need to develop programs and actions, together with industry involvement to develop structured pedagogy. Specific competencies and skills that address entrepreneurial culture, ideologies and attributes among primary and secondary school students are necessary.

These issues can be addressed by the following strategic actions:

* Develop support and assistance for entrepreneurial learning in the school curriculum, as indicated in Department’s Enterprise Learning webpage: (http://www.enterpriselearning.nsw.edu.au/)
* Develop targeted programs for niche student populations to inspire, promote and cultivate entrepreneurial education and connect students in regions, nationally and globally.
* Develop curriculum and pedagogy suitable for whole school and community approaches to entrepreneurial learning.
* Support an entrepreneurial paradigm that underpins the existing curriculum and education stakeholders.
* Support networks and collaborative action that develops awareness and empathy for entrepreneurial learning and culture.
* Develop educational initiatives to foster, support and cultivate entrepreneurial characteristics, behaviour and intention.
* Collaborate with industry groups and external partners to develop action-oriented pilot programs that can be developed in partnership with selected schools and regions to nurture entrepreneurial learning process and entrepreneurial culture in schools.

## 1.0 Introduction

In knowledge-based economies, the importance for individuals and society to ensure all students have the required knowledge and skills to continue further education and enter the labour market, is recognised as key to creating employment opportunities for youth and improving a nation’s competitiveness. What is needed are the skills, nimbleness and an entrepreneurial mindset to find or generate new employment options in the changing global economic climate in the 21st Century.

A recent report of the Organisation for Economic Co-operation and Development (OECD) Education Policy Outlook (2015) emphasises the need for innovation, knowledge and skills to promote growth and development and address inequalities and growing youth unemployment and the heightened need for improved provision. These include ensuring relevance of the curriculum, strengthening transitions between pathways, and improving links to the labour market to improve student outcomes.

Entrepreneurial learning is widely acknowledged as central to preparing young generations for future challenges. Due to the changing global economic climate and growing youth unemployment, the scale and urgency of developing personal skills and qualities has increased. The 21st century learning now requires new thinking, innovative learning, and creative ways of collaborating as well as new agility ,creative and transformative learning. Such knowledge and skills can be cultivated through problem-based solution-seeking learning that can best be developed through inculcating an entrepreneurial mindset.

The objective of entrepreneurial learning programs is to immerse participants in research knowledge about creativity, innovation, leadership and learning that is deep and context-based, with a strong focus on inquiry. Such programs should bring together students, teachers, industry representatives and academics to share experience and knowledge that encourages the building of an entrepreneurial culture, skills and mindset among all students.

How young people work today is remarkably different from the traditional and secure lifelong employment of the not too distant past. Most young people in the modern workforce experience multiple careers requiring different skill sets, knowledge competencies and broad professional skills and capabilities that enable them to engage in the workforce (Young, 2014). Young people must be provided with opportunities and knowledge to develop entrepreneurial skills that enable them to meet future industry challenges–whether they intend to start their own enterprise or work for someone else.

Providing the right mix of knowledge and skills that enable young people to be employed or find their own employment has become a major concern for educators, government officials and industry leaders. Besides academic achievements, all learners need to possess relevant knowledge, skills and capabilities in entrepreneurial skills that are recognised as vital for future employment. Fostering, cultivating and promoting entrepreneurial learning among young people allows them to gain an advantage in today’s economic and social climate.

The OECD (2015) reinforces the need for effective education policy reforms due to the growing importance of international trade, more diverse communities and digital societies. Compared with their parents, young people are immersed in a digital and information technology environment from a very young age and have greater opportunity to develop entrepreneurial savvy and apply ideas. (Little, 2012).

In an Australian context, the *Melbourne Declaration on Educational Goals for Young Australians* (MCEETYA, 2008) states that Australian governments commit to working in collaboration with all school sectors to support all young Australians to become successful learners, confident and creative individuals and active and informed citizens. It further states that to become confident and creative individuals, all students need to be enterprising, show initiative and use their creative ability. In addition, the declaration states that to be successful learners, they need to be creative, innovative, and resourceful and are able to solve problems in ways that draw upon a range of learning areas and disciplines.

The Global Entrepreneurship Monitor (GEM) Report in 2011 ranks Australians to be highly entrepreneurial and second only to the USA amongst developed economies. It was estimated that 10.5 percent of the Australian adult population has engaged actively in starting and running a business (GEM, 2011). Australia’s total early-stage entrepreneurial activity rate (TEA) combines those:

* in the process of starting business,
* operating new to business (up to three and a half years old)
* above average for nascent entrepreneurship (10.5 percent in Australia in 2011 compared with an overall average of 6.9 percent in all surveyed countries and second only to the US rate at 12.3).

However, the Australian TEA rate is low (6.0 percent) among young adults aged between 18 and 24 (GEM 2011) Entrepreneurial learning also provides an opportunity to draw on a rich base of varied fields such as science, mathematics, information technology and engineering and combined interdisciplinary knowledge. Several educational policy studies including the recent OECD study (OECD 2015) highlights that developing an entrepreneurial culture and cultivating enterprising skills among young students is vital for socio-economic development.

The purpose of this paper is to review some of the important trends in entrepreneurial learning and how entrepreneurial learning can be utilised to instil lifelong skills and capabilities among all young learners in schools. This paper reviews recent literature on entrepreneurial learning to outline how the Australian education system may foster, cultivate and promote entrepreneurial skills among young people.

## Focus of the Review on Entrepreneurial Education

This document reviews selected recent literature published in academic journals, government reports and OECD publications during the last decade to identify some of the key elements of entrepreneurial learning and the learning processes. The review team agreed to focus on the following research questions for the purpose of this review:

* What is entrepreneurial learning and doing?
* Why is entrepreneurial learning necessary?
* Can creativity and entrepreneurial learning be cultivated or taught? If so, how?
* What types of knowledge, skills and attitudes are necessary for building an entrepreneurial learning culture?
* How can creativity and entrepreneurial learning be assessed?
* Who should be the target group for entrepreneurial thinking and doing?
* What models of entrepreneurialism (programs and interventions) are available that could inform the development of specific school-based programs or interventions?
* What are the best practice models of creative and entrepreneurial learning?
* What are the potential equity issues and how can they be addressed?

The review team also examined the key strategies that would be useful in systematic development of entrepreneurial education in primary and secondary schools.

## 2.0 Defining entrepreneurial learning and doing

Any definition of entrepreneurial learning requires an understanding of the questions such as: what is entrepreneurship, who is an entrepreneur and what is entrepreneurial learning all about?

Entrepreneurship is not one-dimensional and the entrepreneur comes in shades of many different colours, such that it is presumptuous to conceive of a simple, agreed approach. The traditional business view of entrepreneurship is associated with filling a market gap. This definition of entrepreneurship relates to creating a business enterprise to pursue profit and has now extended to include learning, behavioural and attitudinal changes to individuals and organisations. Economic, and more broadly community benefits, are realised through the advancement of entrepreneurial skills.

Entrepreneurship is associated with personnel traits and with the decision-making capability of individuals. Baumol (1993) maintains entrepreneurs are those who use imagination, boldness, ingenuity, leadership, persistence and determination as key entrepreneurial behaviours. Entrepreneur is defined as: “… someone who specialises in taking judgemental decisions about the coordination of scarce resources” (Casson, 2003, p225).

The term ‘entrepreneurship’ is extended beyond the entrepreneur to include the process of entrepreneurial action. This suggests that entrepreneurship is not necessarily something one is born with, but a set of skills and knowledge that can be achieved by learning and doing. Shane and Venkataraman (2000) suggest that entrepreneurial action is a nexus of opportunities and agency. This opportunity and agency view has focused on the existence, discovery and exploitation of opportunities, which suggests that opportunities are objective, individuals are unique and entrepreneurs are risk takers.

Metcalfe (2004: 157) emphasises the importance of a clear concept of what entrepreneurship, entrepreneurial activity and enterprise learning mean. He argues that at the outset, we must recognize that acceptable definitions of entrepreneurial activity and its image, the entrepreneur, the agent of entrepreneurial behaviour, are not readily achieved. Furthermore, Hindle (2009) argues that entrepreneurship can be conceptually defined as a three-phase process (evaluation, commitment, management) that transforms the potential value of new knowledge into realised economic value for defined stakeholders.

Entrepreneurial action is not a discrete activity but a series of connected activities that are often necessary to be sourced from more than one individual, resulting in a connected process of value creation involving people with different competencies (Iancu, 2011).

Entrepreneurial learning can extend beyond business oriented entrepreneurship in the sense that entrepreneurial learning encompasses creating a mindset and cultivating an entrepreneurial culture that impacts all walks of life. Entrepreneurial learning,therefore, can be expanded to provide experience and providing confidence to enable all students to learn to be creative and entrepreneurial. This would add an extra skill set and knowledge for students to become successful learners, confident and creative individuals who are knowledgeable and skilled to face future work and life challenges, whether or not an individual will become a successful entrepreneur.

Colin and English (2004) suggest that entrepreneurial learning is the process of providing individuals with the ability to recognise commercial opportunities and the insight, self-esteem, knowledge and skills to act on them. Besides commercial gains, entrepreneurial knowledge and skills include the ability to think creatively, work in teams, manage risk and handle uncertainty. Often opportunities are discovered. Therefore, there is no one best way to teach, learn and acquire entrepreneurial knowledge, skills and an entrepreneurial mindset.

The World Economic Forum emphasises the power that education has in developing an entrepreneurial mindset and in preparing future leaders for solving complex, interlinked and fast-changing problems. It defines entrepreneurship as, “The pursuit of opportunities beyond the resources you currently control” (*World Economic Forum*, 2009, p9). Entrepreneurial education can be a societal change agent and a great enabler in all sectors. Not everyone need end up as a successful business or social entrepreneur, but each individual can benefit from entrepreneurial learning.

Even earlier, the European Union (EU) *Employment Guidelines* identified entrepreneurship as a priority in the education system and the Commission for European Communities (2003) is this the correct title??maintained that entrepreneurship is encouraged by fostering the right mindset, skills and awareness of career opportunities.

Furthermore, the European Commission defines entrepreneurship as:

“…a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in a social, cultural or economic context” (European Commission, 2006, p 20).

The OECD (2009) suggests that entrepreneurship is about the development of one or more of a combination of attitudes, personal qualities, and formal knowledge and skills. This definition extends to include both society and environment.

This reflected the OECD’s *Eurostat Entrepreneurship Indicators Programme* (EIP), which was launched in 2007, defined entrepreneurship as,

“Human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets. In this sense, entrepreneurship is a phenomenon that manifests itself throughout the economy and in many different forms with many different outcomes and these outcomes are not always related to the creation of financial wealth; for example, they may be related to increasing employment, tackling inequalities, or indeed, increasingly, environmental issues.” (OECD, 2011a:3)

Pepin (2012) examines what is meant by learning to be enterprising in schools, particularly during the basic schooling of students at both the primary and secondary levels. He argues that entrepreneurial education or education through enterprise refers to the idea of developing general skills in students that may be useful in numerous life situations, for the purpose of educating students who are enterprising The paper questioned the wisdom of exactly what primary and secondary students are introduced to in order to achieve a broader vision of entrepreneurial education. According to Pepin, entrepreneurship education has three distinct strands: content-laden (knowledge about entrepreneurship)occupationally oriented (small business skills and entrepreneurship as an occupational activity) and process-driven, where entrepreneurship is viewed in terms of a process. The first two strands are associated with narrow economic vision whereas the third relates more to broader missions of primary and secondary schooling.

While the concept of entrepreneurship has been applied to a range of possible contexts, the word ‘enterprise’ is still most often used in association with setting up a business. However, the UK *Enterprise for All* report (Young, 2014) outlines that enterprise means more than just the ability to become an entrepreneur. It is this quality that gives an individual a positive experience and is valuable in making learning relevant to the real world and throughout life. In addition to the ability to become an entrepreneur, the report argued that besides entering into self-employment or starting their own company, enterprise learning prepares confident learners, and independent and deep thinkers. Entrepreneurial learning allows students at all levels to establish a purpose and put a plan of action to the test of experience at all phases of the entrepreneurial process. Learning in entrepreneurship can bring about learning and reflection, allowing deep engagement in content and pedagogy.

The European Commission (2014) in a recent call for a proposal for young entrepreneurship states that:

“Entrepreneurship education seeks to prepare people to be responsible, enterprising individuals who have the skills, knowledge and attitudes necessary to achieve the goals they set for themselves and to live a fulfilled life. In addition to equipping people with the skills to start a business, entrepreneurship education is also about encouraging creative thinking and promoting a strong sense of self-worth, initiative and a tolerance of failure” (European Union, 2014).

Entrepreneurship education is broadly taken as:

“All forms of learning, education and training which contribute to entrepreneurial spirit, competence and behaviour; with or without a commercial objective” (European Commission, 2014 p.4)

Further, the report adopts the following definition of entrepreneurship as a key competence:

“Sense of initiative and entrepreneurshiprefers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports individuals, not only in their everyday lives at home and in society, but also in the workplace in being aware of the context of their work and being able to seize opportunities, and is a foundation for more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance.”

OECD has recently focused on inclusive entrepreneurship, which contributes to social inclusion to give all people an equal opportunity to start up and operate businesses (OECD, 2015).

The definitions of entrepreneurship capture the entrepreneurial action and process as well as entrepreneurial characteristics and behaviours. In the school setting, cultivating entrepreneurial capabilities for all students by establishing an entrepreneurial mindset and supportive culture, seems to be favoured in all definitions and concepts of entrepreneurship. Whilst not all individuals will choose to become entrepreneurs, learning to think creatively and innovatively will benefit all students.

## Defining Social Entrepreneurship

Social entrepreneurship has gained considerable attention in the recent past and it differs from other forms of entrepreneurship that are aiming at business and economic development. The popular definition of social entrepreneurship refers to the ability to leverage resources that address social needs, objectives, problems and social issues rather than purely profits objectives. An extensive treatment of social entrepreneurship definitions is available in Dacin et al (2010). This article examines the current state of the social entrepreneurship literature and explains what is unique about social entrepreneurship and recognises that there is much overlap between the domains of conventional, institutional, cultural and social entrepreneurship. Zhao highlights social entrepreneurship as being a subset of entrepreneurialism, which aims to create social value and benefit by exploiting opportunities to better the environment and society: social entrepreneurialism (Zhao, 2012).

Social entrepreneurship is concerned with producing an innovative solution to a social problem or need. An often cited example is the 2006 Nobel Peace Prize award to Mohammed Yunus for his Grameen Bank (NobelPrize.org, 2006) initiative, which developed an innovative solution to provide financial capital for the underprivileged to make a difference to living conditions and employment opportunities.

Berman and Mellon (2012) address the challenges faced by young social entrepreneurs when influencing social action in local, national and international contexts. The Foundation for Young Australians (FYA) Young Social Pioneers program for young people aged 18-29 across Australia, specifically aims to address empowerment and citizenship among young people, and to advocate emerging social activism amongst the young to effect social change in their community and beyond. Findings suggest that collectivism, collaboration and self-development impact upon civic and social participation of young entrepreneurial people and confirm that the program led to pioneers developing their social purpose, networks and skills (FYA, 2013).

## 3.0 The need for entrepreneurial learning

The current global economic climate causes increased uncertainty for enterprises and individuals, making entrepreneurial learning all the more urgent. The *Europe 2020* strategy recognises that if Europe is to meet the economic and social challenges it faces, there is a critical requirement for its citizens to become more entrepreneurial across all walks of life - for example, in economic and social innovation, new business creation, employability and active citizenship (European Commission, 2014). The report argues that in order to build 21st century skills, efforts should be concentrated on developing entrepreneurial skills such as critical thinking, initiative, problem-solving and working collaboratively.

Research conducted by Ernst and Young (2014) shows that while many countries make significant education investments, there are limited educational options to foster entrepreneurial learning which is considered to be the key to driving future employment prospects and economic development.

Henry, Hill and Leitch (2005) attribute four factors: global, societal, organisational and individual which are conducive to, or necessitate the development of entrepreneurial abilities in the workforce. The global factors include the reduction in trade barriers and advances in technology and communication leading to a more interconnected world. At the societal level, trends towards privatisation, deregulation, new forms of governance, environmental concerns and increased attention being given to human rights factors are regarded as central. At the organisational level, trends towards decentralisation, downsizing, outsourcing, flexibility and the casualisation of the workforce are regarded as critical. At the individual level, relating to changing employment options, variable family structures and responsibilities are recognised as important for the need to develop entrepreneurial capacities.

Given the rapid advances in internet technology and information flow, the better use of science and technological knowledge relies on entrepreneurial capability to transform ideas into functional, sustainable and profitable business activities. New century students need to be conversant with advanced skills and modern enterprise needs. Sternberg and Wennekers, (2005) argues that new venture creation and establishing entrepreneurial firms have significant impacts on industrialised economies. It is not surprising that policies to generate ‘clever’ and entrepreneurial societies are high on the agenda of many national governments and regional and international agencies (Liyanage, 2008).

Entrepreneurship also relates to unemployment and future industrial relations. A report from the UK entitled *Enterprise for All* (Young, 2014) describes the typical trajectory in today’s employment market as consisting of multiple careers requiring different skill sets, knowledge competencies and broad professional skills and capabilities. The report suggests that the education system and career advice need to adapt to this changing pattern of work, including a better balance between education and skills for employment and the motivation and support to become self-employed.

Unemployment among recent graduates remains high. The recent *Australian Graduate Survey* (2014) and *Graduate Destination Survey* from the Australian Bureau of Statistics (2013) Labour Force data shows that the number of unemployed youth (aged 15-24 years) is growing. According to ABS, the number of males aged 15 to 19 looking for full-time work was 23.9 percent in March 2013, up from 21.8 percent a year earlier; the figure was 29.8 per cent for females.

Entrepreneurial learning is considered important for lifelong learning. The concept of a career is no longer tied to the structural progression in an organisation, rather it is mapped to an individual’s life trajectory and life stage needs.

Working lives are being extended and often, in existing organisations, career opportunities, cultures and practices may not fit an individual’s aspirations, identities and work modes. As a result, a person may often seek to become entrepreneurial for self-fulfilling reasons. Such people may exhibit evidence of “reluctant entrepreneurship” which is the outcome of casualisation and outsourcing of employment. For unemployed youth, entrepreneurship could be a significant source of future employment prospects as well as unleashing creative and enterprising potential..

*What can governments do?*

Recent Australian government reports into the workforce and Australia’s innovation capability, have recognised the importance of building entrepreneurial capability for Australia’s growth. Several reports have dealt with innovative and creative workforces in different ways and have made references to innovation, entrepreneurship and the creativity of the nation. These reports include:

* *Backing Australia’s Ability*, Commonwealth Government, 2001
* *Employability Skills for the Future*, Commonwealth Australia, 2002
* Bradley *Review on Higher Education*, Commonwealth Australia, 2008
* Cutler *Review of the National Innovation System*, 2008
* O’Kane Review, *Collaborating to a Purpose: Review of the Cooperative Research Centres Program, Commonwealth Australia, 2008*
* *VET Products for the 21st century, National Quality Council, 2009*
* *Foundations for the Future*, Skills Australia, 2009
* *Overcoming Indigenous Disadvantage: Key Indicators 2007*. Productivity Commission, 2009
* *Shaping Our Future: Australia’s National Strategy for Vocational Education and Training 2004 – 2010. ANTA, 2003*
* *The Vocational Education and Training System, Key Issues for Large Enterprise, Business Council*, 2004.
* *Building Australia’s Future Workforce: trained up and ready to work*, Australian Government, 2011
* *Building Australia’s Innovation System*, Business Council of Australia, 2014
* Miles Review, *Growth through Innovation and Collaboration, A review of the Cooperative Research Centres*, 2015.

These reports and others emphasise the need to become a creative and innovative nation to secure Australia’s position in the creative industries. Nevertheless, none of these reports adequately deals with youth entrepreneurship or how to cultivate entrepreneurial culture in schools. Most reports for example have recognised the need to cultivate entrepreneurship in general and for example, the *Bradley Review* (2008) recognises the need for a creative and entrepreneurial workforce:

“As the world becomes more interconnected and global markets for skills and innovation develop even further, it will be crucial for Australia to have enough highly skilled people able to adapt to the uncertainties of a rapidly changing future”. (*Bradley Review*, 2008, p.xi)

Entrepreneurial education links with scientific and technological skills and knowledge. The importance of science, technology, engineering and mathematics (STEM) education is often emphasised. Concerns have been expressed on the general decline in some STEM subjects in Australia and the world over.

A report of the Australia’s Chief Scientist released in September 2014 maintains that:

“State and territory governments all design and fund a patchwork of programs relevant to STEM – from schools through to vocational and tertiary institutions and in business and industry. They may, or may not, align with the effort of federal investment in education, innovation or research and development”. (Chief Scientist, 2014, p10)

The report further argues that Australia needs to strengthen its education system for more students to become creative, innovative and literate in scientific and technological areas that support entrepreneurship.

Several leading industries such as Intel Corporation, CISCO and Gallup are engaged in providing workshops, courses and training programs for teachers and students to improve general capabilities in the areas of innovation and entrepreneurship. Gallup has analysed the PISA and GEM performance to assess entrepreneurial capabilities and found negative correlation between PIAS maths scores and GEM–perceived entrepreneurial capability scores (Busteed, 2014). Furthermore, Gallup Strengths Centre claims that the one thing the world's 7 billion people want more than anything else is a good job. It explains that small to medium-sized businesses are the largest producers of new jobs in any community and the success of those companies relies on the entrepreneurs who start and grow those organisations.

**4.0** The art of cultivating creativity and entrepreneurial learning

The discussion about whether entrepreneurs are born or made is an age old debate. Shefsky (1994), having interviewed 200 entrepreneurs, concludes entrepreneurship comes from ordinary people who have acquired certain traits where entrepreneurship is an acquired rather than an inherited trait. Although not everyone will be successful or suited to be an entrepreneur, Shefsky argues that all individuals have the potential to become one given the right conditions. A similar argument was also put forward by Filion (1994) who argues that entrepreneurs could be trained just as managers are trained to work in companies. Henry, Hill and Leitch (2005) question whether entrepreneurs are born or made. Some have taken an opposing view point to suggest that entrepreneurs are usually born not made (Fisher and Koch 2008).

Some have questioned whether entrepreneurship can be taught (Gray and Field, 2006). The House of Representatives Standing Committee on Science and Innovation (2006 ) of the Parliament of Australia recognises the lack of entrepreneurial and innovation skills and recommends developing a series of measures targeting the early development of entrepreneurial skills in the education system (including the early school years) and the broader community. The Australian Government’s initiative of Enterprise Learning for the 21st Century, undertook an enterprise learning in the Middle Years project (2005-2007). A total of 59 NSW government schools participated in this project, with students in Years 5–9 participating in enterprising projects primarily within the K–6 Science and Technology, and Years 7–10 Technology (Mandatory) learning areas. Wilson (2008) argues that education plays an essential role in shaping attitudes, knowledge, skills and culture among students from a young age.

How entrepreneurs obtain creative ideas or what the process is for the new idea generation, are important questions in entrepreneurial learning. Gemmell, Boland & Kolb (2011) studied the socio-cognitive dynamics of entrepreneurial ideation through interviews with 32 successful technology entrepreneurs to understand how they use social behaviours, techniques and cognitive processes in generating, validating and refining their ideas. Their work found creativity to be a critical component of entrepreneurial ideation and that such creativity can be taught and cultivated with targeted education. Such ideation involves the stretching and expansion of ideas, most commonly by combinations of dissimilar objects, analogical associations and methods of problem-framing/finding, where particular solutions emerge based on the manner in which a problem is identified and framed.

The cultivation of entrepreneurial skills is discussed with reference to building high confidence in one’s own skills, required knowledge to start a business, and maintaining independence. Amabile (1997) suggests that intrinsic motivation, where an individual is motivated by the properties or nature of the task rather than external factors, is a common state/trait of highly creative entrepreneurs. Perseverance is another key characteristic necessitated by the recursive nature of entrepreneurial work. In contrast to traditional models that depict entrepreneurial ideation as a linear process, the authors presented findings that suggest an ongoing, cyclical and recursive social process of problem-solving and learning. Entrepreneurial work is characterised by active experimentation and rapid iteration of ideas rather than protracted conceptual analysis. It is argued that entrepreneurial ideation must be considered a social activity that takes place through a cycle of learning and experimentation. The entrepreneur is characterised as a team leader or partner in a complex multilevel social environment, rather than a sole actor. The ability to work with a “trusted partner” is the most crucial ideational resource. This symbiotic relationship is maintained through focused sessions of shared cognition in which partners interactively exchange and translate symbols between media (distributed ideational cognition).

Education plays an essential role in shaping attitudes, skills and culture throughout schooling, and in particular as early as the primary years. The entrepreneurial learning process involves acquiring distinct knowledge and skills in creating new ideas, evaluating and selecting a best idea, developing and trialling that idea, developing a prototype, piloting and commercialising and marketing a product or a service. The entrepreneur’s solution or hypothesis reflects their perspective strategy; vision, appropriation and entrepreneurial form of sense-making to interpret events against the backdrop of what is known and assumed about the environment (Mintzberg, Ahlstrand & Lampel, 2005).

One of the most effective means of creating talented entrepreneurs is argued to be early exposure to entrepreneurial culture. Beside formal education, entrepreneurship is also cultivated through building confidence and exposure to entrepreneurial work. Ohe and Ohe (1996) conducted a survey of 310 entrepreneurs and 334 corporate employees and concluded that entrepreneurial work is accumulated in three stages: upbringing, childhood experience and work experience.

Teaching entrepreneurship requires a synthesis of combining essential knowledge and skills together with building confidence and independent thinking processes. This can be achieved by a systematic approach of exposure to a variety of concepts, interaction with successful entrepreneurs and building a culture of entrepreneurship. Ishiguro (2014), having surveyed Japanese school students, concludes that entrepreneurial programs in schools should encourage the students’ communication skills, leadership ability and independence, together with providing students with opportunities to be active, recognised members of society. Such recognition can be achieved through programs such as Ernst & Young *Entrepreneur of the Year* program which runs in over 60 countries and is considered an important initiative.

**5.0** Building an entrepreneurial learning culture

Entrepreneurs require knowledge of starting and growing a business and having the technical knowledge required to generate new ideas for useful products, processes and services. Entrepreneurs are also able to conduct systematic research, engage in marketing activities, business administration, risk taking and financial management (Chen et al., 1998).

The entrepreneurial culture in a country affects the attitude that individuals have towards entrepreneurship, the likelihood of choosing entrepreneurship as a career, the ambitions to succeed and to start again after a failure and the support provided to those planning to set up a business (OECD 2011:104).

Several studies identified types of entrepreneurial skills and attitudes that entrepreneurs need to possess. Among those were the need for achievement, locus of control, risk taking propensity and tolerance of ambiguity (Brockhous and Horwitz, 1986). One of the important attitudes discussed is self-efficacy and its effects on an individual’s belief in their ability to influence events that affect their lives (Bandura, 1997 and Shane et al 2003).

Having a supportive culture is fundamental for entrepreneurs. An appreciation of the importance of the development of entrepreneurial culture is reflected in the Finnish *Development Plan for Education and Research 2003–2008*. The plan integrates entrepreneurship education into the education system, assuming that a mindset favourable for entrepreneurship creates a basis for it. This assumes that teaching entrepreneurship will encourage the mindset that creates entrepreneurs. Liddle, (2012 p xvi) in reflecting on his own entrepreneurial experience, suggests “Being an entrepreneur is a mindset that some kids are lucky enough to be taught by their parents, others pick it up through books, and still others happen upon a mentor that instils these values in them”.

Building entrepreneurship culture requires strategic action. A recent report of Intel, CSCO and Microsoft entitled “Building a culture of entrepreneurship–starting with education” (Microsoft, 2015) identified the importance of promoting entrepreneurship and its integration into education. This requires building awareness, embedding it into education, putting entrepreneurs in the classroom, and teaching using project based learning.

European efforts to promote entrepreneurship education are relatively recent. Several OECD reports (OECD, 2008) cite the slow growth of the venture capital market in Europe as a reason for this delay. The major characteristic of European entrepreneurship education is the focus on small and medium enterprise, whereas US entrepreneurship generally refers to growth-oriented ventures or companies. In addition, efforts to develop entrepreneurship as academic field in European universities have been slow. While many universities in the US have well developed educational programs, European and other countries are only beginning to develop such programs. In recent years, the European Community has paid increased attention to bolster entrepreneurial education. *The European Foundation for Entrepreneurship Research* fosters and promotes research and teaching in all fields but such efforts are rarely practised in European countries. A detailed account of entrepreneurship education can be found in the *Entrepreneurship 2020 Action Plan* (European Commission, 2012) and the European Commission’s (2013) *Entrepreneurship Education: a Guide for Educators*.

The OECD (2008) report concludes that greater clarity is needed for the purpose and goals of entrepreneurship education and these should be based on a broadly defined set of outcomes. Entrepreneurship education is also about developing attitudes, behaviours and capacities at the individual level. The report also recognises the importance of creating entrepreneurial culture and creating a critical mass of entrepreneurship teachers.

Education programs can be targeted at young people in secondary schools and also at the primary school level. Besides efforts at individual school and teacher level, there is limited evidence of systematic professional development in entrepreneurial learning in Australian schools.

The idea of education for entrepreneurship could be embedded within the broader school curriculum. For example, New Zealand adopts a “whole school” approach to entrepreneurship as a curriculum goal (Hodgetts, 2009). In other words, education for entrepreneurship provides “an underlying basis for delivering education across all areas of the curriculum”.

## 6.0 Assessing entrepreneurial learning

A recent report of the European Commission (2014) suggests that the main indicator for entrepreneurship education and competencies should ideally be one based on a direct assessment of learning outcomes. Most entrepreneurial assessment is not based on direct assessment. Some areas such as financial literacy and collaborative problem-solving are assessed and included in *Program for International Student Assessment* (PISA 2015). The report explains that currently available indicators are based on self-reporting rather than direct assessment of learning outcomes. The report finds that a robust assessment of learning outcomes and linking these with entrepreneurial learning activity and entrepreneurial actions, requires careful design of monitoring systems – including over time and allowing for self-efficacy.

A number of European research projects have been undertaken in Finland and the Netherlands. In 2005, the Centre for Research on Lifelong Learning (CRELL) was created by the European Commission. In 2006, the Commission proposed key competencies for lifelong learning. The indicators proposed were in literacy, mathematics and science, language skills, civic skills and learning to learn skills. The European framework and test was developed and revised by CRELL. The framework model is based on three dimensions of learning to learn: cognitive, affective and metacognition. These scales are cross curricular, testing competence rather than knowledge.

Cognitive dimension is based on four sub-dimensions:

* identifying a proposition
* using rules
* testing rules and propositions
* using mental tools.

Affective dimension is comprised of three sub-dimensions:

* learning motivation, learning strategies and orientation towards change
* academic self-concept and self-esteem
* learning environment.

Meta-cognition comprises three sub-dimensions:

* problem-solving and monitoring tasks
* metacognitive accuracy
* metacognitive confidence.

Zhang, Zhao and Lei (2012) argue that high-stakes standardised testing stifles creativity and is recognised as more of a problem in China than in western countries since test scores do not provide an accurate picture of ‘ability oriented’ education, but of ‘test oriented’ education. Zhao (2012) presents three issues:

* China faces an economic shift from the need for ‘cheap, abundant labour’ to the need for innovation and knowledge and that the Chinese have ‘engaged in a series of fundamental reforms since the 1980s’. How will education in China provide for these needs?
* PISA test scores show that students from China (Shanghai) score highly compared to the US (and to a lesser extent, Australia). As a result, there is an argument that western countries should emulate Chinese educational practices. Should western systems be doing this?
* China is a potentially vast market for education. How big is the market and how will China react?

A new paradigm for entrepreneurial learning is discussed in Zhao (2012) which includes school autonomy and leadership, making things for real audiences and product orientated learning or learning by making. Zhao argues that entrepreneurship and creativity do not necessarily come from government planning, standardised curriculum, or standardised testing and often they tend to work against both entrepreneurship and creativity. According to Zhao, entrepreneurship and creativity are more than a set of prescribed knowledge and skills and often include spiritual, psychological, social and cultural knowledge. Zhao (2011) argues such knowledge and skills must be deliberately cultivated and should start at a young age rather than providing a crash course later in learning.

In terms of assessment of entrepreneurial skills and knowledge, venture capitalists usually rely on their own experience in judging a good idea and identifying a novel opportunity. The *Ernst & Young Entrepreneur of the Year* program (Ernst & Young, 2004) uses explicit criteria for judgement: entrepreneurial spirit, financial performance, innovation, national and global impact, personal integrity and influence, and strategic direction.

The report of the European Commission (2008), *Learning to Learn: What is it and can it be measured?* identifies the phenomenon of learning to learn and highlights the challenges associated with defining and measuring this concept in the context of a European test on learning to learn. The content of this report examines the basic skills for success in the knowledge society, which are the ability to learn and also assess learning.

The assessment of entrepreneurial learning has to be flexible, ongoing and student-centred, whilst being able to address external standards and reference points. This can offer a new direction for enterprise education based around a pedagogical framework, using a waypoint-based, narrative form of assessmentcentred on a learner-designed journey.

Competencies are defined as “the internal mental structures in the sense of abilities, dispositions or resources embedded in the individual.” This directs our attention beneath the observable behavioural surface of skills to inquire into the cognitive capacity that influences the behaviour.

Entrepreneurial education is assessed using various tools, and comprehensive analysis is found in Thomas H and Kelly D (edited) *Entrepreneurship in Asia*? (2011). Ishiguro (2014) investigates the effect of an entrepreneurship education program for 172 Japanese high school students, which was conducted between 2013 -2014 in Aomori Prefecture located in north-west region of Japan. The study found that the high school students had respect for entrepreneurs even before the entrepreneurship education had been launched and concluded that the key to the entrepreneurial mindset is positive awareness and that the program should be connected to real society, and supply the students with opportunities to be active as members of the society.

Finland has developed a nation-wide venture known as *Innolukio* for upper secondary schools, which aims at a learning environment that encourages upper secondary school students towards creative thinking and provides them with the knowledge and skills that are required in future work tasks. This program provides inspirational videos, weekly exercises, the *Innolukio* competition and learning materials that support creativity (OECD, 2013).

The assessment of entrepreneurial education needs to be understood in terms of the issue of time scale where younger people would have many other influences over the intervening years and be able to apply their learning and competencies in later years. The Business Council of Australia (2009 ) emphasises the importance of ensuring education and training systems that provide students with industry-relevant technical skills and experience as well as capabilities associated with communication, team work, problem-solving, entrepreneurship and leadership.

Similarly, the Australian Government responded positively to support initiatives for fostering entrepreneurial thinking among young people as outlined in the 2020 Summit, which reiterated the fundamental change in education to support innovation and entrepreneurship from the earliest years of schooling (Australian Government, 2009). A similar argument is made in the Digital Education Advisor Group Report (2013) entitled *Beyond the Classroom: A new digital education for young Australian in the 21st Century*.

The report of the Prime Minister’s Science, Engineering and Innovation Council (2002) notes that entrepreneurship is a difficult concept to define and measure. It is more than starting up a new business; it encompasses risks, new and innovative ideas and addressing problems through radical thinking.

The assessment of entrepreneurial learning, needs to be understood in a broader context of assessing experience, skills and knowledge that encompasses individuals and groups’ achievements that may be difficult to quantify. Qualitative issues such as mindset, empathy, leadership, enthusiasm, creative ability, commitment and interests, should also be included throughout formal and non-formal entrepreneurial learning processes.

## 7.0 Best practice in entrepreneurial learning

Entrepreneurial learning has been advocated at international levels by several key players. The Kauffman Foundation, the OECD, the European Commission and the Global Entrepreneurship Monitor (GEM) are among key contributors to efforts aimed at improving our understanding of the dynamics and complexities of entrepreneurial activity as well as its impacts on innovation and wealth creation.

The creation of the *Foundation for Entrepreneurship* was inspired by theKauffman Foundation in the USA and has been working to promote education and training in entrepreneurship since the 1980s and has supported many new teaching initiatives, including the Kauffman Campuses project. The Kauffman Foundation provides integrated programs on entrepreneurship across-campus in order to instil entrepreneurial thinking in disciplines.

As part of the GEM initiative (Zacharakis, et al, 1999) each participant was asked if he or she was currently involved in a new firm start-up and could meet three criteria: (1) some activity to create the start-up in the past 12 months (e.g., business plan, team formation, incorporation, etc.); (2) expected to own all or part of the new business and (3) the start-up firm had yet to pay salaries for more than three months. Both qualitative and quantitative assessment can be utilised in assessing entrepreneurial learning outcomes of school students.

Entrepreneurial thinking requires the ability to recognise and capitalise on opportunities. Krueger et al (2000) argues that since opportunity identification is an intentional process, intention based models offer a practical guide to developing entrepreneurial learning programs. Minniti and Bygrave (2001) proposed a structural model of entrepreneurial learning, which focused on identifying desirable opportunities and dealing with the uncertainty associated with the payoff of these opportunities. Several models of entrepreneurial learning are available.

One such model is described in the Netherland’s Ministry of Economic Affairs (2002) and has the following components:

* learning programs based on the “learning by doing”method, whereby learners create and run mini-enterprises or participate in practice or training firms
* providing specific training for teachers/trainers on entrepreneurship to develop enthusiasm and engagement in real world experiences.
* building effective links and networks between educators, training providers, industry and government. It is important to build regional and national networks that encourage and provide opportunity for entrepreneurs to learn among themselves.

According to Jamieson (1984), models categorising entrepreneurship education and training, can be considered as:

* education about enterprise: awareness creation
* education for enterprise: encouraging the set-up and running of small business
* education in enterprise: management training for business growth and future development.

The OECD report (2009) also identifies five ways to evaluate entrepreneurial education programs:

* the experimental approach (based on control groups);
* non-experimental methodology (involving a before and after comparison of the same individuals);
* matching (pair individuals in the treatment group to a member of the control group with similar characteristics);
* propensity score matching (match along a single measure) and
* the difference-in-difference approach (which combines matching with before and after treatment comparison).

The factors that are used in the evaluation framework include: enterprise capability (knowledge and understanding of concepts, skills, attitudes and qualities), financial literacy and economic and business understanding. The report concluded that there is no single approach to the evaluation of education for entrepreneurship programs and therefore no single model which can be applied in all situations. A combination of qualitative and quantitative approaches may be used.

The OECD’s EIP conceptual framework (OECD, 2011) distinguishes between the determinants (regulatory framework, culture; knowledge creation and diffusion, access to finance, entrepreneurial capabilities, market conditions), performance (enterprise birth, death, survival and growth rates; ownership rates, average size of firm after 3 and 5 years, productivity, innovation, export of young firms) and impacts of entrepreneurship (job creation, economic growth, poverty reduction). Although these concepts are more applicable at entrepreneurial firms, developing a mindset of entrepreneurship requires some understanding of relevant models of development, as they provide confidence and empathy towards entrepreneurship.

Collins and Robertson (2003) report on the teaching approach of the week-long residential Entrepreneurship Summer School, held annually at Leeds Metropolitan University in UK. The program, which included a student centred model and an enabling approach to teaching and learning enterprise, brought students and tutors together from a variety of backgrounds and with different expertise. It also included a teaching approach of a virtual support network, regular electronic updates comprising useful contacts and follow-up sessions. Participants in the summer school were provided with support through a business start-up website as a reference point and received practical peer assessment from small business advisers. The delivery of the program was creative rather than academic with a focus on the issues specific to small business. The value of networking was reinforced through feedback, demonstrating the value of consultation and maintenance of business contacts. After the course, 75 percent of participants felt more confident about setting up a business and had a demonstrated awareness of the value of analytical skills. The key learning outcomes desired were achieved and participants left the course well prepared and inspired to set themselves up in business ventures.

The Award Scheme Development and Accreditation Network (ASDAN) supports educational programs and award schemes such as Corkscrew thinking that takes young social entrepreneurs through a series of 10 day and 28 day programmes using real-time business challenges and critical learning sessions. It also provides teacher training to design creative problem solving, proactive learning and confidence in leadership. These customised programs, developed by Corkscrew thinking and accredited by ASDAN, provide students with the confidence and ability to consider entrepreneurship as a viable career option or to use their new employability skills in any future employment (ASDAN, 2015).

The Danish government has structured entrepreneurial learning progressively throughout the education system. The vision is to give students an introduction to entrepreneurial thinking, develop students’ knowledge of entrepreneurship, and to develop the ability of students to act entrepreneurially (Danish Agency for Science, Technology and Innovation, 2009).

The Danish model has a number of key elements which include:

* development of entrepreneurship teaching,
* development of study programs, courses and teaching methods for students,
* development of tests and examinations,
* talent development,
* collecting and disseminating knowledge, international and cross-national initiatives,
* developing and co-financing entrepreneurial strategies in education system,
* dialogue with educational institutions,
* implementing activities to foster a culture of entrepreneurship,
* coordination and project management of national and international projects related to entrepreneurial learning.

Three important issues dealt with in these models include the facilitation of self-employment as a career option, promoting personal qualities such as creativity, risk taking and responsible development, and the acquisition of technical and business skills needed to create, maintain and further develop business enterprises.

### 8.0 Recent Australian and international experience in entrepreneurial learning

The Australian schooling system has been inconsistent in its response to developing entrepreneurial learning programs in schools. In the past, isolated efforts were made by individual schools, private institutions and innovative teachers, head teachers and principals to engage students in creative and innovative learning. The Australian Curriculum Assessment and Reporting Authority (ACARA) offers an integrated approach to entrepreneurial learning through the cross-curricular general capabilities (ACARA, 2013). For example in the technology curriculum, the focus on real world scenarios such as the emergence of the knowledge economy and national priorities such as the scarcity of water, and health and well-being, provide the context for the curriculum goals of creating preferred futures, project management  and developing reasoning skills in systems thinking, design thinking and computational thinking. More broadly the Australian Curriculum includes seven general capabilities:

1. Literacy
2. Numeracy
3. Information and communication technology capability
4. Critical and creative thinking
5. Personal and social capability
6. Ethical understanding
7. Intercultural understanding

These capabilities encompass a significant portion of the knowledge, skills, behaviours and dispositions required of entrepreneurial learning for students to successfully live and work.

King (2014) suggests that science and technology education requires systems thinking and inquiry based learning, which couples science and technology outcomes with entrepreneurial learning.

One of the important initiatives is the Work Studies Years 9-10 curriculum. Thisdelivers a school-based subject that provides opportunities for students to undertake vocational learning and develop work-readiness skills in preparation for further study towards a skilled occupation or further education after leaving school. The Board of Studies Teaching and Educational Standards NSW (BOSTES) developed the draft paper on Work Studies Years 9-10 of the Australian Curriculum and recommends that the paper should provide guidance to the development of students’ literacy and numeracy skills at all ability levels. It provides advice about:

* activities that promote self-management and self-direction,
* the characteristics and development of entrepreneurial and creative skills;
* the diversity of learners from language backgrounds other than English;
* the relevance of the curriculum to teachers and coordinators of programs for gifted and talented students and
* the inclusion of resources that support Aboriginal and Torres Strait Islander Peoples history and culture(BOSTES, 2012, ACARA, 2014).

In the Department of Education, entrepreneurial learning has been encouraged through a range of programs. A nationally agreed definition by MCEETYA (2008) states that enterprise learning is a component of 'vocational learning' which includes career education, general employability skills, enterprise learning and work and community based learning.

The NSW Department of Education collaborated on the *Building Bridges: Enterprise Learning in the Middle Years* project (2005-2007). This was a cross-directorate initiative funded by the Australian Government. Students in Years 5-9 from 59 NSW government schools participated in enterprising projects, mostly in Science and Technology learning areas. Part of this project saw the development of *Studio E* - a virtual studio to help students in Stages 3-4 explore an enterprising task and draft a design brief for their own project. While still in use, this DoE resource needs to be updated.

For some years, the BOSTES has included *Work Employment and Enterprise* and more recently *Work and Enterprise* cross curriculum content in K-10 syllabuses. BOSTES Work Studies for Years 7-10 includes enterprise learning and BOSTES Work Studies for Years 11-12 includes *Teamwork and Enterprise Skills.*

Enterprise learning has become part of curriculum provision in many public schools. Annual reporting by over 400 NSW government schools with secondary enrolments, on their School to Work activities indicate that consistently over 70 per cent are providing enterprising learning opportunities for their students.

*The Enterprise Education Action Research Project* was another Commonwealth initiative conducted in approximately 200 primary and secondary schools over the period of April 2002 to April 2004. This was the first comprehensive national analysis of enterprise education in Australian schools, demonstrating the key elements for successful implementation of enterprise education (DEEWR, 2004).

*The Vocational Training System*, through Technical and Further Education Institutions (TAFE) also provides limited support for entrepreneurial and managerial training for young people who select subjects that allow credit transfer to HSC. TAFE courses are conducted with industry inputs and have also have an entrepreneurial learning focus through business plan competition, project management and other managerial education (Russel et al 2008 and Noonan 2002).

*Youth 20* (Y20), the official platform for young people from across the Group of Twenty (G20) countries has recognised youth entrepreneurship to be the number one priority in *Y20 2014 Summit* (Y20Australia, 2014). *The Y20 Summit* adopted three main goals in introducing entrepreneurship as one of the key focuses:

* fostering the entrepreneurial spirit among youth. This can be achieved through the implementation of start-up initiatives and teaching about their value through school and university curriculums, entrepreneurship contests, rewarding the creation of start-up incubators and the resulting project launches, and creating institutions such as start-up promoting agencies and government-backed consultations on legal and financial issues
* reduce or delay start-up costs for young entrepreneurs by reducing tax rates for youth-run start-ups. Simplify legislation on the set-up, financing and expansion of start-ups, lowering the barriers to entry for young entrepreneurs
* micro-credit and credit program design within the framework of a national development strategy.

In Australia, the Certified Practicing Accountants (CPA) *Plan Your Own Enterprise* competition is designed to raise student awareness of small business management and planning principles and practices. It is targeted at Year 11 students and consists of a business planning competition; however these programs do not specifically address entrepreneurial education.

Another partnership scheme is the *NSW/ACT Young Achievers Award Australia*, which acknowledges, encourages and promotes the positive achievement of young Australians aged between 12 and 28. This program provides a link between education and industry and transformation of careers by the involvement of industry sponsors.

*The Business Skills Program* supported by the non-profit Young Achievement Australia,

is facilitated by mentors from business and universities and delivered outside school to groups of 15 to 25 young people for two hours a week over 16 to 24 weeks. Participants are required to “create, manufacture and market a product or service in a competitive environment”, thereby going through the stages of a business cycle “and take responsibility for all essential business processes, from selling shares and raising capital to liquidating the company” (YAA, 2014, p.2).

The Foundation for Young Australians also delivers a range of programs which are co-designed with young people to create social change in Australia. The foundation programs are aimed at networking and convening forums to bring young entrepreneurs into contact with business, innovators and industry leaders through a series of programs such as *$20 Boss, Propeller Project, and Work Inspiration* etc.

## Leadership in Entrepreneurial Learning

In school settings, building entrepreneurial culture and ethos largely depends on the school leadership. Some Australian schools have designed and developed programs such as *Imagination First* that have been running in selected schools since 2011 (Clements, 2014). These programs were possible due to entrepreneurial and creative teaching and learning of teachers and principals. School principals and teachers need opportunities to learn about entrepreneurial learning and the relevance of such education to developing general skills in students that may be useful in numerous life situations. They need opportunities to learn about being leaders of an entrepreneurial school; and such schools will have strong industry, community links and empathy towards social justice, equitable and inclusive development of students, teachers and community leaders. Such efforts need to be supported by industry and government efforts.

Several papers have examined the connection between leadership and entrepreneurial behaviours. Bagheri and Pihie (2011) studied the innate and exceptional characteristics of successful leaders and entrepreneurs in ‘traits’ theories, and the effects of followers and contextual factors on entrepreneurship and leadership activities. The authors present different aspects of entrepreneurial learning in the context of university entrepreneurship programs and propose a model for entrepreneurial leadership development and a competencies framework. This model defines entrepreneurial leadership development as a dynamic process of experiential, social interactive, observational and reflective learning which provides a foundation for entrepreneurial leadership practice, education and research.

DoE has also undertaken leadership development programs that have an indirect contribution to entrepreneurial learning. These projects include:

* the *NSW DoE Leadership Pathways* strategy, which supports students, staff and school leaders in developing their knowledge, understandings and capabilities across the three modes of achieving, adaptive and enabling leadership. The aim of this strategy is to develop personal efficacy, team building and systems leadership skills to support dynamic learning and school excellence. Specifically, this led to the redesign of the State Student Representative Council Annual Conference through the introduction of the *Imagination First and Leadership Pathways* approach
* a leadership pilot with the Shoalhaven community involving TAFE, business, university and schools to improve student engagement and future workforce opportunities
* a case study of the *Future Moves* project with Peak Hill Central School and Charles Sturt University
* the *Leadership Coaching Pilot* at Plumpton High School involving the co-design of school programs that model both students and teachers working together as coach-facilitators
* the Beacon Foundation and Social Ventures Australia to develop community-based student leadership and coaching programs to support the state *Leadership Pathways* strategy.

## 9.0 Pedagogical models of entrepreneurial learning

Designing, developing and implementing entrepreneurial learning in a schools setting is a challenging task for teachers and principals. Teachers need to adopt project based learning, student centred learning and teaching, empower students to come up with designs and ideas, manage multiple task and connection, link with curriculum, explore and develop external inputs, time table learning tasks, assess learning and managing parents expectations. The European Commission (2013) suggests that the best way to incorporate entrepreneurial learning into the school curriculum is through development of pilot programs, which enable schools to determine what works in a given setting.

Pedagogical approaches include action learning, self-directed learning, project based learning, learning by doing or learning from experience and a whole school approach as a way forward in entrepreneurial learning. Pittway and Cope (2007) and Powell (2013) point out that entrepreneurial educators face a dilemma in deciding appropriate pedagogy. A pedagogical choice between what entrepreneurial education is understood to be, and what entrepreneurial education is, must be decided upon.

Entrepreneurial pedagogy is context specific and will need to consider outcomes, processes and wider system issues such as career opportunities and empowerment of students to deal with complex future situations. Therefore, pedagogical structure, entrepreneurial efficacy, knowledge specificity, imitative learning and latent career preferences are all important. Effective entrepreneurial pedagogies may require teachers to work as facilitators of their students’ learning.

A distinction has been made between traditional educational practice, which concerns interpreting, understanding and analysing data and information, and more intuitive learning by observation and experimentation. Powell (2013) argues that in reality, entrepreneurs have little time for critical analysis and are more pragmatic and use intuition or gut feeling for taking necessary action at the right time.

In a classroom situation, there is a heavy reliance on “expert validation”. However, it is difficult to find an “expert” in the areas of innovation and entrepreneurship. Rather than providing prescriptive solutions, it is necessary to provide an environment conducive to students thinking independently and creatively in a self-motivated state.

A pedagogical model of entrepreneurial ‘Know Why’ is proposed as a suggestive comparison of passive versus active learning. Interactive delivery within venture creation was found to be a critical element in facilitating entrepreneurial learning.

However, it is also recognised that challenges for action-based learning include a greater element of non-traditional teaching. To be effective in entrepreneurial education, pedagogy requires a shift in perspective from teaching to learning on the part of the teacher. In other words, the teacher needs to become a mentor and facilitator for students to generate new ideas, designs and actions that lead to independent creation. In other words, personalised learning is an important learning component, which develops the Know Why component for nascent entrepreneurs in the process of becoming entrepreneurial (Middleton and Donnellon, 2014), They maintain that ‘Know Why’ is seen as the missing pedagogical component of successful entrepreneurial education programs in promoting reflective and evaluative entrepreneurs.

Rae (2005) investigates the learning structures and opportunities that are available or suitable for mid to late career entrepreneurs (aged 35–55 years). Participants were part-time management students completing a module in entrepreneurial management. The module was an opportunity-centred approach based on identification, investigation and planning an opportunity. The author found that opportunity recognition had a strong contextual and social aspect, making it more likely to occur in mid-career entrepreneurial learning. Activity-and discovery-based learning tended to stimulate the use of a range of investigative methods which reduced assumptions made by identifying weaknesses in business concepts. Experiential, social and discovery-based learning methods of active opportunity exploration best suited learners. The module enabled students to recognise, build on and identify how to transfer existing managerial and work skills to entrepreneurial activity. The most consistent outcome was improved ability for informed decision-making. Internal locus of control was shown to be a factor in likelihood of success, as opposed to externally-oriented control.

Wang and Chugh (2007, p6) review the literature on entrepreneurial learning based on 75 articles, and they define the entrepreneurial process as: “the process by which individuals– either on their own or inside organisations–pursue opportunities without regard to the resources they currently control”. In their analysis, three key learning types are discussed at length: individual and collective learning, exploratory and exploitative learning and intuitive and sensing learning. The authors suggest that identifying entrepreneurial opportunity is one of the key concepts that define the scope and boundaries of entrepreneurship. Such opportunities provide situations in which new goods, services, raw materials, markets and organising methods can be introduced through the formation of new means, ends or means–ends relationships. The paper argues that three entrepreneurial learning pedagogies -individual and collective learning, exploratory and exploitative learning, and intuitive and sensing learning need more attention.

The OECD study on the *Evaluating of Programmes Concerning Education for Entrepreneurship* (OECD 2009) examines the ways to systematically apply and evaluate education in entrepreneurship programs. The report points out that education for entrepreneurship is concerned with the inculcation of a range of skills and attributes, including the ability to think creatively, to work in teams, to manage risk and handle uncertainty. These skills need to be cultivated and run through the entire life cycle of innovation. As a result, any evaluation has to be conducted as a longitudinal element in any evaluation of impact.

The report also suggests that it is important to recognise that entrepreneurial skills and attributes can be applied in all situations, social, work and non-work context. The report suggests that entrepreneurial programs could be delivered in three forms:

* education programmes
* award schemes
* partnership schemes.

The OECD report (2009) on Evaluation of Programmes Concerning Education for Entrepreneurship emphasises that education for entrepreneurship programmes can be delivered at different levels of the education system, with some programs delivered by private industry, foundations and voluntary organisations. Entrepreneurial skills and attitudes are not confined to business development and they can be applied in work organisations of all types, as well as non-work settings, such as finding solutions to social issues.

Pittaway and Thorpe (2012) discuss the work of Jason Cope and his contribution to entrepreneurial learning. Cope’s conceptual framework examines different types of learning such as learning by doing, reflective learning, situated learning and learning through crisis that leads to critical reflection and leads to higher forms of learning.

Cope makes the distinction between two forms of entrepreneurial learning–‘learning by doing’ and ‘learning through critical episodes or events’–to show that whilst entrepreneurs are action-oriented and learning inherently experience-based, ”entrepreneurial learning does in fact reflect the importance of experience as a central consideration of all learning’ and that for researchers to understand entrepreneurial learning fully they must go beyond this to ‘explore more deeply how entrepreneurs learn” (Cope 2003, p.430). This suggests students need to cultivate skills in self-awareness and specific training in self-reflection skills.

## 10. Entrepreneurship for All

Is entrepreneurial learning for everyone? Given the reality that not everyone can or wants to become an entrepreneur, how can the education of student development best be nurtured though entrepreneurial learning? Rodov and Truong (2015) shows that while society innovates, school children (K-12) have remained stagnant and the schooling system is not graduating the doers, makers and cutting edge thinkers the world needs. They argue that school need not teach these skills on their own and can reach out to many organisations that help teachers bring necessary skills and hands-on project to schools.

Growing concerns of entrepreneurial initiatives are the issues of access, equity, quality and sustainability. The United Nations Industry Development Organisation (UNIDO) for example, developed a series of programs to address poverty reduction in rural areas and engagement of women in entrepreneurial activities through the *Entrepreneurship Curriculum Program*.

The curriculum is action-oriented: more than 50 per cent of the program’s time consists of practical research in identifying business opportunities, assessing resources for setting up and steering a business, and learning from successful entrepreneurs in their companies and in the classroom (UNIDO, 2014). Equity of access to entrepreneurial learning programs can be informed by literature that considers rural entrepreneurship.

A research report of the Institute for Rural Affairs (2006) argues that many entrepreneurship-focused development strategies fail because they do not have a human development focus. They should foster entrepreneurs who grow businesses, add value and contribute to economies and social development by transforming rural communities and regions.

Equity of access to entrepreneurial learning programs can be informed by literature that considers rural entrepreneurship. Smallbone (2004) outlines challenges and opportunities for OECD countries to increase entrepreneurship in rural and remote areas using business environment characteristics and rural characteristics, including distinctiveness and capability of generating entrepreneurship. It is concerned with the transference of contextual policy creation ideas in many OECD countries and the effect of pertinent rural policy measures to improving entrepreneurship, particularly in rural East Germany. Policy recommendations are suggested for five critical areas of reform based on the OECD report findings, in relation to culture, diversification, integration, networking and innovation.

## 11.0 Summary and conclusions

Entrepreneurial learning is multi-faceted and contextual. The multifaceted nature derives from the subtlety and complexity of the process. The process can be unique in many cases and learners require learning?? to transform creative processes into usable products and processes. Learning also requires understanding the dynamics of creative industries that are situated in a particular context of development.?? The focus on 21st century learning, particularly the attributes of problem-solving, innovation, creation, collaboration and risk-taking are vital elements for strengthening entrepreneurship.

There are some common themes appearing from the entrepreneurial learning literature:

* Entrepreneurship development is about the development of human beings, their capabilities, aspirations and how they work and balance life.
* Entrepreneurial learning enables the individual to create value by starting new activities or improving existing activities, by thinking independently, dealing with uncertainty and identifying and capturing new opportunities that are valuable and socially meaningful.
* Education and training opportunities in entrepreneurship at every level of the education system are essential.
* Entrepreneurship is associated with human resource and capability building– working out what opportunities are available to fully develop human capabilities.
* Entrepreneurial learning provides opportunities for primary and secondary students to learn general capabilities that relate to real life situations and to support career- related knowledge and skills.
* Entrepreneurial learning requires a systems approach whereby learning is integrated into whole school learning.
* Entrepreneurial learning requires a broadening mindset from a focus on economic development to a broader range of entrepreneurial activities and outcomes.
* Entrepreneurial learning sits at the heart of an entrepreneurial ecosystem in many countries and their governments remain strongly committed to cultivating and shaping young people’s mindsets, attitudes and skills in entrepreneurial activity as a future investment.

Entrepreneurial learning requires structured planning, resourcing and initiatives to ‘grow’ entrepreneurialism. There is a need to teach entrepreneurship as a whole school approach where specific groups of students may be targeted and support for teachers is provided. Support for collaboration among primary/secondary educators, universities and businesses is also a critical requirement.

Entrepreneurial learning is an investment for the future that education institutions cannot ignore. There is a need to develop programs and actions together with industry involvement to develop structured pedagogy that assists developing specific competencies and skills that address entrepreneurial culture, and ethos among primary and secondary school students.

This can be achieved by implementing the following strategic action:

* Develop a strong case for the central position of entrepreneurial learning in the school curriculum and more broadly in schools.
* Develop targeted programs for niche student populations to inspire, promote and cultivate entrepreneurial learning and connect students in regions, nationally and globally.
* Develop curriculum and pedagogy suitable for whole school and community approaches to entrepreneurial learning.
* Support an entrepreneurial paradigm that underpins existing curriculum and education stakeholders.
* Support networks and collaborative action that develops awareness and empathy for entrepreneurial learning and culture.
* Develop educational initiatives to foster, support and cultivate entrepreneurial characteristics, behaviour and intention.
* Collaborate with industry and external partners to develop action oriented pilot programs that can be developed in partnership with selected schools and regions to nurture entrepreneurial learning process, entrepreneurial culture and entrepreneurial achievements in schools.

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