



# Commercialising Innovation

An enterprise education module for STEM disciplines

June 2012

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## Commercialising Innovation Module

### Project contact details

The module framework contained within this document was devised and implemented at Cardiff University as part of an HESTEM and Cardiff University Student Enterprise project entitled 'Developing Enterprising STEM Graduates' that ran between 2011 and 2012. A discipline specific version of the module framework was successfully implemented as an optional 3<sup>rd</sup> year undergraduate module within Cardiff School of Engineering in the same academic year. The Engineering module descriptor can be found in the Appendix of this document.

The authors of the module framework and this document welcome questions, comment and feedback and can be contacted using the following details:

**Neil Coles** (Senior Enterprise Officer)

[colesn@cardiff.ac.uk](mailto:colesn@cardiff.ac.uk)  
029 2078 1442

Cardiff University  
Students Union  
Park Place  
Cardiff  
CF10 3QN  
Wales, UK

**Stuart Abbott** (Enterprise Officer)

[abbottsg2@cardiff.ac.uk](mailto:abbottsg2@cardiff.ac.uk)  
029 2078 1442

Cardiff University  
Students Union  
Park Place  
Cardiff  
CF10 3QN  
Wales, UK

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### An introduction to the module framework

“Module design requires a synthesis of information provision (students need to know something about enterprise) with the development of relevant skills (so that they are equipped for the task of enterprise) and delivered in such a way they get to understand the interpersonal and emotional aspects and get a feel of what is involved (a journey that takes them through an enterprise experience).”<sup>1</sup>

#### Core enterprise teaching and learning:

This enterprise learning module framework is intended to be adapted and scaled to suit the requirements of those seeking to implement it, or a variant of it, within a subject discipline or using a multidisciplinary approach. This framework provides a body of core teaching and learning designed to develop knowledge, understanding and enterprise skills associated with the commercialisation of innovation (primarily from within science based disciplines). The framework has been designed and developed with students of the STEM disciplines in mind but it is felt that it is relevant and useful for disciplines beyond.

#### Discipline, multidisciplinary or sector specific approaches:

In line with contemporary enterprise education best practices this module framework has been authored with multi-disciplinary implementation in mind. The opportunity for students of different disciplines to learn and work together within teams, particularly as part of the experiential learning scenario is an invaluable one, providing productive ground for cross fertilisation of ideas and learning perspectives. Such an approach where viable, serves to contribute to the simulation of real work place engendered by the experiential learning scenario and the component active learning tasks.

Those putting the framework into practice will need to provide discipline, multi-disciplinary, or industry sector specific contexts to many of the teaching and learning activities in order to make the delivered material meaningful and relevant to learners. Building on recognised pedagogical practice in the field of enterprise education, the learning activities (particularly the external speakers and case studies) should employ real world examples of innovation commercialisation or relevant aspects of it. Where possible such examples should be specific to the discipline(s) or relevant industry sectors. When delivering conceptual information or conducting class discussions, efforts should be made to locate the core enterprise concepts within real world contexts. Comprehension of the practical application of theoretical knowledge is fundamental to the successful and rounded development of practical skills.

#### External speakers and case studies:

Where possible external speakers from relevant discipline, industry or skilled backgrounds should be used to convey the necessary independent real world experience the module seeks to impart. In utilising such resources, teaching practitioners are not only enabling occasion for greater contextualisation of the core enterprise concepts and skills on the part of learners, but also demonstrating and providing opportunity for networking skills to be developed. Additionally such approaches provide circumstance for building greater bridges between employers and educators.

It is however recognised that securing suitable external speakers is not always a viable option. In such cases it is recommended that prepared case studies of real world individuals or

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<sup>1</sup> Handscombe, R. D., Rodriguez-Falcon, E. & Patterson, E. A. 2008. “Embedding enterprise in science and engineering departments”. *Education + Training*. 50:7, pp. 615-625

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organisations are used, ideally these should include discipline or sector specific examples which address the relevant subject topics.

### Problem-based experiential learning scenario:

The module framework is centred upon an ongoing experiential learning scenario which provides the simulated context for many component problem-based learning tasks intended to give learners active experience of applying enterprise skills and behaviours. Referred to as the Commercialisation Challenge (CC) throughout this module framework, the scenario sees participants form small group 'company teams' which will undertake a simulated commercialisation process. Learners will replicate processes involved in establishing a company and commercialising an innovation.

It is intended that the scenario is adapted to suit disciplines or industry sectors relevant to learners involved. Specifically, those implementing the framework will need to establish a product or service that individual company teams will 'commercialise' to ensure a common set of requirements and objectives for the company teams. For example, electrical engineering students could be asked to commercialise a smartphone app or chemistry students a chemical compound. The emphasis for learners within this exercise is an understanding of the commercialisation process and business feasibility of the product/service proposed by their company teams. Teams will *not* be expected to design or develop the product/service in detail, although they will need to establish a proposed 'functionality' in order to market their product and differentiate it from those of other teams (and indeed real world market competitors where relevant). In this respect discipline specific knowledge will be a valuable asset to learners.

The exercise should be viewed as an opportunity for individuals and company teams to learn from one another and cross fertilise ideas, simulating real world partnership and liaison. The company teams can be viewed as a network of groups with shared goals from dual perspectives: the scenario based objectives (goal of commercialisation) and as fellow learners with educational objectives (goals of summative assessment and long term learning). It is suggested that the exercise should not be *overtly* treated as a competition between company teams, although a little light hearted competition could be healthy for loosely simulating real world scenarios and therefore benefiting learning. Facilitators should gauge the situation as they see fit.

### Module structure:

"Module design requires a synthesis of information provision (students need to know something about enterprise) with the development of relevant skills (so that they are equipped for the task of enterprise) and delivered in such a way they get to understand the interpersonal and emotional aspects and get a feel of what is involved (a journey that takes them through an enterprise experience)." – Handscombe 2008

The module is structured in such a way that core enterprise learning is revisited and developed throughout the course. The signposting of future and past learning within the learning programme plays a key role in situating the learner on their learning pathway throughout the module and thus enabling them to more easily recognise and apply the multifaceted network of interrelated skills and concepts transmitted by the module.

This framework provides session outlines and suggests content for ten module sessions, each addressing key aspects of the Commercialisation process. It is expected that an implemented version of the module would include an additional session during which learners would deliver their assessed group presentations/pitches. It is also suggested that a final review session be

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included to provide opportunity for active and reflective feedback among participants. Such a session would provide a forum for group discussion regarding intended learning outcomes, acquired skills and experiences and their potential future application in the context of a career or venture start-up.

### Session structure:

#### Timings

Timings for component session activities have been deliberately omitted as it was felt overly prescriptive to include them. Each session is however designed with a two hour time slot in mind and those implementing a version of this module framework should adapt timings to suit their own needs.

#### Follow-up task/review

An important aspect of the module structure and the research work carried out by participants towards the Commercialisation Challenge is the Follow-up task and review sessions. These are structured so students are performing preliminary research prior to class-based learning. They could however be easily setup so that they are *consolidating* class based learning by moving the blank follow up task from the end (session 10) to the beginning.

The preliminary research into the session subject area serves a number of purposes: firstly it will introduce learners to the subject matter, thus providing a means of ensuring a level of base knowledge among learners which can be utilised by the module facilitator within class discussion; secondly the tasks are expected to aid personal learning development over the course of the module, which should be documented in the submitted reflective personal statement (possibly as a learning log); thirdly the tasks contribute to the company team's understanding of the Commercialisation Challenge. It is intended that relevant learning gained through these mini research tasks be applied and synthesised into the Commercialisation Challenge. Additionally they provide fertile grounds for discussion among company teams, facilitators may want to ask company teams to regularly log the research they perform as part of the follow-up tasks for submission as an Appendix to the Business Feasibility Report; finally the review aspect of the structure, to be held at the beginning of each session provides a chance for formative assessment, learning contextualisation, signposting and an opportunity to develop class discussion from the subject material by the session facilitator.

Expected review content will vary dependent on the subject matter being addressed. However it is to be treated as an opportunity for learners to demonstrate higher order learning skills. Content should be analytical and evaluative in nature and learners should seek to demonstrate their material and learning to the wider range of learning contexts in which the module engages them including: CC task; skills development; discipline specific contexts; real world examples; employability and professional development.

#### Context

This type of section is intended as a means of delivering core information central to the wider learning taking place within the module. Often following student led review sessions (see above), context sessions will communicate and consolidate key conceptual ideas whilst contextualising them in terms of practical application (eg. relating them to real world examples or the experiential learning tasks in which learners engage throughout the module). As such the form of the context session will likely vary dependent on situation: at times a fairly didactic presentation from the tutor will be called for in order to convey complex conceptual material whilst at the other end of the spectrum such sessions will take the format of mini seminars with an emphasis on tutor

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facilitated class discussion. Guidance is offered on the format of proposed context sessions but it is intended practitioners decide as appropriate to their/participants specific situation.

### Activity

Activity sections are simply group based active learning tasks intended to develop and contextualise learning.

### Assessment and feedback:

#### Summative assessment

Students should be made fully aware of their assessment requirements in the first session of the course. Attention should be drawn to the ongoing cumulative nature of the module content and that learning elements contained in many of the sessions will be expected to be evidenced within the various summative submissions. Students should be reminded to consider *how* the learning content covered in each session will be communicated within their work. The following are suggested methods for assessing learners as part of the module. A prescriptive breakdown of marks for each assignment is not suggested, practitioners should adapt as appropriate to their situation. An example of the breakdown used during the first implementation of the module in Cardiff School of Engineering is included as part of [Appendix A](#).

#### Reflective document

Academic pedagogical literature and more recently QAA guidelines for enterprise education have advocated the notion of the enterprise learner as a reflective practitioner who operates most effectively as part of a 'community of practice'.<sup>2</sup> This module aims to employ and build upon this notion, recognising the importance of reflection in personal development and deep level learning. As such learners should be expected to perform and submit a reflective document. This could take the form of a full scale ongoing reflective learning journal documenting an individual's learning development throughout the module and requiring regular submissions. Alternatively learners could be asked to submit a reflective statement at the end of the module detailing their analysis of their performance and evaluating their learning development. A successful reflective learning document should exhibit a capacity for reflecting upon:

- ability to contribute effectively to group activities and manage own time and resources in working towards group goals
- ability to influence relevant outcomes within enterprise situations (internal locus of control)
- development of confidence and belief through practice of enterprise skills and behaviours
- personal development needs, identified skills gaps and personal goal setting as well as means of addressing these

#### Business feasibility report

Company teams to submit an overall feasibility report focussing on the practicability of their proposed commercialisation. The content and many of the activities in which learners engage as part of the experiential learning scenario are intended to contribute to the development of a successful business feasibility report. It is therefore a means of appraising learning, understanding

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<sup>2</sup> Pittaway, L. & Cope, J. 2007. Simulating Entrepreneurial Learning: Integrating Experiential and Collaborative Approaches to Learning. *Management Learning*, 38:2, pp. 211-233.

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and application within these key areas. As such a feasibility report should consider some, if not all of the following areas:

- Identify a relevant company structure and offer reasoning for its use
- An outline business plan for the commercialisation of the product or service
  - Who will create it and how would be developed?
  - How it will generate revenue?
  - How much finance is required to develop and commercialise it?
  - Outlining the difference between the terms 'profit' and 'turnover' and highlight expected forecasts for each
- Outline intellectual property considerations when establishing a new commercial entity
  - Are any licences required?
- Undertake research and market analysis for proposed business idea
  - Who is the *App* is aimed at?
- Evaluate opportunities (and threats) for your proposed business

## Presentations

Company teams to present/pitch as a group as part of a session devoted to student presentations. The assessment could take a number of forms. Teams could be asked to present the product/service they are commercialising as if they were making a sales pitch with emphasis on marketing strategy. Alternatively they could be asked to present their findings regarding their research into the feasibility of their product/service with emphasis on analytic, evaluative and reflective skills.

## Formative assessment

The learning and teaching within this module is overtly practical in nature, seeking to develop not only knowledge and understanding of the commercialisation process but also engender requisite skills, behaviours and attributes. A key aspect of teaching to enable practical learning outcomes is the use of formative feedback assessment "to recognise, and respond to, student learning in order to enhance that learning, *during learning*".<sup>3</sup> It is important that those adapting this module framework give consideration to refining and clarifying intended learning outcomes of practical tasks in order that both learners and tutors have a benchmark by which to evaluate performance. Formative feedback should be used during delivery of the module to aid direction of learning individually, in small groups (learning scenario company teams) and for the benefit of the class as whole. It is suggested that this approach is highlighted to learners in the first session where an element of session time is devoted to communicating pedagogies and associated expectations to learners. In particular, formative feedback and direction is a valuable source for individual reflection on learning development as part of the summatively assessed reflective document.

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<sup>3</sup> Cowie and Bell 1999 cited in Pickford, R. and Brown, S. 2006. *Assessing Skills and Practice*. Abingdon, Oxon: Routledge.



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# QAA Enterprise and entrepreneurship education: draft guidance for UK higher education providers

The following grids collate the learning outcomes presented in the QAA Enterprise and Entrepreneurship Education draft guidance, issued in February 2012. The Commercialising Innovation module framework and its component activities have been aligned with these recommended learning outcomes, each session aiming to engender a range of them. The session descriptors highlight the primary learning outcomes relevant to that particular session using the reference codes we have created for this purpose (eg. CI1, B1). The reference codes simply utilise the sub-categories used by the QAA to organise and structure their presented learning outcomes. The QAA have organised the recommended learning outcomes into thematic and competency based groupings, before further splitting them into the sub-categories presented within the grids.

The full QAA draft document is available at [http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/EE\\_Draft\\_Guidance.pdf](http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/EE_Draft_Guidance.pdf).

## Theme based learning outcomes

### Theme

#### **Creativity and innovation – Students should be able to:**

- CI1 generate multiple ideas, concepts, proposals, solutions, or arguments independently and/or collaboratively in response to identified problems and opportunities
- CI2 think speculatively, employing both convergent and divergent approaches to arrive at appropriate solutions.

#### **Opportunity recognition, creation and evaluation – Students should be able to:**

- OP1 identify, analyse and respond to relevant opportunities
- OP2 develop and produce multiple solutions to identified problems, shortfalls and similar challenges
- OP3 be flexible and adaptable, seeing alternative perspectives and offering a choice of solutions
- OP4 review and evaluate multiple solutions in contexts that anticipate and accommodate change and contain elements of ambiguity, uncertainty and risk.

#### **Decision making supported by critical analysis and judgement**

- DM1 source and retrieve relevant contextualised information
- DM2 evaluate information and formulate arguments, both independently and in a team
- DM3 combine analysis with intuition and intuitive decision making, drawn from subject expertise and evaluation of critical incidents.

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### Implementation of ideas through leadership and management

II1 manage resources in response to a problem or need, demonstrating an enthusiasm for enquiry and the motivation to sustain it.

### Reflection and action

RA1 reflect upon, review and evaluate the solutions they have explored

RA2 identify personal development needs and other changing factors through the reflective process.

RA3 evaluate their own learning and respond to identified shortfalls (skills gaps)

RA4 show resourcefulness in seeking development guidance or mentoring from both external and internal contacts.

### Interpersonal skills

IS1 identify and respond to stakeholder needs

IS2 communicate enthusiasm to 'sell' new ideas, concepts or solutions

IS3 interact with others both to build trust for long-term relations and also to 'close the deal' to make things happen.

### Communication and strategy

CS1 employ visualisation and flexible planning skills to interact effectively with others, articulate ideas, and present information or outputs to audiences

CS2 draw on the views of others to inform the development or enhancement of their work

CS3 provide research and other evidence to suggest how ideas can be taken forward over time, taking changing environments and emerging technologies and concepts into account.

### Entrepreneurial effectiveness

EE1 apply appropriate business generation strategies

EE2 undertake tasks specific to new venture creation or putting an enterprising idea into action

EE3 appreciate the multiple forms of value potentially generated through entrepreneurship

EE4 meaningfully explain the fiscal, social, creative, environmental or other value of the products, services or ideas they generate

EE5 identify target markets and associated value mechanisms

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### Competency based learning outcomes grid

#### **Behaviours** **Students should be able to demonstrate:**

- B1 the ability to seek out, be alert to, and identify opportunities (opportunity recognition)
- B2 creative and innovative approaches (problem solving)
- B3 the initiative to act on perceived opportunities while considering risk factors (taking action)
- B4 independent responsibility for managing projects (managing autonomously)
- B5 the ability to reflect and persevere in challenging environments in pursuit of achieving desired objectives or goals (personal awareness)
- B6 use of social skills to build trust, relationships and networks and to communicate ideas and information (networking and communication)

#### **Attributes** **Students should be able to:**

- A1 recognise and achieve goals and ambitions, especially in response to challenge (goals and ambitions)
- A2 enhance self-confidence and belief through practice of enterprising skills and behaviours (self-confidence)
- A3 demonstrate perseverance, resilience and determination to achieve goals, especially within challenging situations (perseverance)
- A4 recognise that they are in control of their own destiny (internal locus of control) and use this understanding effectively within enterprising situations
- A5 take action and learn both from actions and active experimentation (action orientation)
- A6 innovate and offer creative solutions to challenging and complex problems (innovation and creativity)

#### **Skills** **Students should be able to:**

- S1 take creative and innovative approaches that are evidenced through multiple solutions and reflective processes (creativity and innovation)
- S2 persuade others through informed opinion and negotiate support for ideas (persuasion and negotiation)
- S3 manage a range of enterprise projects and situations appropriately, for example by proposing alternatives or taking a holistic approach (approach to management)
- S4 evaluate issues and make decisions in situations of ambiguity, uncertainty and risk (decision making)
- S5 use networking skills effectively, for example to build or validate ideas or to build support for ideas with potential colleagues or stakeholders (networking)
- S6 recognise patterns and opportunities in complex situations and environments (opportunity recognition)

## 1.0 Module introduction

### Session rationale

The aims of the first session are two-fold. Firstly it is intended to give learners a practical understanding of the learning approaches and methodologies utilised within the delivery of the module. The explicit communication of such pedagogies provides a foundational framework within which learners can begin to contextualise the intended enterprise learning and skills development outcomes, as well as the associated activities in which they are expected to engage. In this respect the session aims to introduce and promote the concept of 'enterprise awareness' among learners by considering the module content and approaches in terms of skills acquisition, behavioural development and the engendering of entrepreneurial effectiveness.

The methodological approach of the first session is extended beyond just that of pedagogical contexts. Secondly therefore, this session aims to provide learners with an initial foray into some fundamental aspects of innovative and enterprising processes. Learners are introduced to some core enterprise concepts and skills with a view to their continued use during subsequent module sessions/tasks. For example learners will: engage in the key employability skill of pitching and presenting; be familiarised with concepts such as divergent and convergent thinking by taking part in idea generation and evaluation processes; be asked to complete an evaluative self-assessment questionnaire in relation to particular entrepreneurial characteristics and capacities. All of these activities will be revisited and further applied as learners develop their enterprise awareness and skills during the course.

### Session aims

A student should:

- be aware of the intended teaching methods to be used during the module and recognise the participatory requirements expected of learners during its delivery.
- understand and be able to convey the relationship between their discipline and the 'commercialisation of innovation' from within it.
- be able to apply and articulate the relevance of 'pitching and presentation' as a key employability, enterprise and personal skill.
- engage in and appreciate the significance of idea generation and evaluation techniques in relation to innovation, enterprise and problem solving.
- be aware of the importance of complementary role definition within team building processes.
- be in a position to describe and self-assess a range of entrepreneurial characteristics and competencies.

### Learning outcomes

#### Thematic learning outcomes

CI2, OP3, DM2, DM3, II1, RA1, RA2, RA3, RA4, IS2, IS3, CS1, EE1, EE3

#### Competency based learning outcomes

B2, B5, B6, A1, A2, A4, A5, A6, S1, S5, S6

### Content description

#### Context: Introduction

**Module staff** – Personal introduction highlighting relevant academic and professional experiences.

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Session 1: Module introduction

**Enterprise education** – Enterprise and innovation skills are a key component of employability and professional skills. Overview of intended enterprise learning outcomes, skills, behaviours and attributes. Discipline specific contextualisation.

**Experiential learning approach** – Concise overview and intended benefits of experiential learning (PBL, EBL, TBL)

**Module assessment** – Overview of summative assessments and associated assessment criteria. Convey use of formative assessment approach and relate to notion of personal development and reflection.

**External speaker/case study programme** – Introduction and highlight relevance of intended speakers/case studies.

**Module reading list** – Enterprise and discipline specific reading list. Importance of reading, reflection and application.

### Context: Commercialisation Challenge overview

The Commercialisation Challenge is the primary experiential learning task within the module upon which summative module assessments are based. Spread over the length of the module, it is really an umbrella task that provides the context for many of the smaller problem-based learning activities with which learners will engage. Learners are expected to contribute fully to the various component tasks and in doing so reflect on their own learning progression. Distribute task information sheets.

### Activity: Enterprise learning questionnaire

Module participants will gain an initial overview of enterprise competencies and their potential application through a process of self-evaluation. In carrying out this task learners are engaging in self-assessment for self-development, a key aspect of the intended progression of enterprise/entrepreneurial self-awareness the module aims to engender.

### Activity: Pitch yourself

Contextualise pitching and presenting as a primary enterprise and employability skill. Learners to form their own groups of between 3-6 and then pitch brief personal introductions to their group. Individual pitches are to include brief overviews of personal achievements, skills, strengths and future ambitions. Groups are to then nominate a speaker who will summarise group strengths and skills to the class.

### Activity: Idea generation/evaluation – common object usage

As individuals, learners to use divergent thinking to generate as many uses (both daft and sensible) as possible for a common object (eg. coat hanger, red brick). Emphasise notion of judgement suspension and that madcap ideas can sometimes trigger/evolve very innovative ones. Facilitate brief class feedback of individual ideas. In groups learners to use convergent thinking to evaluate ideas according to relevant criteria (provide or have them establish their own) and then collate on flip chart paper before briefly presenting to class.

### Follow-up Task: Team role questionnaire

Familiarise learners with concept of self-evaluation in relation to team roles/dynamics. Introduce team role questionnaire (eg. Belbin) and ask participants to complete and return by an appropriate time in order that they can be analysed and used as a basis for forming Commercialisation Challenge teams.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Context:</b> Introduction	Introduce staff, teaching approaches, external speaker/case study programme and reading list.	Personal introductions highlighting experience. Deliver overview of pedagogical approaches, speaker/case study programme and reading list.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative.	IT equipment.	
<b>Context:</b> Commercialisation Challenge (CC) overview	Introduce learners to this umbrella task, related PBL sub-tasks and summative and formative module assessments.	Deliver overview of CC, contextualising it in terms of STEM discipline. Highlight module assessment criteria and processes.	Listening, analysis and evaluation – personal contextualisation and reflection.	Communicate importance of formative/reflective approaches. Establish summative assessment requirements.	Summative assessment processes and criteria (module handbook).	
<b>Activity:</b> Enterprise learning questionnaire	Familiarise learners with common enterprise skills in contexts of STEM discipline and self awareness/ evaluation/ development.	Give brief context to activity. Facilitate activity – respond to questions/queries.	Complete questionnaire. Personal reflection.	Formative/iterative. Convey relevance to reflective personal statement assessment.	Enterprise learning questionnaires.	
<b>Activity:</b> Pitch yourself	Contextualise pitching and presenting as a key employability skill. Give learners experience of delivering a personal introduction.	Give brief context to activity. Facilitate activity and feedback.	Form groups of 3-6. Individually pitch to group. Nominated group speaker to pitch collective group strengths to class.	Formative and iterative.		
<b>Activity:</b> Idea generation/evaluation – common object usage	Contextualise and give experience of creative, divergent and convergent thinking as strategic problem solving techniques.	Give brief context to activity. Facilitate activity and feedback.	Individually generate ideas. In groups collate and evaluate according to (identified or provided) criteria.	Formative and iterative.	Common object(s). Flip chart paper and pens.	
<b>Follow-up Task:</b> Team role questionnaire	Give experience of self assessment in with regards to team building/ roles/ dynamics in enterprise contexts. Relate to CC.	Give context to activity. Convey relevance to CC team formation.	Complete questionnaire. Personal reflection.	Formative/iterative. Convey relevance to reflective personal statement assessment.	Team role questionnaires.	

## 2.0 Forming your company

### Session rationale

The second session builds upon the first by commencing the primary experiential learning task with which learners will engage throughout the module, enabling participants to begin working together in their Commercialisation Challenge teams. The intention of this session is to generate a participatory 'team-building' active learning experience for the company teams. The session raises awareness of the practical importance of communication and strategy, interpersonal and problem solving skills for participants (both individually and as a group).

### Session aims

A student:

- should be able to articulate and critique the benefits of utilising identified team role dynamics using evaluative tools such as Belbin questionnaires.
- will have experience of and be able to analyse, the process of identifying and actively engaging with an individual team role (as identified by an individual's Belbin questionnaire results in this case) in a practical team setting.
- should be able to reflect upon tools such as Belbin questionnaires and the results they give, in the context of their own self-awareness and development.
- will have experience of and should be able to articulate the goals and benefits of team building exercises (particularly in relation to processes of innovation and commercialisation).
- should be able to constructively reflect upon their individual performance in the context of the team based activities.
- should be able to identify, analyse and contextualise differing team roles and dynamics in practical contexts.

### Learning outcomes

#### Thematic learning outcomes

CI1, CI2, OP2, OP4, DM1, DM2, RA1, IS3, CS1, CS2, CS3, EE1, EE2

#### Competency based learning outcomes

B2, B3, B5, B6, A2, A3, A5, A6, S1, S2, S3, S4, S5, S6

### Content description

#### Review: Completed team role questionnaires & CC teams

Learners will have completed and submitted team role questionnaires and Commercialisation Challenge teams drawn up accordingly. The session will physically introduce the newly formed company teams. As an icebreaker, team members to introduce themselves to one another and discuss their individual team role characteristics.

#### Context: Company and team development

Convey the concept/function of team roles/dynamics in creating innovative professional environments – where possible provide examples of discipline specific contexts. Analyses of team dynamics will be carried out using the company teams as a practical example. Correlate to future module learning activities and ongoing process of self evaluation/development, in doing so relate to the assessed reflective personal statement learners will undertake.

**Company Meeting: Company formation**

This is the first formal company meeting as part of the Commercialisation Challenge and is intended to establish the importance of team working skills. Company teams to decide on company name by the end of the current session. Team members to discuss their preferred roles and potential contributions they may make within the company, whilst recognising strengths and skills of other team members in order to maximise company potential.

**Activity: Team building tasks**

The main body of the session requires company teams to address three different problem based activities in turn, each requiring and promoting co-operative team dynamics. The problem based tasks used were taken from the Belbin learning pack and are designed to use and promote the team roles identified from the Belbin questionnaire. Adapt as required for alternative team building tools.

During activities learners should: reflect on the practical application of team roles/dynamics; self-evaluate with regards to role fulfilment and team participation; observe and manage other team personnel in relation to proposed team roles and team objectives.

**Follow-up Task: Discipline specific companies who have commercialised innovation**

Outline the ongoing follow-up/review format used within module (see introductory notes). For this task teams are to research, analyse and evaluate real world discipline/sector specific companies that have employed processes of product/service innovation and subsequently commercialised them

Where relevant, learners may wish to consider the following:

- What techniques/approaches were employed by the company in order to innovate?
- How has the company sort to distinguish itself/product/service from competitors in the eyes of potential customers?



Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Completed team role questionnaires & CC teams	Unveiling, introduction and 'icebreaking' of CC teams. Learner engagement with team role characteristics.	Give brief context to session and activities. Facilitate activity – respond to questions/queries.	Get into proscribed teams. Learners to discuss and reflect on their team role characteristics.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> Company and team development	Contextualise team building/roles/dynamics as aspects of self-development and valuable professional tools.	Deliver overview of team building/roles.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Relate to demonstrating learning progression in reflective module assessments.		
<b>Company Meeting:</b> Company formation	Apply and develop understanding of team roles and dynamics.	Facilitate as required.	Identify key strengths of team and begin to define basic team strategy.	Formative/iterative. Personal reflection – log learning and development.		
<b>Activity:</b> Team building tasks	CC team building. Experiential learning regarding team roles/dynamics/building.	Facilitate activities. Keep strict time: Each activity = 20mins Feedback = 10mins	Engage in activities	Formative/iterative. Personal reflection.	Onscreen timer. Instructional print outs. Upload (Belbin) task learning packs.	
<b>Follow-up Task:</b> Discipline specific companies who have commercialised innovation	Introduce module Follow-up task/Review format. Introduce discipline specific examples of innovation commercialisation.	Deliver overview of follow-up tasks/review module format. Contextualise 'processes of innovation' within relevant STEM discipline.	Listening, research, investigation, analysis, synthesis and evaluation. Apply research in context of CC.	Formative/iterative. Personal reflection.		

## 3.0 The process of commercialising innovation

### Session rationale

This session aims to highlight the employability value gained from commercial awareness whilst contextualising future learning. Learners will engage with the key processes of innovation commercialisation whilst deepening their understanding and experience of associated skill/attitude requirements. A key aim is to make abstract concepts relevant by situating them in real world examples and the development of the experiential learning scenario. The session will introduce the Commercialisation Challenge, the core experiential learning scenario which will provide the basis for many future learning tasks. As such learners will be familiarised with the concept of opportunity recognition in order that they can begin analysing and applying their learning in the context of the CC.

### Session aims

A student:

- will have experience of communicating case study oriented research on real world examples of corporate innovation and commercialisation.
- should be able to recognise and discuss examples of discipline specific companies who have implemented and undergone processes of commercialisation.
- should be able to describe the links between creativity, invention, innovation, opportunity and entrepreneurship.
- should be able to describe and apply techniques for opportunity recognition.
- will have experience of in depth analysis and evaluation of the real world experiences of an individual (external speaker) or organisation (prepared case study) that has commercialised a discipline/sector relevant product or service.
- will have experience of working as part of a team in order to strategically analyse problems and challenges, generate speculative approaches/solutions and evaluate those proposed.
- will be aware of the function and component aspects of a business plan in the context of strategic financial/resource analysis, planning and implementation.

### Learning outcomes

#### Thematic learning outcomes

CI1, CI2, OP1, OP2, OP3, OP4, DM1, DM2, DM3, II1, RA1, RA2, RA3, RA4, IS1, IS2, IS3, CS1, CS2, CS3, EE1, EE2, EE5

#### Competency based learning outcomes

B1, B2, B4, B5, B6, A1, A2, A3, A4, A5, A6, S1, S2, S3, S4, S5, S6

### Content description

#### **Review:** Discipline specific companies who have commercialised innovation

Company teams to present their research findings. Content should not be purely descriptive but should demonstrate higher order learning skills eg. analytical, evaluative and strategic contextualisation of their findings.

#### **Context:** Processes involved in commercialising innovation

Reviews to be consolidated by tutor led class discussion (ideally involving external speaker or making reference to prepared case study). This context session should: develop points raised in reviews; communicate an overview of commercialisation processes; highlight techniques for

## **Commercialising Innovation Module**

Session 3: The process of commercialising innovation

opportunity recognition; signpost future learning areas to be further considered in later module sessions; highlight relevant policy advocating graduate commercial awareness as key to employability (see resources); provide context for the following external speaker/prepared case study. Steps should be taken to communicate processes in both theoretical and practical terms in order that learners can envisage the application of processes in a range of situations and environments.

### **External speaker/Prepared Case study:**

Either format will outline elements of a real world commercialisation process, giving learners an opportunity to consider these in an applied environment. As such, it is suggested that human 'warts and all' experiences are emphasised as far as possible (as opposed to sterile theoretical emphases).

### **Context: Commercialisation Challenge (CC)**

This context session will introduce learners to the Commercialisation Challenge which will have been given a disciplinary/sector specific context. Situate the task in terms of prior learning/session content and relevant examples of similar product/service commercialisations. Distribute task information sheet. Relate to Feasibility Study summative assessment requirements. Communicate role of opportunity recognition with regards to generating ideas for a response.

### **Company Meeting: Commercialisation Challenge**

This meeting provides an opportunity for learners to begin applying prior learning in context of the CC and in doing so develop a company response to the challenge. Learners should apply their understanding of opportunity recognition with a view to gaining a fuller picture of the Commercialisation Challenge opportunities that the related sector may hold.

### **Follow-up Task: Identify and investigate possible headings of a company business plan**

The session concludes with an overview of the follow-up task which will ask learners to consider possible headings of a company business plans.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Discipline specific companies who have commercialised innovation	Highlight real world discipline specific examples of innovation commercialisation in analytical, evaluative and strategic manner.	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> Processes involved in commercialising innovation	Highlight employment value of commercial awareness. Overview of key elements of commercialisation process whilst signposting future learning.	Facilitate discussion. Relate prior team reviews and subsequent speaker/case study.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>External speaker/Case study:</b> TBC	Highlight elements of the process involved in commercialising an innovation within relevant discipline/sector.	Facilitate as required.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Context:</b> Commercialisation Challenge (CC)	Introduce learners to the discipline/sector adapted CC. Highlight relevance to Feasibility Study component of summative assessment.	Deliver overview of CC, contextualising it in terms of STEM discipline. Highlight relevant assessment criteria.	Discuss prior learning in context of CC. Apply opportunity recognition techniques.	Formative/iterative. Personal reflection. Highlight importance in Feasibility Study summative assessment.		
<b>Company Meeting:</b> Commercialisation Challenge	Apply understanding of commercialisation and innovation processes. Consider and evaluate range of solutions.	Facilitate as required.	Consider response to CC.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Identify and investigate possible headings of a company business plan	Introduce function and structure of business plans in context of innovation commercialisation.	Direct intended learning and context.	Listening, research, investigation, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection. Highlight relevance to summative assessments and personal development.		

## 4.0 Business planning and company structures

### Session rationale

This session seeks to engage learners with the purpose and processes involved in strategic business planning and company structures. Both are central to the experiential learning scenario and its associated tasks and assessments. It is important learners recognise the value of strategic planning for any business endeavour, but particularly for new ventures. It may be useful to highlight the close parallel between strategic planning for learning and business. Both share many of the same core analytic, planning and evaluative skills. Both result in the setting of goals which become markers by which performance can be evaluated.

### Session aims

A student:

- should be able to explain the function of a business plan and its component elements in relation to new venture creation.
- should be able to prepare and apply a business plan in the context of a new venture, whilst recognising its relevance to other aspects of the commercialisation process.
- should be able to distinguish, analyse and appraise differing company structures in relation to differing business contexts.
- should be able to decide on an appropriate company structure for a new venture
- will understand the purpose and have experience of using strategic planning/business analysis tools.

### Learning outcomes

#### Thematic learning outcomes

CI1, CI2, OP3, OP4, DM1, DM2, DM3, II1, RA1, RA2, RA3, RA4, IS1, IS3, CS2, CS3, EE1, EE2, EE4, EE5

#### Competency based learning outcomes

B3, B3, B4, B5, B6, A2, A4, A5, A6, S1, S3, S4, S6

### Content description

#### Review: Identify and investigate possible headings of a business plan

Learners to present their findings from previous follow-up task which required the investigation into possible business plan headings. Content should demonstrate a strategic awareness of their findings.

#### Context: The function and benefits of a business plan

Reviews to be consolidated by a tutor presentation and class discussion which should: develop points raised in reviews; explain function of business plans in determining feasibility of new ventures; highlight the relevance of business planning skills in module assessments.

#### Company Meeting: Discuss and establish your company's business plan

This meeting requires CC teams to establish a preliminary company business plan that will provide a sustainable basis for implementing their commercialisation.

#### Context/activity: Company structures

Highlight differences between high growth and lifestyle businesses. This can provide a starting point for succinct overview of company structures. Learners will then take part in a brief learning

activity which will demonstrate how equity investment and share ownership works within private limited companies.

**Activity: Strategic planning**

Learners will be introduced to the role and benefits of strategic planning in the context of commercialisation. Brief examples of business analysis/strategic planning techniques and their advantages will be provided (eg. SWOT, PESTLE, MOST). Learners will then carry out a basic SWOT analysis on their CC team's response to the Commercialisation Challenge.

**Company Meeting: Discuss and establish your company's structure**

This second company meeting of the session will see teams establish and justify a CC company structure. Where relevant the meeting should incorporate and build upon the previous work carried out regarding business and strategic planning.

**Follow-up Task: Generate a personal financial forecast for the coming year**

Learners to generate an individual financial forecast covering all their perceived incomings and outgoings for the coming year. The aim of this exercise is to familiarise and highlight the importance of forecasting and recording finances. Students should conclude whether they are forecast to make a profit or loss. It is likely *some* students will miss important aspects of their finances (rent, subsistence costs, certain bills), this will make for an interesting and light-hearted review session.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Identify and investigate possible headings of a business plan	Highlight function and key elements of business plans in analytical, evaluative and strategic manner.	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> The function and benefits of a business plan	Familiarise learners with role of business plan in determining venture goals, feasibility and means. Highlight relevance to module assessments.	Facilitate discussion.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection. Highlight importance in Feasibility Study summative assessment.		
<b>Company Meeting:</b> Discuss and establish elements of your company's business plan	Apply understanding of business planning. Formulate business plan for CC/CC scenario.	Facilitate as required.	Establish preliminary company business plan.	Formative/iterative. Personal reflection – log learning and development.		
<b>Context:</b> Company structures	Familiarise learners with differing company structures. Put concepts into scenarios based practice through share demo.	Facilitate discussion. Convey importance to Feasibility Study summative assessment.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.	Share demo equipment.	
<b>Activity:</b> Strategic planning	Familiarise learners with strategic planning approaches and give experience of their application.	Brief contextualisation of importance and examples of strategic planning. Facilitate CC/CC SWOT analyses.	Listening, analysis and evaluation. Perform SWOT analysis for CC/CC scenario.	Formative/iterative. Personal reflection.		
<b>Company Meeting:</b> Discuss and establish your company's structure.	Apply understanding of company structure. Give experience of deciding on appropriate structure for a new venture.	Facilitate as required.	Establish CC company structure. Analyse and evaluate the relevance of chosen structure in relation to your company goals	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Generate personal financial forecast for a year	Familiarise learners with the importance of financial forecasting.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		

## 5.0 Placing a value on your idea

### Session rationale

This session is intended to build upon the previous by examining the function and practice of financial planning as an aspect of business planning. Relevant to the summatively assessed business feasibility study, it is important learners recognise the role of financial planning and profit/loss forecasting as a life skill as well as within venture development. Accounting and awareness of related financial considerations can be one of the most daunting yet necessary aspects of venture development, this session is intended to lay bare aspects of that process.

### Session aims

A student:

- will have an understanding of the commercial value of innovative thinking (and thus the employability value of engendering enterprise/commercialisation awareness)
- should be able to outline (and have simulated experience of) costing processes involved in developing an enterprise or commercialising an innovation
- will understand the function and have experience of constructing a profit/loss forecast and establishing a projected breakeven point for a new venture
- should be able to contextualise costing and forecasting in terms of establishing the feasibility of new ventures.

### Learning outcomes

#### Thematic

CI2, OP1, OP3, OP4, DM1, DM2, DM3, II1, RA1, RA2, IS1, IS3, CS1, CS3, EE1, EE2, EE3, EE4, EE5

#### Competency-based

B1, B3, B5, A2, A4, A5, S2, S4, S5, S6

### Content description

#### **Review:** Generate a personal financial forecast for the coming year

Learners to present their forecasts from previous the follow-up task. Facilitator to highlight areas of personal finance that also appear in business finance (eg. rent, bills), seize on any glaring omissions (eg. rent, living costs) and generally use student examples to draw out and signpost aspects of financial forecasting. Emphasise the fact that personal financial planning is an essential aspect of running a small business (eg. covering your own living costs).

#### **Context:** Placing a value on your idea

This section is intended to build on previous by providing an understanding of financial forecasting within business contexts. Highlight the relevance of financial planning to summative assessment. As such it should provide overviews of financial administration and planning, accounting, business tax, turnover, organisational profit/loss, cash flow, production costing and product/service pricing. If considered relevant, signposting the next two sessions which address Intellectual Property may be of use if only to contrast the notions of financial value and IP value of an idea/venture.

#### **External speaker/Case study:**

This section is intended to consolidate what has been addressed thus far in the course and provide an opportunity to signpost future learning. The speaker or case study should provide learners with real world experience of business start-up and product/service commercialisation. It would be beneficial if they have specific expertise/experience in company structure and/or financial



planning but not essential since anyone with start-up experience will be able to convey some context of these aspects.

**Company Meeting Task: Complete a profit and loss forecast for your company**

This company meeting will require company teams to establish an initial profit/loss forecast for their venture. They will need to identify and assess common business costs as well as those specific to their venture. This is a working document which will be finalised as part of the business feasibility study.

**Follow-up Task: Research and analyse the role of IP in relation to your discipline and its implications for your company's response to the Commercialisation Challenge**

Company teams will consolidate the learning gained from the current session by researching the implications of IP for their discipline/sector and thus their response to the Commercialisation Challenge. Learners may wish to briefly identify real world examples of sector specific or university spinout application of IP rights for future analysis.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Research and analyse successful examples of brand marketing within your company’s business sector	Learners to present evaluation of successful discipline/sector specific marketing strategies.	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues’ content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> Placing a value on your idea	Familiarise learners with components of financial administration and planning. Introduce profit/loss forecasting.	Deliver overview	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>External speaker/Case study:</b>	Consolidate and contextualise learning up to this point.	Facilitate as required.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Complete a profit and loss forecast for your company	Learners to apply understanding of profit/loss forecasting and associated considerations.	Facilitate as required.	Identify and analyse components of company profit/loss forecast. Evaluate accordingly and identify corresponding challenges.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Research and analyse the role of IP in relation to your discipline and its implications for the Commercialisation Challenge	Research IP in relation to discipline and apply findings in context of commercialisation challenge company.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		

## 6.0 The implications of Intellectual Property

### Session rationale

This session will introduce learners to the notion of safeguarding the value of ideas and innovations through Intellectual Property. IP is very often an area that learners will have had little or no previous experience of prior to taking an undergraduate course, yet is an integral aspect of innovation and business venture development. The first of two addressing IP, this session is intended to provide a standalone (non discipline-specific) understanding of the subject. In this session it may be appropriate to highlight the strong relationship between academic research (often addressing identified market needs), Intellectual Property and the application of innovations within the commercial/industrial sector.

### Session aims

A student:

- should be able to explain why safeguarding Intellectual Property is an important aspect of innovation commercialisation and broader business success.
- should be able to identify and differentiate component elements of British intellectual property rights.
- will recognise the benefits of creating a trademark and the ability to copyright.
- will have an awareness of the close associations between academic research, innovation, intellectual property and commercialisation from within the higher education sector.

### Learning outcomes

#### Thematic learning outcomes

CI2, OP1, OP4, DM1, DM2, II1, RA1, RA3, RA4, IS1, IS3, CS1, CS2, CS3, EE1, EE2, EE3, EE4, EE5

#### Competency based learning outcomes

B1, B2, B3, B5, B6, A1, A4, A5, A6, S2, S3, S4, S5, S6

### Content description

**Review:** Research and analyse the role of IP in relation to your discipline and its implications for your company's response to the Commercialisation Challenge

Company teams to present their research findings. Learners to share their research openly with a view to furthering class understanding of discipline/sector specific IP issues. Acknowledgement, recognition and (formative) credit to be given to groups who make important contributions.

#### **Context:** What is IP?

This context section will provide a brief conceptual introduction to IP and its relevance to the commercialisation of innovation. It should: communicate the notion of IP as an asset and revenue source; demonstrate the relevance of IP to innovative ; highlight relevance of IP issues to the Commercialisation Challenge and associated Feasibility Study assessment. The section should be adapted in order to provide a contextual introduction to the following external speaker or case study.

#### **External speaker/Case study:**

This section is intended to provide learners with a standalone understanding of IP issues. It is not required to be contextualised in terms of discipline specific or experiential learning scenario issues as this will be addressed in later learning. It may be relevant and useful to demonstrate the close

## Commercialising Innovation Module

## Session 6: The implications of Intellectual Property

links between higher education research and IP. Examples of possible speakers/case studies include university research and commercial division or the Intellectual Property Office.

### Company Meeting Task: Consider the implications of IP for your company

It is intended that this company meeting section provide an opportunity for class discussion with the external speaker if possible. Ideally it will be a forum for CC teams to raise issues and question the external speaker and in doing so begin to apply their (standalone) understanding of IP to discipline specific contexts and the Commercialisation Challenge. It is therefore an opportunity for company teams to begin considering the implications of IP to their response to the Commercialisation Challenge.

### Follow-up Task: Identify and evaluate an example of IP being used to the advantage of a discipline specific company or university spinout

Company teams will consolidate the learning gained from the current session by researching specific examples of the application of IP from within their discipline/sector or a university spinout. Learners may have begun the process of identifying a case to study in previous follow-up task, this time they are required to provide a more in depth analysis and evaluation of the example they have chosen. They should bear in mind any relevance the example may have for the CC.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Research and analyse the role of IP in relation to your discipline and its implications for your company's response to the Commercialisation Challenge	Learners to highlight the role IP plays within relevant discipline/sector and communicate implications for companies.	Facilitate activity. Respond to content and direct learning as appropriate. Feed relevant points into next section.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> What is IP?	Provide brief context of IP as an important aspect of the commercialisation process. IP as an asset and revenue source.	Deliver overview	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>External speaker/Case study:</b>	Provide a standalone understanding of Intellectual Property. Highlight IP strands: Patents; Trade Marks; Copyright; Design Rights.	Facilitate as required.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Consider the implications of IP for your company	Apply preliminary understanding of IP and the benefits and challenges it confers.	Facilitate as required.	Identify and analyse the potential implications of IP for your company. Evaluate the benefits and challenges.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Identify and evaluate an example of IP being used to the advantage of a discipline specific company or university spinout.	Research, analyse and evaluate an example of the beneficial use of IP by a discipline/sector specific company.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		

## 7.0 Intellectual Property and your business

### Session rationale

The second of the two sessions addressing Intellectual Property, this session aims to consolidate learner understanding of the subject by addressing it in the context of their own discipline/sectors and in doing so highlight the relevance to the product/service Commercialisation Challenge. As such the session focuses on how IP is applied from within a discipline and addresses the practical aspects involved in securing IP rights.

### Session aims

A student:

- should be able to convey an understanding of IP issues and processes specific to their own discipline/sector.
- will have an understanding of IP/patenting intricacies specific to their discipline/sector.
- should be able to describe the reasons and benefits for patenting innovations and the processes involved.
- will have simulated experience of writing a patent claim.
- should be able to identify, analyse and respond to relevant innovation opportunities.

### Learning outcomes

#### Thematic learning outcomes

CI2, OP1, OP3, OP4, DM1, DM2, II1, RA1, RA3, RA4, IS1, IS3, CS1, CS2, CS3, EE1, EE2, EE3, EE4, EE5

#### Competency based learning outcomes

B1, B2, B3, B5, B6, A1, A4, A5, A6, S2, S3, S4, S5, S6

### Content description

**Review:** Identify and evaluate an example of IP being used to the advantage of a discipline specific company or university spinout

Company teams to present their research findings. Learners to share their research openly with a view to furthering class understanding of discipline/sector specific IP issues. Acknowledgement, recognition and (formative) credit to be given to groups who make important contributions.

**Context:** IP and your discipline

Reviews to be consolidated by a tutor presentation and class discussion which should: develop points raised in reviews; emphasise any discipline/sector specific issues; highlight the procedures and processes involved in filing an IP claim. If possible the discussion should provide context for the following external speaker/case study.

**External speaker/Case study:**

This section is intended to provide learners with either an experiential account of IP within the relevant discipline/sector or a more in depth view of related IP processes. Examples of possible speakers/case studies could include an individual or organisation that has had first hand experience of filing an IP claim as part of a commercialisation, ideally from within the relevant sector; alternatively a professional employed within the IP profession who can convey an aspect of claim filing in detail, for example the authoring of a patent claim.

**Company Meeting Task:** Write an intellectual property claim for requisite aspect(s) of your commercialisation

## Commercialising Innovation Module

## Session 7: Intellectual property and your business

Where possible this task should apply the knowledge gained in the previous sections. Learners are to construct an IP claim (using a recognised claim format) for any relevant aspects of the product/service or they are commercialising as part of the CC. This will be a patent, trademark or copyright claim of some sort. The claim is not expected to be of professional standards, rather the exercise is intended to see learners engaging in the process albeit briefly! Should those interested wish to take they exercise further, they can be signposted/supported as appropriate.

### Follow-up Task: Research potential customer markets and examples of competitor response

This follow-up task is intended to give learners a preliminary understanding of the importance of market research, customer focus and the associated identification of customer/industry needs. Using the CC as a context, learners should consider *who* their likely customers are and what needs they have. They should also consider at least one example of a possible competitor and how they have sort to address issues of customer focus.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Identify and evaluate an example of IP being used to the advantage of a discipline specific company or university spinout	Present overview of identified example of IP being used to the advantage of a discipline/sector specific company.	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> IP claims and your discipline	Familiarise learners with the procedures involved in establishing IP. Examine relevant process of filing an IP claim.	Consolidate and further focus learning. Reiterate key points and raise any missed. Facilitate discussion.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>External speaker/Case study:</b>	Provide a discipline specific understanding of Intellectual Property. Highlight how IP is applied and enacted.	Facilitate as required.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Write an intellectual property claim for requisite aspect(s) of your commercialisation.	Apply understanding of IP to CC and construct a relevant IP claim.	Facilitate as required.	Discuss, analyse and generate a brief IP claim for a relevant aspect of your company/product/service.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Research potential customer markets and examples of competitor response.	Familiarise learners with concepts of customer focus and customer needs. Consideration of competitor response to such market research.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		



## 8.0 Differentiation in the market place

### Session rationale

This is the first of two sessions which will address issues of taking an innovation to market. This session is intended to provide learners with an understanding of the preliminary steps taken in order to establish the viability of a product or service within the market place and how it can be differentiated. The ability to spot gaps in the market and exploit the opportunities they present is a defining entrepreneurial skill. The capacity to identify the needs of customers and markets (through market research) and respond to them accordingly is an important attribute of enterprising behaviour. The activities which learners undertake in this session will provide continued context for those carried out in the next session, ultimately resulting in the establishment of an informed marketing strategy for the Company teams as part of the Commercialisation Challenge. As such the signposting of future learning is of significant value in terms of building learning context.

### Session aims

A student:

- should be able to identify target markets and associated value mechanisms.
- will recognise the importance of responding to market/purchaser needs and engendering positive customer relations
- should be discerning with regards to the fact that customers may not always be the end consumer
- should be able to explain what is needed to differentiate a product or service.
- will recognise the importance (and have simulated experience) of strategic competitor analysis within the sector specific marketplace.

### Learning outcomes

#### Thematic

CI1, CI2, OP1, OP2, OP3, OP4, DM1, DM2, DM3, II1, RA1, RA4, IS1, IS2, IS3, CS1, CS3, EE1, EE2, EE5

#### Competency-based

B1, B2, B5, B6, A1, A3, A4, A5, A6, S1, S2, S4, S5, S6

### Content description

#### **Review:** Research potential customer markets and examples of competitor response

Company teams to present their research findings. Content should demonstrate recognition of strategic value of findings. Where appropriate tutor should develop/signpost points made by learners with regards to next section content.

#### **Context:** Differentiation in the marketplace – identifying your market

Reviews to be used to lead into key points considered within this section. The section will provide a brief overview of a range of elements involved in identifying and responding to a market for a product or service. Learners will engage with the following concepts: market research (identifying customer or industry needs), customer focus, differentiation and the identification of a Unique Selling Point. It may also be worth reviewing opportunity recognition (initially covered in session 3). Where relevant highlight: market research as being evidence based research; the role of 'customer need' as a driver of both commerce *and* academic research and its application. As appropriate use content/discussion to give context to following speaker/case study.

**External speaker/Case study:**

This section is intended to provide learners with a real world example of someone who has been closely involved in marketing a product/service, ideally within a relevant sector. Examples might include a market research specialist or an entrepreneur/professional who has experience of taking a relevant product/service to market.

**Company Meeting Task: Consider differentiation in the market place**

Learners to apply prior learning gained in previous follow-up task and this session to establish the following: who their intended customer is and what needs they have; who their likely customers are; preliminary strategies their company might employ to differentiate their product/service within the market place.

**Follow-up Task: Research and analyse successful examples of brand marketing within your company's business sector**

This follow-up task is intended to link the content covered in this session with that of the next. Having established who their customers and competitors are, learners should identify and research an example of a successful branding and marketing strategy (ideally that of a competitor within the relevant industry sector).

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Research potential customer markets and examples of competitor response	Communicate overview of potential markets	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> Innovation in the marketplace – identifying your market	Familiarise learners with key concepts of market research, customer focus, differentiation and USPs.	Deliver overview. Facilitate class discussion	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>External speaker/Case study:</b>	Provide learners with a first hand account of taking an innovation to market. Opportunity for learners to question and contextualise learning.	Facilitate as required.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Consider innovation in the market place.	Learners to apply concepts of market research, customer focus, differentiation and USPs within context of CC.	Facilitate as required.	Discuss, analyse and evaluate relevant information. Generate preliminary differentiation strategies.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Research and analyse successful examples of brand marketing within your company's business sector	Learners to identify, analyse and evaluate examples of successful branding and marketing strategy.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		

## 9.0 Marketing and the importance of brands

### Session rationale

This is the second of two sessions which will address issues of taking an innovation to market. Building upon the previous session which examined the processes involved in establishing market viability for a product/service, this session examines ways of utilising that knowledge to target potential customers, establishing a brand and market goods or services. In particular learners will examine means of creating a product identity and establishing customer loyalty through it. The session will also examine a range of contemporary market strategies and paradigms and ask learners how they can apply these ideas to their own commercialisation project. The activities engaged in during this session are an extension of those carried out in the previous, culminating in company teams establishing a defined branding and marketing strategy.

### Session aims

A student:

- should be able to convey an understanding the difference between marketing and branding.
- will have understanding of how branding can influence market/customer opinions.
- should be able distinguish and strategically evaluate methods of marketing appropriate to their industry sector.
- should be able to identify and respond to the needs of customers and where relevant other stakeholders.
- should recognise the importance and be able to demonstrate adaptability in response to alternative perspectives and changing markets.

### Learning outcomes

#### Thematic

CI1, CI2, OP1, OP2, OP3, OP4, DM1, DM2, DM3, II1, RA1, RA2, RA3, RA4, IS1, IS2, IS3, CS1, CS3, EE1, EE2, EE5

#### Competency-based

B1, B2, B5, B6, A1, A3, A4, A5, A6, S1, S2, S4, S5, S6

### Content description

**Review:** Research and analyse successful examples of brand marketing within your company's business sector

Company teams to present their research findings. Content should display appropriate analysis of identified examples demonstrating prior learning of previous session. Where appropriate tutor should develop/signpost points made by learners with regards to next section content.

**Context:** The role of branding

Reviews to be used to lead into key points considered within this section. The section will provide an overview of the difference between marketing and branding and will also build on prior learning regarding customer focus by considering how branding can influence customer opinion.

**Company Meeting Task:** Discuss potential branding strategies for your company's product.

Learners are to apply knowledge of market research, differentiation, branding and marketing strategies in order to begin constructing their own branding strategy for their CC product/service.

## Commercialising Innovation Module

## Session 9: Marketing and the importance of brands

Students should consider how possible branding might be aligned with their findings regarding potential customers and used to distinguish their brand from that of possible competitors.

### Context: The importance of marketing strategy

This section should build upon previous sessions learning by communicating how marketing strategies build upon market research, customer focus, differentiation and USPs. It should give brief overviews of well known marketing strategies for example the 5Ps of a marketing mix. In addition this section should briefly consider the role of 'selling' and its component skills in commercialisation.

### Company Meeting Task: Discuss potential marketing strategies for your company's product.

Learners are to fully apply the range of concepts they have covered in past two sessions by generating a definitive marketing strategy for their product/service. They can continue the work begun in previous Company Meeting Task by further developing their brand in line with their marketing strategy. Students should consider how possible marketing strategies might be aligned with their findings regarding potential customer and used to differentiate their product/service from that of possible competitors.

### Follow-up Task: Identify and evaluate a presentation or pitch

This task can be approached in one of two ways, learners can be given an appropriate pitch or presentation to analyse or alternatively asked to identify their own. Learners to analyse and evaluate a product/service/organisational pitch or presentation. Where possible the presentation should be from within relevant discipline/sector, although this will not always be possible. Learners to analyse and evaluate the pitch or presentation, identifying key strengths and weaknesses.

Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Research and analyse successful examples of brand marketing within your company’s business sector	Present research findings. Communicate.	Facilitate activity. Respond to content and direct learning as appropriate.	Deliver and contextualise research. Listen and contextualise colleagues’ content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> The role of branding	Highlight the importance of establishing brand identity and the role it can play in influencing customers.	Deliver overview and facilitate class discussion.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Discuss potential branding strategies for your company’s product.	Apply knowledge of branding in order to construct a branding strategy for their commercialisation.	Facilitate as required.	Identify, apply and evaluate a possible a branding strategy for their CC product or service.	Formative/iterative. Personal reflection – log learning and development.		
<b>Context:</b> The importance of marketing strategy	Familiarise learners with key aspects of marketing.	Deliver overview and facilitate class discussion.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Company Meeting Task:</b> Discuss potential marketing strategies for your company’s product.	Apply knowledge of market research and marketing in order to construct a marketing strategy for their commercialisation.	Facilitate as required.	Identify, apply and evaluate a possible a marketing strategy for their CC product or service.	Formative/iterative. Personal reflection – log learning and development.		
<b>Follow-up Task:</b> Identify and evaluate a presentation or pitch	Learners to research and identify strengths and weaknesses of a pitch or presentation.	Direct intended learning.	Research, analysis, synthesis and evaluation. Apply research in context of CC and personal development.	Formative/iterative. Personal reflection.		

## 10.0 Pitching and presenting

### Session rationale

This session is intended to provide learners with a greater understanding of what makes a good presentation or pitch. The benefits of this session are two-fold: firstly to aid students in their assessed course presentation in which they are required to pitch their commercialisation and secondly to develop a deeper understanding of the importance and value of presentational skills as a key employability/professional/business skill. The session should communicate the notion of differing presentation types for different intended outcomes and how content can be adapted or developed to suit different purposes and audiences.

### Session aims

A student:

- will recognise the professional and business value that strong presentational skills confer from both individual and organisational perspectives
- will have experience of analysing and evaluating business pitches
- should recognise the importance and be able to communicate enthusiasm to 'sell' new ideas, concepts or solutions.
- interact with others in order to 'close the deal' and build trust for long-term relationships

### Learning outcomes

#### Thematic

CI1, CI1, OP2, OP3, OP4, DM1, DM2, DM3, I11, RA1, RA2, RA3, IS1, IS2, IS3, CS1, CS2, CS3, EE1, EE2, EE3, EE4, EE5

#### Competency-based

B2, B3, B4, B5, B6, A2, A4, A5, A6, S1, S2, S4, S5, S6

### Content description

#### **Review:** Identify and evaluate a presentation or pitch

Selected learners to deliver brief evaluations of chosen pitch or presentation. Use as platform to generate a list of general presentational strengths and weaknesses. Facilitate class discussion regarding the chosen pitches and presentations

#### **Context:** Pitching and presentation

Facilitator to build upon prior section. Consolidate learning by briefly examining differing contexts and purposes a presentation may be delivered in eg. education assessment, information/research transmission, pitching yourself at interview, pitching a product/service, pitching for investment. Consider factors that may influence presentational content and approach eg. timing, audience, IT facilities.

#### **Activity:** Watch and analyse examples of pitches from BBC Dragon's Den

This activity is designed to focus on pitching business ideas. It should incorporate and develop prior learning. The group as a whole is to watch examples of good and bad pitches made on Dragon's Den. This is an opportunity to apply and further develop the list of pitching and presentation strengths and weaknesses. Class discussion to be facilitated.

#### **Company Meeting Task:** Plan your company presentation

**Commercialising Innovation Module**

## Session 10: Pitching and presenting

Company teams to spend time developing their presentation. Learners should be seeking to implement many of the strengths and avoid the weaknesses identified within the session. If the teams are presenting a sales pitch they should be aiming to incorporate and communicate many of the elements covered in the marketing sessions. If they are presenting the feasibility plan they should be seeking to cover a range of aspects covered within the course which feed into the feasibility plan.



Timetable

Content	Aims/objectives	Tutor activities	Student activities	Assessment	Resources	Time
<b>Review:</b> Identify and evaluate a presentation or pitch	Learners to communicate their analysis and evaluation regarding strengths and weaknesses of a pitch or presentation.	Facilitate activity. Respond to content and direct learning as appropriate. Compile list of strengths and weaknesses.	Deliver and contextualise research. Listen and contextualise colleagues' content.	Formative/iterative. Personal reflection.	IT equipment.	
<b>Context:</b> Pitching and presentation	Provide an overview of the professional relevance of presentational skills. Examine types of presentation and their associated objectives.	Deliver overview, facilitate continued class discussion. Add to list of strengths and weaknesses.	Listening, analysis and evaluation – personal contextualisation and reflection.	Formative/iterative. Personal reflection.		
<b>Activity:</b> Watch and analyse examples of pitches from BBC Dragon's Den	Provide learners with an opportunity to apply the strengths and weaknesses list. Analysis and evaluation of pitches.	Facilitate discussion. Direct learning.	Analysis and evaluation – personal contextualisation and reflection.	Formative.	Dragon's Den media files.	
<b>Company Meeting Task:</b>	Students to apply prior learning in context of CC.	Facilitate as required.	Develop content for assessed presentation.	Formative/iterative. Personal reflection – log learning and development. Preparation for assessed presentation.		

## Commercialising Innovation Module

### Appendix A – Exemplar module descriptor

The following descriptor was created for the Cardiff School of Engineering 3<sup>rd</sup> year undergraduate optional module EN3006: Commercialising Innovation which ran in academic year 2011 – 2012.

Credits: 10

Semester: Autumn

Contact time: 24 hours (grouped into 12 two hour sessions)

Learning environment: Flat open plan seminar room

#### Outline

- Introduction to innovation and enterprise
- Company structures
- Evaluating ideas and innovation
- Understanding your market competitors and customers
- Marketing and the importance of brands
- Intellectual Property – patents, registered designs and trademarks
- Business planning
- Presenting an idea

#### Module Summary

This module provides an opportunity to work within a team to develop, plan and evaluate an idea for a new emerging engineering based business. Emphasis is placed on the development of commercial awareness skills, analysis of new ideas, presentation, report writing and the relationship between innovation and commercial exploitation.

The module will take the form of lectures, seminars and structured 'company' meetings. Within the context of being 'an innovative engineering based small firm', each group will be supported through the challenges and stages of commercialising an engineering project. Drawing on the support of guest lecturers and industry professionals, students will gain exposure to real life examples for learning. Assessment will be via their personal contribution to team tasks, a group business plan and formal presentation.

This module is designed to enhance student employability and enterprise skills in line with the University's Employability and Enterprise Strategy. No prior knowledge of business is assumed.

#### Aim

Develop an understanding of the commercialisation process in engineering innovation.

#### Objectives

- Describe the process of commercialisation for a new engineering innovation
- Identify a relevant company structure and offer reasoning for its use
- Outline the intellectual property considerations when establishing a new commercial entity
- Undertake research and market analysis for a new engineering innovation
- Evaluate opportunities for a new engineering innovation
- Reflect on one's own ability to contribute effectively to group activities and manage own time and resources in working towards group goals.
- Construct and present an outline business plan for the commercialisation of a new engineering innovation

#### Assessment

60% Group feasibility study / business plan

25% Group presentation

15% Personal contribution

## Appendix B – Exemplar of discipline adapted Commercialisation Challenge descriptor

### THE 'APP' CHALLENGE

Upon graduation you decide to establish an innovative new company to create a new smartphone or tablet *App*. Within your 'company' team you must develop, plan and evaluate the idea of commercialising an *App*. You must decide upon the type of *App* your company wishes to create and look to exploit the growing market for such electronic engineering.

**You will be assessed on your ability to:**

- Construct an outline business plan for the commercialisation of the *App*
- Present your ideas to a board of potential investors

**During the course of the task you will need to:**

- Identify a relevant company structure and offer reasoning for its use
- Outline the intellectual property considerations when establishing a new commercial entity
- Undertake research and market analysis for your proposed business idea
- Evaluate opportunities (and threats) for your proposed business
- Reflect on one's own ability to contribute effectively to group activities and manage own time and resources in working towards group goals

**Areas you may also like to consider:**

- Who the *App* is aimed at
- Who will create it and how would be developed
- Do you need to obtain any licences
- How it will generate revenue
- How much finance you would need to develop and commercialise it
- Outlining what the difference is between the terms 'profit' and 'turnover', then highlighting your expected forecasts for each

Your team may develop its own *App*, but your focus should be on the process of commercialisation rather than product development. Any research presented can be either primary or secondary.

## Commercialising Innovation Module

### Appendix C – Suggested reading for learners

Beaver, G. 2002. *Small business, entrepreneurship and enterprise development*. Harlow: FT Prentice Hall.

Bessant, J. and Tidd, J. 2007. *Innovation and entrepreneurship*. Chichester: Wiley.

Bridge, S. O'Neill, K. and Cromie, S. 2008. *Understanding enterprise, entrepreneurship and small business. 3<sup>rd</sup> Edition*. Basingstoke: Palgrave Macmillan.

Burns, P. 2011. *Entrepreneurship and small business. 3<sup>rd</sup> Edition*. Basingstoke: Palgrave Macmillan.

Burns, P. 2008. *Corporate entrepreneurship. 2<sup>nd</sup> Edition*. Basingstoke: Palgrave Macmillan.

Carter, S. and Jones-Evans, D. 2006. *Enterprise and small business. Principles, practice and policy. 2<sup>nd</sup> Edition*. Harlow: FT Prentice Hall.

Rae, D. 2007. *Entrepreneurship from opportunity to action*. Basingstoke: Palgrave Macmillan.

Westhead, P., Wright, M. and McElwee, G. 2011. *Entrepreneurship: Perspectives and cases*. Harlow, Essex: Pearson Education

### Appendix D – Suggested reading for facilitators

Handscombe, R. D., Rodriguez-Falcon, E. & Patterson, E. A. 2008. "Embedding enterprise in science and engineering departments". *Education + Training*. 50:7, pp. 615-625

Jones, C. 2011. *Teaching Entrepreneurship to Undergraduates*. Cheltenham: Edward Elgar Publishing

Pittaway, L. 2009. "The role of inquiry-based learning in entrepreneurship education". *Industry and Higher Education*. 23:3, pp. 153-162

Pittaway, L. & Cope, J. 2007. "Simulating Entrepreneurial Learning: Integrating Experiential and Collaborative Approaches to Learning". *Management Learning*. 38:2, pp. 211-233.

Pittaway, L., Hannon, P., Gibb, A. & Thompson, J. 2009. "Assessment practice in enterprise education". *Entrepreneurial Behaviour & Research*. 15:1, pp. 71-93

QAA. 2012. *Enterprise and entrepreneurship education – Guidance for UK Higher Education providers – Draft for consultation*. Quality Assurance Agency for Higher Education. Available: [http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/EE\\_Draft\\_Guidance.pdf](http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/EE_Draft_Guidance.pdf)  
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