

Entrepreneurial or innovation, not just another “Buzz” word – thoughts from a teacher educator

The world about us

I think it is fair to say that there are few people that will argue that the world as we know it is not only changing, but over the last years has changed almost beyond recognition. Explosions in technology, particularly digital technology, has meant that we live our lives differently. Social media connects us on a global basis; working practices are flexible. Everything is immediate; everything is connected. We live within a global network, indeed innovation means many things we once believed would only ever exist in the movies or in science fiction are becoming fact. Driverless cars; artificial intelligence, video communications with the other side of the world.

To enable us to take this “brave new world” and make a success of it we need to transform ourselves to be innovative and adaptable to change. We need to be able to question and challenge our philosophies and be willing to think and react in new and different ways to the opportunities now available to every one of us.

I have always taught my students that as educators we are educating our next generation to operate and live in a world, which is still on the drawing board, a world that is yet to be invented. The revolution of change has not yet finished, new opportunities are waiting. The world is becoming increasingly entrepreneurial and innovative. This being the

case, education has to match that innovation.

To enable us to help educate our next generation for these opportunities I would argue that we need to develop new skills, and to me the answer is the EntreComp framework and EntreAssess, for how else do you measure qualities such as creativity and innovation.

But, what do you think?

In my position as a teacher educator I have the opportunity to connect with a wide variety of teachers and academics from a variety of subjects; teaching at a variety of stages. I know some very innovative teachers and I know teachers who only equate entrepreneurial skills with business. Comments like, “yes, that’s all well and good, but I teach Geography, or Maths...” abound. And yes whilst the EntreComp and EntreAssess focuses on three main competences enabling actions such as dealing with ***ideas and opportunities***, using ***resources*** getting ***into action***.

Within these three focal points are further competencies which relate to the brave new world I referred to earlier and I would argue are crucial in supporting and developing the *next generation of learners who can embrace change and live their lives to the full.*



EntreComp Framework
(Bacigalupo et al, 2016)

To support this view I want to ask you to complete a little task, whether you be a teacher of a specialism or whether you have a special interest in a domain of learning, the most important part of your classroom or learning environment should be your learners.

Which one of you doesn't want an entrepreneurial learner: one who can spot opportunities in life as well as in learning?

A learner who has vision and is creative, a creative learner is able to generate ideas, use divergent thinking to create opportunities and look past what those ideas are to what they could become. A learner who can accomplish all this in a sustainable and ethical manner. Competencies such as this can turn compulsory education into a desire to continue learning throughout life.

How about learners who are able to motivate themselves and others, generating an excitement about learning. Learners who have a resilience to learn from their mistakes and turn that failure into a positive experience; developing the sort of attitude that enables them to take control of their own learning. Learners such as this are likely to be able to recreate the learning to suit their own needs.

There is much evidence that collaboration and social interaction can promote learning, indeed the socio-constructivist learning theories are built on that premise. So how about learners who can successfully collaborate with their peers, planning and taking the initiative in the classroom and in life and in doing so becoming able to cope with both ambiguity and risk. If these are the sort of learners we want regardless of discipline, or age, then think about what these learners can contribute as they mature into citizens post education.

The Welsh perspective

Like many countries across Europe, Wales is undergoing massive curriculum change, a change which is starting in our foundation phase and continuing right the way through out secondary education, with hoped for impacts up to Higher Education?

One of the aims of our new education is the creation of a curriculum which will support pupils who are ready for the 21st century and all it has to offer. To do this the review of our current education system, Successful futures (Donaldson 2015), suggests that Wales needs to create a new type of citizen through education that the citizen of Wales should be:

*“Ambitious, capable learners who are ready to learn throughout their lives. Enterprising, creative contributors who are ready to play a full part in life and work. Ethical, informed citizens who are ready to be citizens of **Wales** and the world.”*



Four Purposes of Wales
(Donaldson, 2015)

I believe this to be an inspiring and exciting aim of Wales and the Welsh curriculum, I also believe that if you unpick what the review means by, ***Ambitious capable learners; Enterprising Creative contributors; Ethical informed citizens and Healthy, Confident individuals*** then there is a resonance between developing this “Citizen of Wales” and developing the skills which lie at the heart of the EntreComp and EntreAssess frameworks.

In short we need to promote a culture of creativity in education, a place where our learners can learn by their mistakes, where they have a resilience which allows them to accept failure as a positive learning experience. Where they have the self-efficacy and self-esteem to make things happen.

An education where motivation turns to excitement.



Dr Jan Barnes, Senior lecturer in 'Cross curriculum close to practice research and enquiry', University of Wales Trinity Saint David, Wales (UK)

San José De Calasanz School

In summary: San Jose de Calasanz School provides primary and secondary education, and vocational training for young adults. Each educational stage includes the development and assessment of transversal entrepreneurial competences and the School, through a project called “Emprender para aprender”, models best practice in project-based training in this subject area.



Age group: Compulsory education (12-16 years) and vocational training (>16 years).

Initial challenges: As a vocational school,, San Jose de Calasanz are in direct contact with nearby enterprises and, through the relationships developed, have identified he need to develop transversal competences with their students to promote successful future employment. The school is committed

to entrepreneurship programmes as being the key in developing an entrepreneurial spirit, combined with transformed learning and teaching methodologies, assessment systems and facilities.

What they did about it: Using entrepreneurial education as a guiding principle, active learning and teaching methodologies have been incorporated into all educational stages within the School. Students' entrepreneurial competences are assessed and graded by both teachers and through peer-assessment and contribute up to 25% of the final grade. Students take part in multiple entrepreneurship programmes and activities including: creating ideas; recognising business opportunities; creating companies; and managing and taking part in entrepreneurship fairs. Teaching staff have received intensive training in methodologies associated with the development and assessment of entrepreneurial skills and the School has developed digital tools that facilitate the assessment and monitoring of the students' learning process.

Results: After adapting to several changes, the learning system of the school has been transformed entirely, especially now that it is based on the assessment of competences developed and demonstrated by the students. The motivation of students has increased substantially, and tools and materials have been created in order to support project-based education and learning. The school has received much external appreciation due to various projects developed by students and teachers.

Relevance for entrepreneurial teaching: Student and teachers' satisfaction, motivation, self-confidence and entrepreneurial competences have been shown to have increased significantly through the learning and teaching approach adopted and the involvement of external enterprises.

Method and applied assessment tools: The "Emprender para aprender" project applies the SET (by TEKNIKA) assessment tool, which allows more personalised assessment and

monitoring.

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Personal attributes – pilot results

In short: The personal attributes scale was tried out in a school in Reykjavík in 2016. The list of attributes was selected by the researcher. The aim was to get as broad an overview as possible of how teenagers understand their own attributes, with the emphasis being on entrepreneurial attributes.

APPENDIX													
DESIREBLE as opposed to correspondingly UNDESIRABLE QUALITIES													
LEADERSHIP												LACK OF INFLUENCE	
INITIATIVE												LACK OF INITIATIVE	
ENERGY												LAZINESS	
PERSEVERANCE												LACK OF STAMINA	
RESOLUTION												HESITANCY	
COURAGE												TIMIDITY	
CONFIDENCE												ANXIETY	
COOLNESS												EXCITABILITY	
ALERTNESS												STOLIDITY	
CONCENTRATION												LACK OF CONCENTRATION	
RESOURCE												HELPLESSNESS	
SINCERITY												INSINCERITY	
HONESTY												UNCDRUPULOUSNESS	
OBEDIENCE												REVOLT	
CONSCIENTIOUSNESS												CAPRICE	
WILLINGNESS												RELUCTANCE	
COOLITY												INTRACTABILITY	
FRIENDLINESS												HOSTILITY	
ESPRIT DE CORPS												SELFISHNESS	
ADDOMMODATIYENESS												OBSTINAACY	
HULITY												CONCEIT	
GENEROSITY												GREED	
ORIGINALITY												CONVENTIONALITY	
ACCURACY												INEXACTITUDE	
ORDERLINESS												LACK OF SYSTEM	
SENSE OF HUMOUR												WANTING THIS SENSE	
IMAGINATION												UNIMAGINATIVE	
ATTENTION												INATTENTION	
LOGIC												SOPHISTRY	
TRUTHFULNESS												SUPTERFUGE	
GRACE												INSOLENCE	
HOIOUSNESS												MOROSENESS	
PATIENCE												IMPATIENCE	
FORESIGHT												LACK OF FORESIGHT	
OPENNESS												SECRETIVENESS	
50%													

Age group: 11 – 16 years old; 158 children in total.

Initial challenges: The challenge was to get students to acknowledge their attributes without someone else pointing things out to them.

What was done about it: The children were provided with a

sliding scale with attributes that are positioned as opposites. All of them were invited to fill out a pre-activity sheet and again at the end of the activities. Some of the activities were entrepreneurial in nature and others were science based.

Results: Initial results of this were firstly, that a large number of the children did not have the vocabulary or understanding of what that the concepts that were presented meant to be able to situate themselves on the sliding scale. Other results that were present in the data was that the boys were more likely to err on the side of positive than the girls. This gender bias was present in both the groups working on the entrepreneurial tasks and in the science groups. In the post activity sheets, there was a marked difference in both the understanding of the concepts and in that both genders were more honest in their replies. There was very little difference in the way that the children observed themselves as having entrepreneurial attributes, whether their activities were based in science or in entrepreneurial workshops. The results of using this tool to allow children to access their own attributes as persons and entrepreneurs suggests that it is not the content being taught at each time but the way the children are allowed to engage with the subjects that matter in the effective development of entrepreneurial skills and attributes.

Relevance for entrepreneurial teaching: Development of an entrepreneurial mindset, attributes or skills is all based on the ability of the individual child to be able to understand themselves as BEING entrepreneurial and not on their only knowing about or having partial training in entrepreneurial education.

Applied assessment methods and tools: The personal attribute tool can be categorised as performance assessment, self-assessment, and as being based on informative assessment.

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Pieter Groen College – secondary school

In short: Pieter Groen College is a secondary school in Katwijk, the Netherlands. This school is an important member of the Association of Schools for Entrepreneurial Learning. Pieter Groen College encourages students to take ownership of their own learning process.



Age group: Students are between 12 and 18 years old.

Initial challenges: Schools for Entrepreneurial Learning stimulate entrepreneurship with their students by creating personal learning goals and combining these with curricular aims. All students define, to some extent, their own learning path; they choose which lessons are important for them and which lessons they can skip. In addition, students undertake entrepreneurial projects which contribute to the development of entrepreneurial skills and attitudes. After years of experimentation, fixed curricular programs have been discontinued and instead, schools are encouraged to make choices around pedagogy, curriculum, teacher training and timetabling. Sharing experiences between schools and networking are one of the main goals of the Association.

What they did about it: Students and teachers in Pieter Groen College, with the support of the Association, undertake many entrepreneurial projects around social issues, as part of a special program has been set up for entrepreneurial students. Teacher training includes guidance on the implementation of the educational program, skills in how to coach entrepreneurial students and promotion of an entrepreneurial culture throughout the school.

Results: The School opened in September 2014 and today more than fifty students are undertaking the special entrepreneurial program while more than one thousand students are completing entrepreneurial projects. Almost all teachers within the School are trained in entrepreneurial education. The local community is also involved in supporting students and in designing work-based projects so that students have the opportunity to learn in a real-life context (e.g. a local company).

Relevance for entrepreneurial teaching: This example illustrates that it is not necessary to implement a fixed program of study when entrepreneurial learning is adopted throughout a school. In this way, each school, can make choices on learning and teaching that suits the history, goals, students, teachers and possibilities of its community.

Applied assessment methods and tools: Guidelines, entrepreneurial scans for students, personal portfolios and entrepreneurial training for teachers, such as the Iguana training and Quality for Innovation scan (Q4I).

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Pentrehafod School, Swansea

In short: The Enterprise Challenge was introduced as part of the Welsh Baccalaureate Qualification to develop entrepreneurial skills that will be essential in further education and employment. All students undertake a team activity to create a business proposal for an innovative product or service to satisfy a brief they are given.



Age group: Students are between 14 and 16 years old.

Initial challenges: The Enterprise Challenge requires the students to use skills they have not previously experienced, such as innovation, creativity and, in this context, teamworking. Assessment comprises of a combination of a written business proposal, skills audit and observation of the pitch. Students with limited literacy skills could be disadvantaged due to the written element even though they have demonstrated good entrepreneurial skills.

What they did about it: Students are introduced to mini challenges when joining the School in year 7 (11/12 years old) and each year thereafter, until they complete the Welsh Baccalaureate Enterprise Challenge in year 10 (15/16 years old). Before the final assessment there is a teaching and learning programme, which is taught by specialist teachers,

and another mini challenge. These are used to revise and develop both the pupils' entrepreneurial skills and the skills required to create their report.

Results: Students enjoy enterprise education due to the repeated exposure to the various mini challenges and the engaging and interactive teaching and learning programme. By the time the students have to complete their assessed Welsh Baccalaureate Enterprise Challenge, the students are able to complete a detailed Skills Audit with areas for development, understand how to write a SWOT analysis and the 5P's of Marketing (product, price, people, place, promotion). They have also learned about what makes an effective team and the skills required for different roles. When choosing their teams, students are aware of their strengths and weaknesses and use this information to ensure they are a member of a balanced team. This generally leads to a mixture of skills and abilities within each team and allows the students with weaker literacy, and other skills, to achieve higher marks.

Relevance for entrepreneurial teaching: Students gain a range of entrepreneurial and employability skills, such as an awareness of the shared responsibilities when working as a member of a team and how teamworking can make difficult challenges more manageable through sharing tasks. They also learn how to communicate, speak and listen to others, especially when choosing to work with team members who are not normally part of their friendship groups, and how to negotiate when there are disagreements.

Applied assessment methods and tools: Assessment of the Enterprise Challenge is through an assessment grid which assesses 'Creativity and Innovation', Personal Effectiveness' and 'Understanding the factors involved in an Enterprise Challenge'.

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Lauaxeta School

In short: Lauaxeta School is located in the Basque Country (Spain) and educates students in primary, secondary and Baccalaureate education. The School is considered to use a well-considered model in terms of competence-based training, and entrepreneurial projects in particular. In fact, the development of both an entrepreneurial spirit and entrepreneurial skills have been included in every education programme within the School.



Age group: Students between the ages of 12 and 16 years.

Initial challenges: The School identified a need for the right methodology to develop an entrepreneurial spirit among students between the ages of 16 and 18 years, as this was considered to be a key competence.

What they did about it: The School designed and introduced entrepreneurial skills programmes and associated assessment, as well as an annual school entrepreneurship fair. Students are tasked with going outside of the School to identify real issues and needs and the creation of business models to address those needs, ensuring that they create value and benefits for the community in line with social entrepreneurship principles.

Results: The introduction of entrepreneurship programmes, supported by the annual fair, had a positive impact on

students and their motivation, and contributed to the development of key competences, which are assessed and form part of the final grade.

Relevance for entrepreneurial teaching: The assessment of entrepreneurial skills has been seen to transform pupils as the active learning and teaching methodology adopted is motivational and has allowed students to play a leading role in the development of their social entrepreneurship projects.

Method and applied assessment tools: Students take part in self-assessment and peer-assessment by means of digital tools related to e-assessment.

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IES El Batán (Spain)

In short: IES El Batán is a public secondary/VET school located in Mieres (Asturias). Secondary and VET curricula both include entrepreneurship-related subjects. Project-based learning is an oft-used methodological approach in these subjects.



Age group: The assessment method described here was tested in

a class of 15-17 year old students.

Initial challenges: In this school, the assessment of project-based learning was mainly summative, and the focus was on the assessment of project products/outputs. Thus, two essential aspects were neglected:

- The need for a more systematic formative assessment aligned with new and more complex competence development requirements as the student progresses through school years;
- The need to instil a habit of self-assessment and peer-assessment in students so that they realise assessment is a tool for self-improvement that needs to be applied on a regular basis.

What they did about it:

- Student teams worked with a rubric based on an existing developmental progression for collaborative problem solving. In this model, the collaborative problem-solving process was split into four phases: 1. Opportunity identification; 2. Idea generation; 3. Idea selection and development; and 4. Communication and Assessment. The language of the descriptors needed some adaptation.
- An additional rubric for teamwork was used to assess the collaborative dimension of the problem-solving process. A system of colour stickers enabled students to identify progress in a visual and quick way on a daily basis. These rubrics were also used for peer-assessment in key moments of the project.

Results: Students reacted very positively to the assessment method (model + rubrics + colour stickers). They appreciated the fact that assessment is not only based on the final product. They became familiar with self- and peer-assessment, overcoming initial reluctance to assess their peers.

Relevance for entrepreneurial teaching: The structure of the collaborative problem-solving process, and a small set of observable behaviours associated with each phase described in plain language, helps students to know and understand what is expected from them.

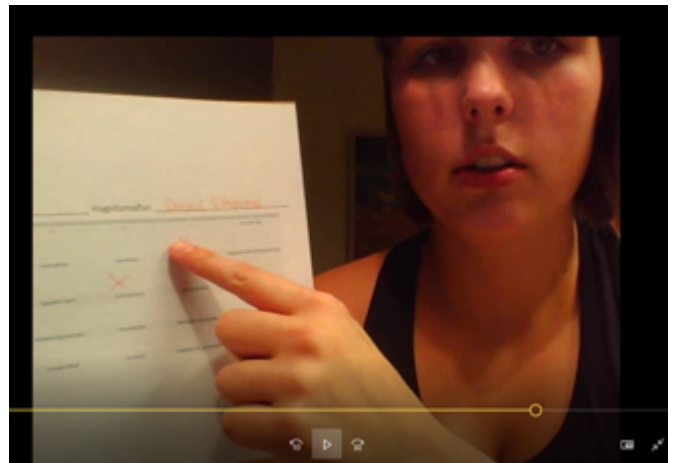
Applied assessment methods and tools: Rubrics, personal interviews, video-recorded pitches, final product and learning, observation check-lists, learning logs, peer-assessment sheets and teacher observation/log

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INNOENT Idea Evaluation Rubric

In short: This is an example of how the Idea Evaluation Rubric has been used in pre-primary initial teacher education in Iceland.



Age group: University – master level teacher education.

Initial challenges: The challenge identified here was related to the identity of the teachers as inventors and entrepreneurs.

What they did about it: The course within which the Idea Evaluation Rubric was applied was a pre-primary teacher course at the University of Iceland. There were 26 students registered on the course and it was a mixture of online and hands on workshops. During the whole course, the students were able to work through the innovation education and entrepreneurship education process as it is presented in Iceland. This means that all of them needed to take one need and work out solution/s and develop at least one idea to the stage of model or prototype, which they presented to the group. Students were asked to use the INNOENT Idea Evaluation Rubric to situate their idea/product and present that to the group.

Results: The results of the evaluation exercise showed that the student teachers were more confident in presenting their products/ideas when they could point out where they were in relation to the rubric and in some cases even explain why they had decided not to take the idea further.

Relevance for entrepreneurial teaching: This evaluation tool is relevant to entrepreneurial education as it supports the engagement of the individual in personal choice regarding the progression of their ideas and their production.

Applied assessment methods and tools: This tool can be viewed as ipsative assessment in that the participant is constantly looking at furthering the progression of their invention/idea. The tool is inherently self-directed and is digital in nature.

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Howells School, Cardiff

In short: Howells School is an independent school in Wales for girls aged 3 – 18 years and boys aged 16 – 18 years. The Simply Do Ideas tool was used by the Business and Economics Teacher during an enterprise day to facilitate self and peer assessment of learning.



Age group: Year 11 (15-16 years)

Initial challenges: To create employees of the future, ensuring they can work collaboratively and solve problems together.

What they did about it: Students elected to use either the quick fire poster (The Concept Canvas) or the technology of the on-line platform to invent retro products for the modern world. The tool provided a focus for considering customers and competition.

Results: The Simply Do Ideas tool provided a safe environment for the students to work in teams to experiment and take risks in problem solving, allowing them to acknowledge that some things did not work but that as a team they were able to identify solutions.

"Simply Do Ideas platform has had a significant and positive impact on the work we do. It has given our students the opportunity to approach enterprise activities in a fun, visual and creative way allowing them to develop collaborative, confident and creative problem-solving skills.... they've got skills that they're not being given opportunities to show in a classroom environment, but they will show in a smaller team

environment.” Rachel Jowett, Howell’s School, Cardiff

Relevance for entrepreneurial teaching: In addition to enhancing creativity, the students acquired listening skills, problem solving skills and communication skills. The students took risks and engaged in actions that took them outside of their comfort zone. Pitching skills were improved as the presentations were more effective than when using tools such as PowerPoint, as the students provided succinct and visual information that stakeholders, such as an investor, would want to know.

Applied assessment methods and tools: This is an example of formative assessment of learning, using reflection for self and peer assessment.

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Don Bosco VET School

In short: Don Bosco VET school is a Vocational Education and Training (VET) Center based in the Basque Country, Spain. The School uses the Skills Evaluation Tool of TKNIKA SET to assess and feedback on entrepreneurial skills, which contribute a percentage of the students’ final grade.



Age group: >16 years

Initial challenges: A vocational education and training

center's target is to create value for the student and to achieve employability for the student body in the labour market. Potential employing companies expressed the necessity for the students to develop entrepreneurial skills to increase the possibilities for labor integration and professional development.

What they did about it: Don Bosco has introduced active learning and teaching methodologies through the entrepreneurial skills development programs, substantially reducing the number of exams and traditional systems being used. The local business community is involved in the school where companies and entrepreneurs visit the school and suggest how the student body may collaborate in the solution of real entrepreneurial challenges. The students need to undertake entrepreneurship projects, providing solutions and added value to the companies involved. In addition, companies themselves visit the school when the process comes to an end to view and evaluate the solutions offered by the students. These entrepreneurship projects act to support the active learning and teaching methodology by helping to develop and assess the students' entrepreneurial skills. For that purpose, the School has moved from using more general assessment tools to the SET tool by TKNIKA in every Basque Country center.

Results: After several years of applying real entrepreneurship projects to the students' learning process, it can be said that Don Bosco has become an institution of reference for training students in entrepreneurial skills. The level of collaboration with the entrepreneurial network in the area, Guipuzcoa, has been reinforced and has allowed the creation of new projects. Also, the inclusion and the recognition obtained by the Center, students and projects, have been increased, both locally and internationally. The SET tool has been included in the evaluation, follow-up and development of entrepreneurial abilities, since it allows fast feedback and increased added value through the digital platforms offered in

this skills-based model.

Relevance for entrepreneurial teaching: The use of the entrepreneurial abilities assessment through SET has allowed for the incorporation of Entrepreneurship Education in most of the School; it offers potentiality in assessment through self and peer assessments linked to efficient and fast feedback in the tutoring process.

Applied assessment methods and tools: The Skills Evaluation Tool (SET) can be integrated throughout the whole assessment process, alongside self-evaluation and peer assessment of students and teachers.

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