

EXPERIENTIAL LEARNING AND THE USE
OF BUSINESS SIMULATIONS AND TEACHING CASES

an **Integrated** **Learning Approach**

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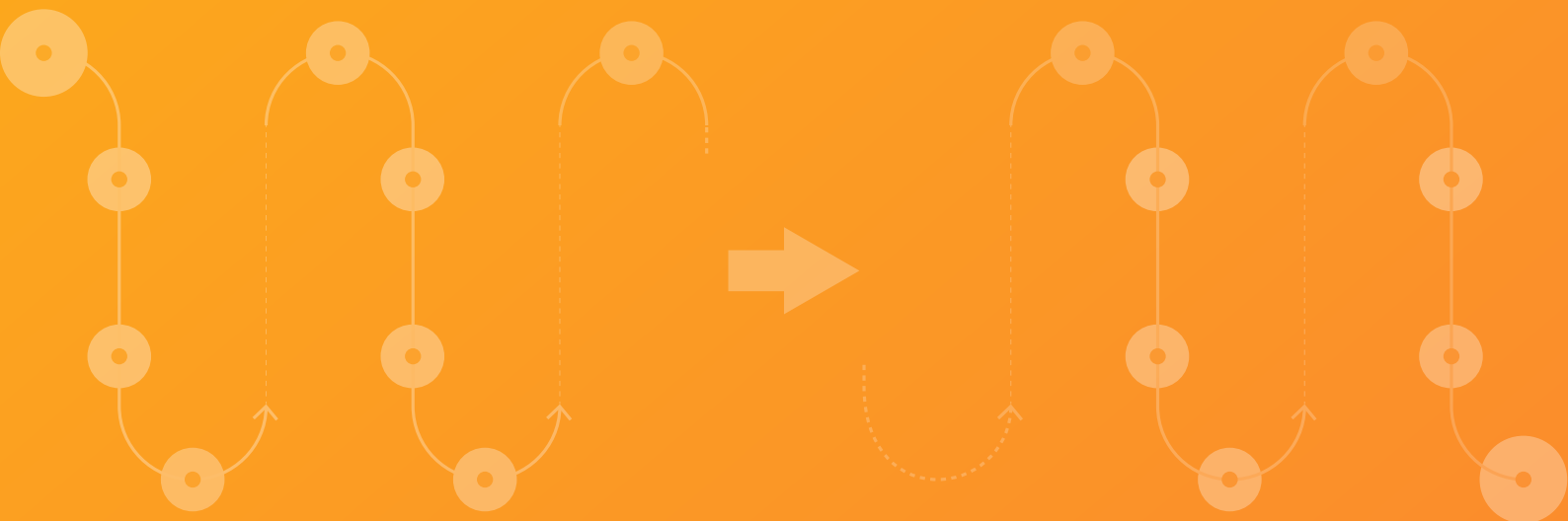


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“Many students learn best when they are actively doing things and not only studying ideas in the abstract: when their curiosity is aroused, when they are asking questions, discovering new ideas, and feeling for themselves the excitement of these disciplines.” – Ken Robinson & Lou Aronica (2015)

Introduction

The phrase above by the late great Ken Robinson and his co-author Lou Aronica opens the Prefaces of my latest two books, *Mastering the Supply Chain (2019)* and *Mastering the Circular Economy (2021)*¹. As is common with epigraphs, the phrase can be seen as a declaration of intentions. It sets the scene for what is to come and indeed, both books were written parting from the general idea of facilitating students to ‘actively do things’, to offer an Integrated Learning Approach that links conceptual frameworks from theory to the understanding and development of relevant skills, leveraging the power of using business simulations, all captured in a textbook to be used as the backbone in a course or training.

The proposed Integrated Learning Approach builds on the principles of **experiential learning**², which provides the main methodological foundation and this brings me to a second phrase, cited further on in the aforementioned Prefaces, in which **Kolb’s Learning Cycle of experiential learning** is introduced as a key reference:

“

[...] knowledge results from the combination of grasping and transforming experience. Grasping experience refers to the process of taking in information, and transforming experience is how individuals interpret and act on that information.
[...] This process is portrayed as an idealized learning cycle or spiral where the learner touches all the bases’

– Kolb, 2015

Kolb generalizes the applicability of this experiential learning cycle to all learning in all stages of one’s life. Although I tend to believe that this is very true, in this whitepaper I would particularly like to narrow the scope and zoom in on the application of the principles of experiential learning from the very specific angle which is captured in aforementioned two books: an Integrated Learning Approach developed for courses and trainings on Supply Chain Management and on Circular Economy, applied in Higher Education and with an important role for business simulations.

I will first briefly touch upon Kolb’s main foundations of experiential learning as the conceptual backbone of the Integrated Learning Approach, which then leads to a more detailed look into different elements of the Integrated Learning Approach as it has been developed. I then close with linking the Integrated Learning Approach explicitly back to Kolb’s main foundations.

^[1] Mastering the Circular Economy has been co-written with Rozanne Henzen.

^[2] In the blogpost ‘*Mastering the Supply Chain. Why experiential learning is crucial*’ I have addressed the main reasons why I believe that experiential learning is a very appropriate way for learning about Supply Chain Management (<https://www.koganpage.com/article/mastering-the-supply-chain-with-experiential-learning>). The book Mastering the Circular Economy is from a later date, but I do believe that the points made in the blogpost are also valid for the topic of circularity.

The foundation: Kolb's concepts of experiential learning³

David Kolb himself is the first one to acknowledge that he is not the inventor of experiential learning and that he is also building on the work of many others, alluding in his book to Newton's famous '*standing on the shoulders of others*'⁴. In any case, I think it is fair to say that Kolb can be considered to be one of the major driving forces behind the conceptualization and knowledge development in the field of experiential learning.

For the purpose of this whitepaper, I would like to highlight **four conceptual cornerstones** from Kolb's work, relevant to the Integrated Learning Approach and the role of the educator in it. The four cornerstones are:

1. THE **LEARNING CYCLE**
2. THE CONCEPTS OF **LEARNING STYLES AND LEARNING FLEXIBILITY**
3. THE CONCEPT OF **TEAM LEARNING**
4. THE ACCOMPANYING **EDUCATOR ROLES**

It's fair to comment that in the following sections I cannot enter into the many nuances and refinements of the theoretical basis of all of Kolb's concepts and that I will limit myself to the main conceptual outlines required for understanding the Integrated Learning Approach. Please see **Annex 1** for a more detailed overview of Kolb's foundational concepts.



^[3] Kolb's seminal book on Experiential Learning is the main source and inspiration here (second edition 2015, see full reference at the end of the paper). In addition, there are two later publications of Kolb and Peterson (Peterson and Kolb, 2017 and Kolb and Peterson, 2019) that have been used here.

^[4] On the website <https://learningfromexperience.com>, a number of video's as well as other resources can be found. These include attention for some of the 'giants' preceding Kolb as well as cover the basics of experiential learning as addressed in this whitepaper: the learning cycle, learning styles and educator roles.

Integrated Learning Approach (aka Ed's Principles)⁵

The first steps

As a freelance professional, I have been teaching since the mid 00's in a wide variety of Business Schools around the world, mostly in the Operations & Supply Chain Management area, later on also in Project Management, Entrepreneurship and the most recent addition has been the Circular Economy. Methodologically speaking, the business school where I started my teaching journey was pretty much focused on experiential learning through Harvard-style teaching cases. Obviously, this has shaped my perspective as an educator by observing how stimulating learning can be for students if the educator asks questions that facilitate discussion and interaction, rather than him or her dedicating themselves mainly to explaining theory. Over time, looking to bring a bit more methodological diversity into the classroom, I expanded

my methodological repertoire by adding team assignments and projects, field research and, quite importantly, business simulations.

Towards a more holistic view

In parallel, I developed a view on what for me could be the definition of an Integrated Learning Approach. First of all, I have formulated the following generic goals which, if possible, I would like to achieve through any course I design. They represent the benefits of a course from the perspective of the learning and as such, they provide **the guidelines for defining the specific learning objectives for a specific course:**

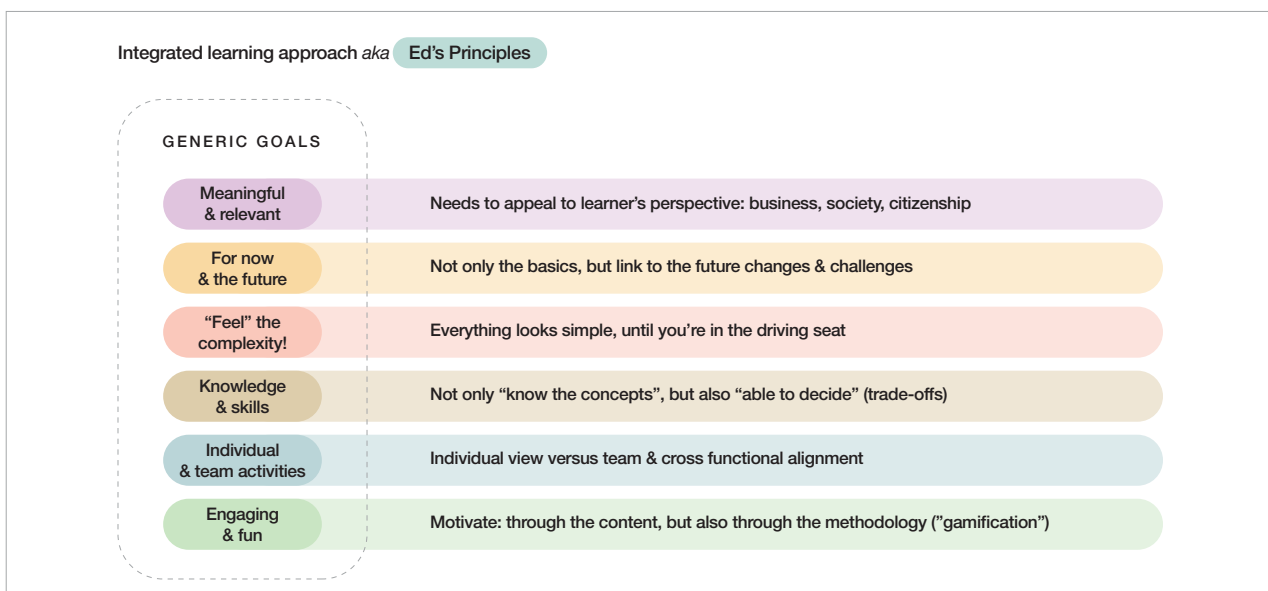


Figure 1: Generic goals for a course based on the Integrated Learning Approach

^[5] As a frequent user of Inchange's business simulations in my own courses and as a frequent collaborator giving support to other educators using their simulations, the people at Inchange have dubbed my views on what the Integrated Learning Approach could look like as "Ed's Principles", hence the 'aka' in the title of this section.

With these guidelines as a starting point, over time the complete picture of the Integrated Learning Approach has evolved, adding the content building blocks, aspects of course design and, of course, the learners in question:

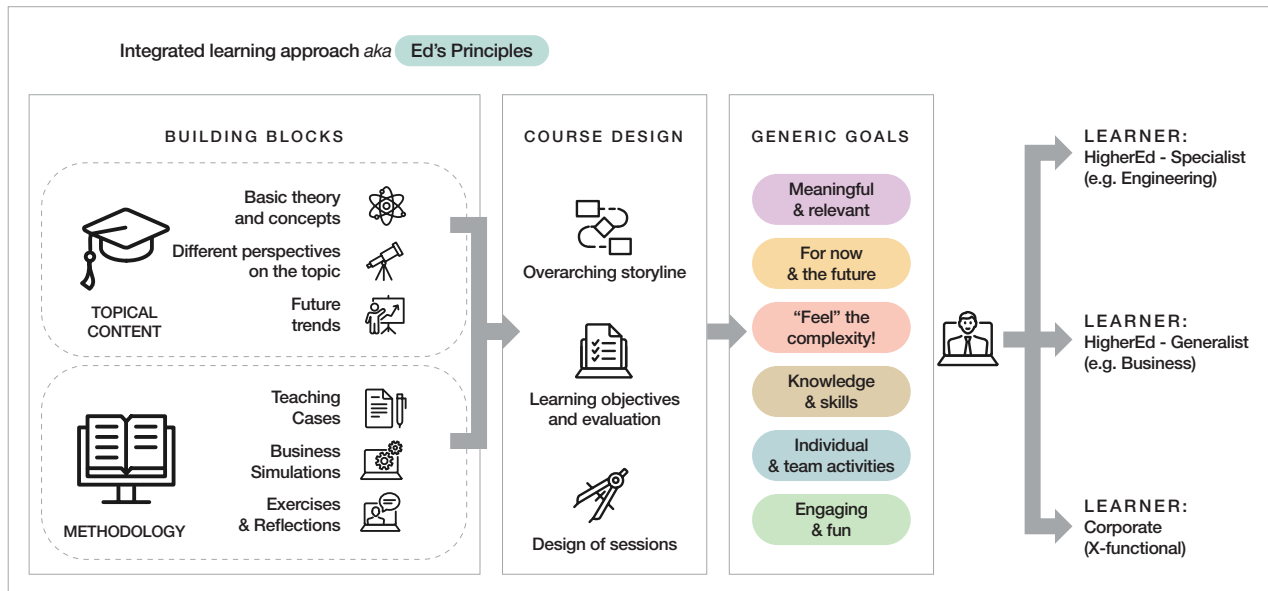


Figure 2: The Integrated Learning Approach: learners, generic goals, building blocks and course design

In the following section, I will zoom in on each of the elements of the Integrated Learning Approach.

Practical application of the Integrated Learning Approach: designing a course

With the framework of Figure 2 as starting point, designing a specific course at the most practical level typically implies the development of a course manual or syllabus in which the approach needs to be converted into very tangible and practical aspects of a course.

Building blocks: topical content and methodology

Topical content and methodologies are the main pieces of the puzzle to play with when designing a course. Where the topical content is often reduced to its most visible representation, namely the corresponding basic theories and concepts, I typically also look for different angles on the topic. For example, in courses about Supply Chain Management, I would not only address the more 'technical' aspects like sourcing, production and distribution, but also zoom in on the 'business dimension' of the topic, as well as the 'leadership' dimension, thus broadening and enriching the scope. In addition, I would

always intend to include an outlook into future trends, so that learners not only see and experience current-day practice, but can also start envisioning potential future applications.

In addition to the theoretical part of courses, in terms of the methodologies as applied in Higher Education, I normally work with a combination of assignments and exercises, projects, field research, teaching cases and business simulations. Since business simulations are still a relatively novel methodology for many educators, I would like to elaborate a bit more on those in **Box 1**. Please see **Annex 2** for a more detailed elaboration of the other methodologies as mentioned in Figure 2.

ABOUT THE USE OF BUSINESS SIMULATIONS IN EDUCATION

Business simulations have actually been around for a long time already, for example in the form of educational board games. With the ongoing development of more and more sophisticated technology, nowadays most simulations are built on digital platforms. Whereas teaching cases facilitate scenario development on the basis of much data about content as well as context, and in-depth discussion and interaction and confrontation of ideas and viewpoints, business simulations typically focus a bit more on content. However, at the 'expense' of this slightly more narrow scope, simulations allow for more deep and extended experience of seeing the results of one's actions, in other words gain a better understanding of cause-and-effect, even allowing for a certain degree of trial and error, something which is practically impossible when using cases. This is for me one of the most important parts of added value of using simulations, particularly when used as complementary to cases.

Furthermore, business simulations are really helpful in bringing theory into practice, to demonstrate the 'simple but not easy' aspect of many conceptual frameworks: they sound simple when explained, but will still have many complexities when applied. Lastly, in addition to the above, business simulations are a great vehicle for provoking team collaboration and aligned decision making, as well as subsequent reflection on team performance and dynamics.

SELECTION CRITERIA WHEN CHOOSING A BUSINESS SIMULATION

When looking for suitable business simulations for use in my own courses, I formulated the following selection criteria. The business simulation should:

- *Address relevant topics*, from the perspective of directly linking to the core topics and learning objectives of the specific course it's intended for;
- *Reflect real-life complexity*, both in terms of complexity of the 'technical' content related to the course topics and in terms of organizational complexity (structure, functional roles) and organizational dynamics (trade-offs, alignment between departments);
- *Be doable in the available timeframe of the course*, in a way that it does provide the required 'concrete experience', but doesn't become too dominant in terms of the time dedicated to the simulation in class versus the total available contact hours.
- *Have an intuitive user interface*, and preferably no need for an extensive simulation user manual or, alternatively have more playful ways of getting to know the simulation;

Over time, I have noticed that there are two more criteria which come in as very useful:

- Does the simulation offer a basis for competition? Some people refer to this as the 'gamification' element. I will briefly come back to this a bit further on in this paper in the section on grading and evaluation.
- Does the simulation come with complementary supporting materials, such as background information for educators, supporting presentation materials and exercises, as well as fast and effective technical and content-driven support?

Overarching storyline: gluing it all together within a course or training

A well-designed course would already be strong and coherent because of the well-chosen content and methodologies. Still, I would always look for an overarching story to connect all of the individual (sub-)topics to be addressed in the course. In fact, I would argue to always start course design with the definition of such an overarching storyline.

For the purpose, I first of all look for or create an image which reflects the entire content in some way or another. In addition, I try to define short and somehow 'catchy' phrases or statements which can serve as the backbone for the stories I want to tell in the course. I would then make sure to have these phrases or statements, as well as the images appear continuously throughout the course. On the one hand, this serves as a roadmap for the course, thus providing insight at all times where on the journey the learners and the educator are. On the other hand, the chosen storyline and catchphrase(s) transmit the central message, serving to creating one coherent integral topical whole and have them remember the 'backbone' much better.

Learning objectives and evaluation

LEARNING OBJECTIVES

Another important step is to develop the specific learning objectives of a course: what exactly do I want the learners to acquire in terms of knowledge and skills? Nowadays, educators are asked more and more to use either Bloom's Taxonomy and/or the Dublin Descriptors as frameworks for specifying the learning objectives and their corresponding rubrics (see **Annex 3** for a brief overview). Although learning objectives should ideally speaking be straightforward and connected to the topic and the educational level, in practice a number of important trade-offs does exist, for example between:

- Audience and academic level (business, engineering, 1st year, ExecEdu, ...)?
- Program (minor in circularity, elective in MBA, ...)?

- Number of classes and hours (10 sessions of 45 mins, 8 x 4 hours, ...)?
- Duration (intensive course in 3 days, course over 10-week span, ...)?
- Platform (100% in-class, 100% online, hybrid, blended, ...)?

This then leads to the definition of specific objectives, which in turn form the basis for the further design of course content & the choice for specific learning methodologies.

EVALUATION: GRADING OF ACTIVITIES

Obviously, the first input for deciding on how to go about grading are the specific learning objectives as defined for the course. These then lead to the question as to how best to evaluate learner performance. What I tend to do is to also include a number of the reflections and team activities into the grading, for example as carried out between rounds of gameplay of the simulation. A question often asked to me by fellow educators is related to the use of the simulation's game results or rankings in the grading of a course. I'm not much in favor of doing this. Over time, my experience in using business simulations has led me to the conclusion that results obtained in gameplay (for example expressed by the profitability of the virtual company the learners are in charge of) are not a very reliable indicator for the amount of learning that has taken place. Principally, the simulation is an important vehicle for the necessary step of undergoing a concrete experience (CE) in the learning cycle. Therefore, in grading I would recommend to prioritize reflections and application of the findings in exercises in grading. There, as an educator, you can also see to what extent the learnings have really been internalized by the student in question, since they're then obliged to elaborate and explain things in their own words, rather than through buttons on a screen.

Does that mean that business simulation game results are irrelevant or useless? No, not at all! Because these results are part of the gamification aspect of using simulations, they work as a very strong motivator, since in the end learners and their team mates want to win the competition they're part of. This competitive element turns out to be a strong driver of engagement, which can complement the engagement students may (or sometimes may not so much) have for the content of the course.

Design of sessions: choice of topics, methodologies and sequence of activities

Once the learning objectives have been defined and the overarching storyline is clear, the specific topics can be assigned to the available sessions and the methodologies can be selected. In many of my courses I work with rather generalist audiences from a wide diversity of professional and cultural backgrounds, so typically I would choose to ask participants to study the main basic theoretical frameworks before coming to the first session, on the basis of articles, a textbook and/or some instructional videos. This would at least get everyone up to a certain level of understanding of the topic of the course before kicking off the first session.

Then in the first sessions, I would ideally choose to work on teaching cases and start preparing for the use of a business simulation by means of a practical (team) exercise. Such an exercise would ideally meet a number of **different objectives**: practice one or more specific techniques relevant to the course topic, make an assessment of the initial situation of the problem at hand in the business simulation and potentially already define first ideas about what to change once the simulation starts and get to know the content of the simulation without having to study a detailed user manual.

After this, the simulation can start, in which in a number of iterations the same sequence is followed:

- Play a round of the simulation, i.e. *implement decisions*;
- *Reflect* on the round of gameplay, i.e. what happened and why?
- *Link* to theory and conceptual frameworks, either theory that was dealt with already, or by bringing in new concepts;
- *Analyze* the situation in the business simulation by taking into account the learnings from the reflections and the additional theory.

It's important to highlight a few things that were already mentioned before:

- First of all, as can be seen in **Figure 3**, the sequence of activities follows the steps of the learning cycle;
- Secondly, a mix of methodologies is applied, thus addressing the different learning styles and facilitating increased skill towards learning flexibility;
- Thirdly, it can be observed that the simulation is 'only' part of the course, it's not the whole course. The simulation provides the basis for grasping concrete experience, which is then further exploited following the other three steps of the learning cycle.

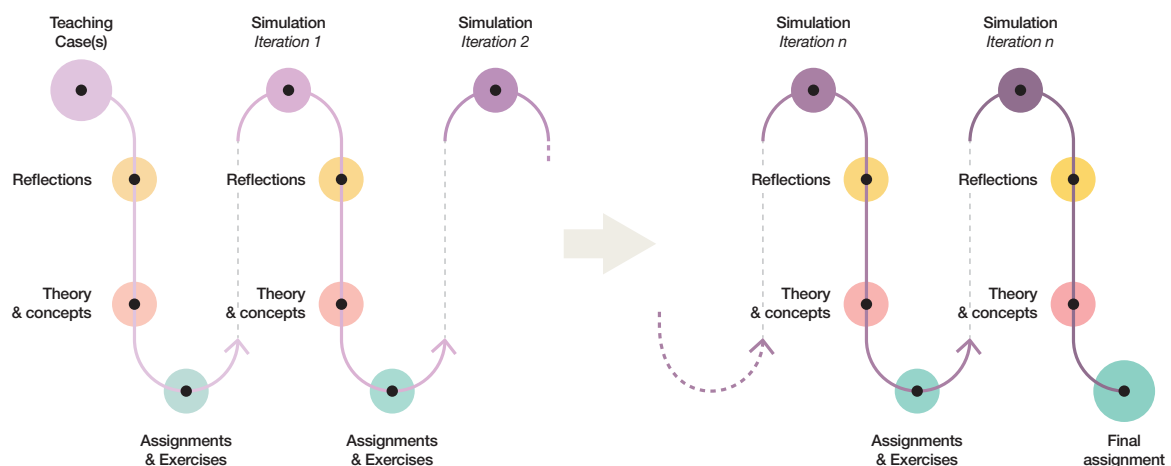


Figure 3: Sequence of activities and choice of methodologies (learning cycle and learning styles)

Adding a strong and overarching storyline would provide the 'glue' between the various learning styles and topics:

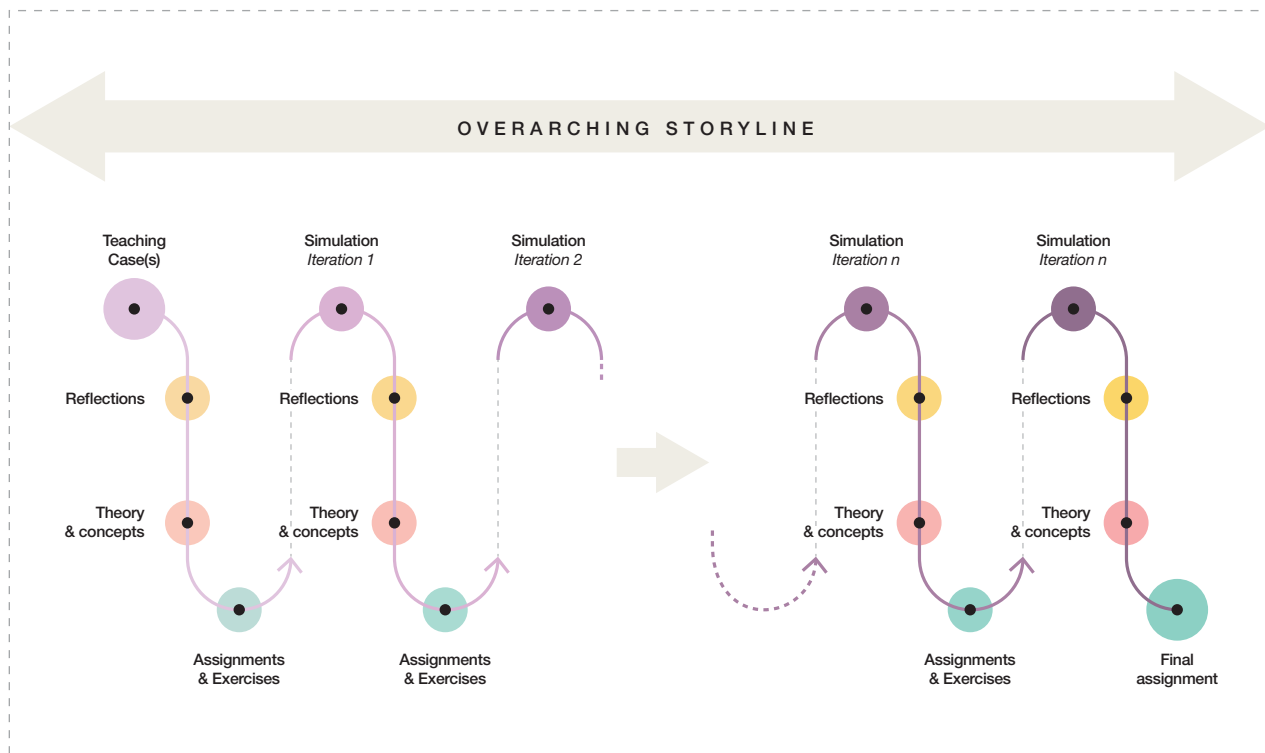


Figure 4: Sequence of activities and choice of methodologies with overarching storyline as captured in the books

Linking the Integrated Learning Approach to Kolb's foundational concepts

In order to highlight the extent to which the Integrated Learning Approach is a specific practical application of Kolb's foundational concepts, we briefly revisit those in the following sections.

The relevance of the concept of the *learning cycle*, *learning styles* and *learning flexibility* for the Integrated Learning Approach

For educators, the general concept of the learning cycle, as well as the notion of not necessarily having to start with the step of concrete experience (CE) is relevant

training, because it directly relates to the type and the sequence of activities, as well as the different methodologies that can be considered by the educator in question (theory, assignments & exercises, teaching cases and business simulations)⁶.

All of the aforementioned methodologies potentially fit very well with the concept of experiential learning and the different learning styles along the learning cycle. Critical, from my perspective, and in line with Kolb's concept of learning flexibility, is to acknowledge that it

^[6] See Annex 2 for a detailed overview of the different methodologies, particularly theory, exercises, teaching cases and business simulations.

is the combination of methodologies that creates a coherent and compelling learning experience. The Integrated Learning Approach clearly builds on such diversity of methodologies.

For example, business simulations can already be a powerful learning instrument by themselves, even when used stand-alone. However, simulations gain even much more strength when used in combination with some of the other methodologies, such as exercises for reflections, some additional theory directly linked to what was experienced in the simulation to drive home the conceptualization, followed by detailed analysis and decision making towards the next iteration of the simulation. Then, after finalizing the activity with the simulation, the course can still further build on what was experienced during the simulation, using it as a specific, concrete and data-rich context for working on other related topics.

Thus, the debriefs become much richer and more diverse and the simulation now becomes a truly integral part of the overall course design, and not necessarily the main dominant activity of the course anymore. As I like to say to educators who consider introducing simulations into their courses: “the simulation is not the same as the course”. In a way, as a colleague phrased it recently: “the simulation is the excuse to get to the debrief”. Why? Because these debriefs are where the other three steps of the learning cycle should be facilitated, in other words, the place where the aim is to really connect the dots.

As Kolb argues: *‘the major implication of experiential learning theory for education is to design educational programs in a way that teaches around the learning cycle so that learners can use and develop all learning styles in a way that complete the learning cycle for them and promotes deep learning’*. In other words, ideally speaking educational designs should cover both the entire learning cycle and all learning styles. This guiding principle can be applied at the macro-level of designing entire programs, but I believe is equally applicable to the micro-level of designing an individual course. In the Integrated Learning Approach, the learning cycle, as well

as the mix of learning styles can be clearly recognized in the sequence of activities, as well as the various iterations applied.

The relevance of the concept of *team learning* for the Integrated Learning Approach

Since most of the in-class activities within the Integrated Learning approach are team-based, this opens up the possibility of not only reflecting on the ‘technical’ content of a course (say: supply chain management or circular economy), but also on the team dynamics and team processes at play at the meta-level: how do the team members collaborate, how do they go about decision making, what happens in the case of differences of opinion, how do they deal with personal and/or cultural differences, and so on. This proves to be particularly enriching if team activities are challenging from a content point of view as well as if they take place under (educator imposed) time pressure.



^[7] I wrote a blogpost around this same argument, called ‘Using Business Simulation Games in Class: from add-on to “add-in”’ (<https://www.koganpage.com/article/using-business-simulation-games-in-class-from-add-on-to-add-in>)

In addition, teamwork itself is based on learning and team members also learn from each other as well as from their team members' learning styles, as Kolb and Peterson argue:

“

Learning is the key to team effectiveness. Virtually every activity that a team undertakes requires new learning from individual team members and the team as a whole. Creating new ideas and approaches, developing plans, making decisions and taking action to implement them are all activities in which learning is central. [...] Appreciating your team members' learning style differences adds to the team's ability to fully engage the team learning cycle.

– Kolb and Peterson, 2019

and put even more strongly:

“

when individuals have an awareness of each other's learning styles, they can work together on high performance teams that achieve exceptional results.

– Kolb and Peterson, 2017

As said, team activities in the Integrated Learning Approach provide a solid basis to leverage such team learning, as well as facilitate active reflection on the topic.

The relevance of the concept of *educator roles* for the Integrated Learning Approach

Whereas traditional one-directional lecturing and testing may be mainly dependent on the roles of *subject expert* and *standard setter & evaluator*, it is the addition of the experiential part of the cycle that calls for different types of roles, styles and, ultimately, skills. This is relevant for educators, since when starting to integrate such experiential activities into their programs and courses, they may need to develop these additional styles and skills.

In a certain way, I believe that experiential learning probably even calls for a **different mindset**, from educators as well as from learners. Inspired a lot by Einstein who allegedly used to say that “he never taught his students, but instead he only provided the conditions in which they could learn”, as well as by the Harvard motto “we will not teach you much, but you will learn a lot!”, I normally say to learners in the beginning of my courses when I introduce the experiential learning approach to them: “ultimately, it's not about me teaching, it's about you learning”.



That way, I remind myself that the objective of a course never is to display as much subject knowledge as I possibly can, that is just not the point of education. By using the phrase I also let the students know that they clearly should not expect a traditional one-way lecturing type of teacher and on top of that I indicate to them that experiential learning also requires a different skill- and mindset on the learner's side. This then sets the scene for really kicking off the course.

From experience I can also confirm that in the application of the Integrated Learning Approach, the **different educator roles** are indeed all relevant:

- Explaining and clarifying theory and answering questions about it;
- Ask questions through exercises and facilitate teaching case discussions;
- Propose and guide specific reflections to connect the dots and link practical application through gameplay to perceptions about the experience and to identified relevant conceptual frameworks;
- Guide individual learners and teams in the business simulation, stimulating them to discover things on their own and experience the complexities first-hand.

Indeed, by some it can be perceived as more challenging for the educator, because one may not be equally prepared for all of these different roles in terms of personality and competencies. At the same time, and I'm speaking for myself here, it is also much more diverse and definitely more fun to be engaged in as an educator.



■ Conclusion

Summarizing, in this whitepaper I have tried to shed some light on the practical application of the foundational concepts of experiential learning, specifically to courses in Higher Education. The thinking is brought together in an Integrated Learning Approach, which promotes the use of a mix of experiential methodologies, such as teaching cases, assignments & exercises and business simulations.

This Integrated Learning Approach, in the specific examples of application to the topics of Supply Chain Management and the Circular Economy, is captured in the two books as mentioned in the Introduction of this paper: Mastering the Supply Chain and Mastering the Circular Economy. Both books build heavily on Kolb's foundations of experiential learning, they cover the full learning cycle and provide methodologies connecting to the different learning styles along the learning cycle, ranging from offering an overview of theory and conceptual frameworks to exercises (explore, analyze, decide, imagine). Each also builds on a specific business

simulation, The Fresh Connection and The Blue Connection, respectively.

Both books also have an overarching storyline to glue the partial topics together: the stories of "**what** and **how?**" and "**simple but not easy**" in the case of Mastering the Supply Chain and the story of the "**Corporate Circular Imperative: narrative** and **numbers**" in the case of Mastering the Circular Economy. Both also have one central conceptual image to support their entire respective stories, which I typically use as recurring images in each of the sessions of a course:

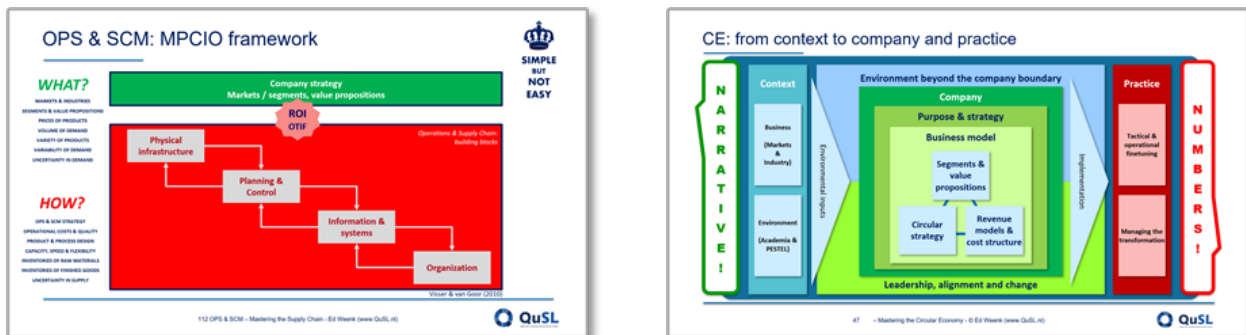


Figure 5: OPS and SCM: the stories of 'what?' and 'how?' and 'simple but not easy' and Circular Economy: the story of 'narrative and numbers' (the corporate circular imperative)

Even though the whitepaper is based on my own extensive experience in teaching, for example in courses about Supply Chain Management, Project Management or the Circular Economy, I think the messages I have tried to convey have a more general applicability to simulation-based courses.

I wish the reader a lot of success and, above all, a lot of fun on their own educational learning journey!

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ANNEX 1

Kolb's foundations of Experiential Learning⁸

The concept of the learning cycle of experiential learning

Very likely, the concept of the **learning cycle** is for many the most well-known part of experiential learning. The cycle consists of four steps, together forming the *'idealized cycle or spiral where the learner touches all the bases'* that was referred to in the cited phrase mentioned before. In order to truly learn, the four bases that the learner should touch are (Kolb's formal terminology between brackets):

- undergoing an experience first-hand (Concrete Experience **CE**),
- allowing for reflection on what happened and why (Reflective Observation **RO**),
- leading to the formation of a conceptual view of the situation, potentially reinforced by existing theories and/or frameworks (Abstract Conceptualization **AC**),

creating the basis for an improved view of the situation (Active Experimentation **AE**), which can be applied in the next experience the learner comes across, thus moving on to the next iteration of the cycle.

Although the sequence between these steps is logically given, Kolb states that it is good to be aware that this doesn't mean that the cycle always has to start with undergoing a concrete experience (CE). As the notion of the cycle indicates, it is in fact a continuous process, which can start in any of the steps of the cycle.

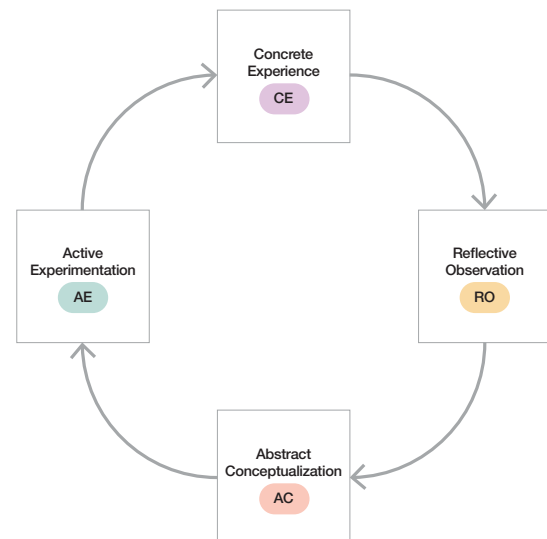


Figure A-1: the learning cycle (after Kolb, 2015)

The concepts of learning styles and learning flexibility

Not all people learn best in exactly the same way. In this context, Kolb speaks about individuality in the process of learning, leading him to address the so-called learning styles. It is beyond the purpose of this whitepaper to explain all of the details of the academic research behind the definition of the learning styles, but ultimately this research has led to what was dubbed 'the Kolb Learning Style Inventory (KLSI)', and which has since then evolved into the Kolb Experiential Learning Profiles. Nine different learning styles are distinguished, each of those mainly connected to two or more of the four steps from the learning cycle:

^[8] Since this Annex is based on one major source, namely Kolb's seminal book on *Experiential Learning* (second edition 2015, see full reference at the end of the paper), no separate reference will be made per sentence or concept addressed in this section. If text is cited literally, this is clearly indicated.

- **Experiencing** ('the ability to find meaning from deep involvement', as phrased by Kolb);
- **Imagining** ('the ability to imagine possibilities by observing and reflecting on experiences');
- **Reflecting** ('the ability to connect experiences and ideas through sustained reflection');
- **Analyzing** ('the ability to integrate and systematize ideas through reflection');
- **Thinking** ('the capacity for disciplined involvement in abstract and logical reasoning');
- **Deciding** ('the ability to use theories and models to decide on problem solutions and courses of action');
- **Acting** ('a strong motivation for goal directed action that integrates people and tasks');
- **Initiating** ('the ability to initiate action in order to deal with experiences and situations'), and
- **Balancing**, which is in way an integrative or maybe even a meta-style ('the ability to adapt: weighing the pros and cons of acting versus reflecting versus experiencing versus thinking').

Research cited by Kolb indicates that most individuals have a preference for certain learning styles, but also that this individual preference is not so much a consequence of 'a fixed personality trait, but more like a habit of learning shaped by experience and choices'. Given the direct connection between certain learning styles and particular steps in the learning cycle, this also implies that an individual's learning effectiveness is primarily dependent on the one or two steps in the learning cycle he or she is more comfortable with, which of course may be a limitation to the ability of true learning in a wide diversity of circumstances.

Kolb then introduces the concept of **learning flexibility**, being 'the ability to use each of the four learning modes to move freely around the learning cycle and to modify one's approach to learning based on the learning situation. [...] The flexibility to move from one learning mode to another in the learning cycle is important for effective learning [...] Learning flexibility broadens the learning comfort zone and allows us to operate comfortably and effectively in more regions of the learning space, promoting deep learning and development'.

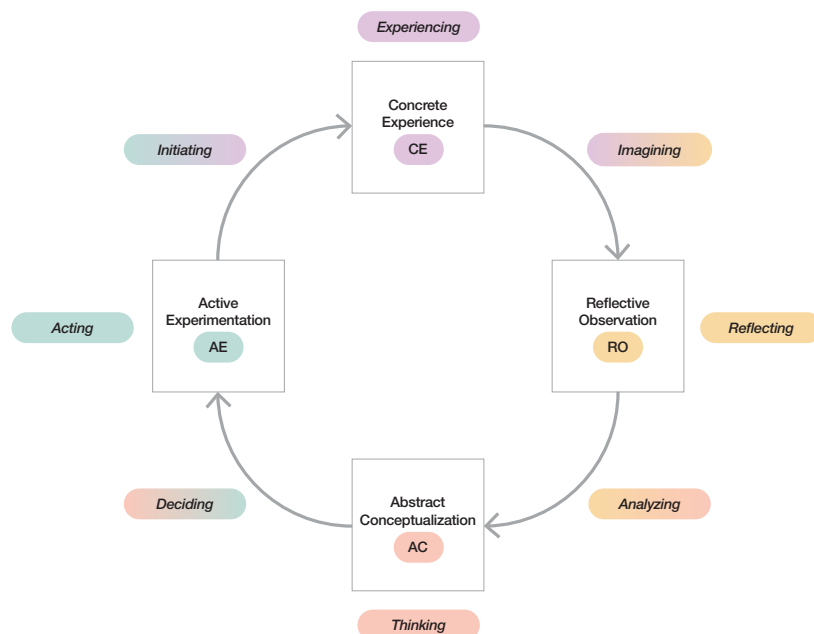


Figure A-2: learning styles along the learning cycle (after Kolb, 2015)

The concept of educator roles

If an educator should aim for covering the entire learning cycle as well as addressing all learning styles, then what does this mean for the role the educator should assume? Having students undergo a concrete experience calls for a different way of acting by the educator than to guide students through abstract conceptualization. This brings us to the third and last concept I want to highlight here in relation to the foundations of experiential learning, which is what Kolb has dubbed **educator roles**: 'a patterned set of behaviors that emerge in response to the learning environment including students and the demands of the learning task'.

Similar to the match of learning styles to the different stages of the learning cycle, a 'dynamic matching model' has been developed which links four different educator roles to the learning cycle:

- Facilitator, with a 'warm affirming style', covering the learning space between the steps of concrete experience (CE) and reflective observation (RO);
- Subject expert, with a 'reflective authoritative style', covering the learning space between the steps of reflective observation (RO) and abstract conceptualization (AC);
- Standard setter & evaluator, with an 'objective result-oriented style', covering the learning space between the steps of abstract conceptualization (AC) and active experimentation (AE);
- Coach, with an 'applied collaborative style', covering the learning space between the steps of active experimentation (AE) and concrete experience (CE).

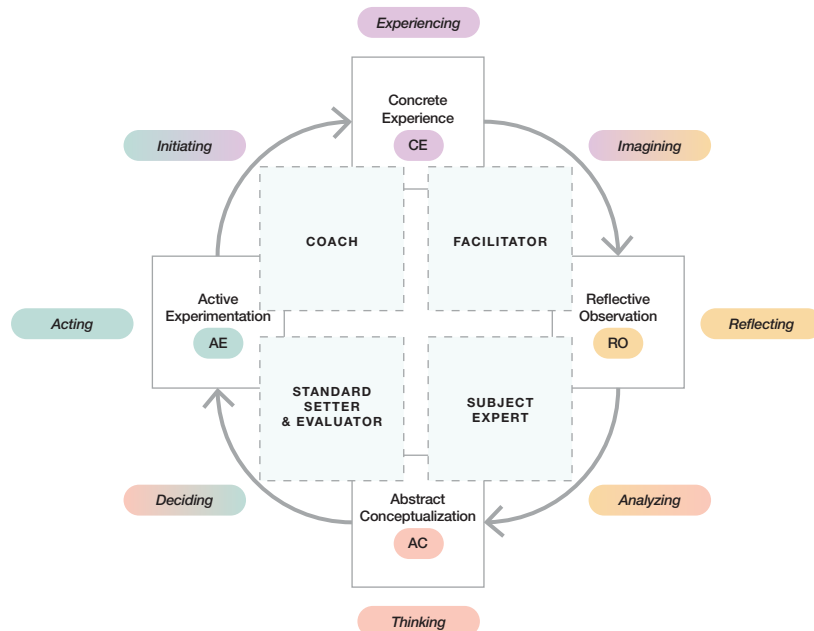


Figure A-3: learning styles and educator roles along the learning cycle (after Kolb, 2015)

ANNEX 2

Building blocks for experiential learning in Higher Education

Theory

Probably, theory is the first building block of Higher Education that most people would think of and that therefore doesn't need much further introduction. Obtained through books, articles and/or lecturing, the main difference between the use of theory within classical theory-centered courses and within experiential learning is that in the latter case, theory is no longer the main dominant building block of the entire program or course, but specifically geared towards direct application in the step of abstract conceptualization (AC).

Assignments and exercises, projects

Assignments and exercises are also widely used in education. They can be from very broad and generic to very specific, from very high-level exploratory to very detailed and deeply analysis- or decision-driven. They can be designed for carrying out in teams or by individual learners. The educator can decide to grade the results or not. Arguably, a project can be seen as a large assignment, to be carried out over a longer period of time, thus allowing for a wider scope and/or more depth in the elaboration.

Field research

Field research indicates an activity where learners are asked to leave the classroom and investigate a topic first hand in the real world, by observing, interviewing, and so on. Typically, this is a very enriching experience for learners. However, it is fair to say that it can be quite time consuming and depending on the location and the

surroundings of the school and the characteristics of the neighborhood, there may be practical barriers to integrating field research into course designs.

Teaching Cases

Teaching cases form a very powerful methodology, historically championed by Harvard Business School. They are typically based on a real-life situation of a real-life company, presenting an extensive amount of real-life data, putting the student at the heart of the action by having them take the role and position of the case's protagonist. Ideally speaking, teaching cases are very open-ended, thus challenging the student to make a profound analysis of the situation (including its context, uncertainty and limitations) and come up with reasonable, feasible and viable action plans.

Teaching cases allow for a lot of in-depth discussion on very specific topics. The process of working with teaching cases starts with individual preparation, often guided by preparation questions that accompany the case, followed by small-group discussion to confront one's own interpretations and ideas with the ones of team mates. This is then followed by plenary class discussion guided by the course instructor. This group-wide interaction and confrontation of viewpoints and ideas are the key to effective learning with cases.

A potential disadvantage is that teaching cases have a specific setting (country, industry, year) and that therefore they may 'age'. Sometimes this occurs even independently of the enduring validity of the topic at hand (for example, there are marvelous and still very relevant Harvard cases about Supply Chain Management, which because of their production date in the first half of the 1990's are very likely to be perceived by students as outdated).

Business simulations

Simulations have existed for a long time already, for example in the form of educational board games. With the ongoing development of more and more sophisticated technology, nowadays most simulations are built on digital platforms. Whereas teaching cases facilitate scenario development on the basis of much data about content as well as context, and in-depth discussion and interaction and confrontation of ideas and viewpoints, business simulations typically focus a bit more on content. However, at the 'expense' of this slightly more narrow scope, simulations allow for more deep and extended experience of seeing the results of one's actions, in other words gain a better understanding of cause-and-effect, even allowing for a certain degree of trial and error, something which is practically impossible when using cases. This is for me one of the most important parts of added value of using simulations, particularly when used as complementary to cases.

When looking for suitable business simulations for use in my own courses, I formulated the following selection criteria. The business simulation should:

- Address relevant topics, from the perspective of directly linking to the core topics and learning objectives of the specific course it's intended for;
 - Reflect real-life complexity, both in terms of complexity of the 'technical' content related to the course topics and in terms of organizational complexity (structure, functional roles) and organizational dynamics (trade-offs, alignment between departments);
 - Be doable in the available timeframe of the course, in a way that it does provide the required 'concrete experience', but doesn't become too dominant in terms of the time dedicated to the simulation in class versus the total available contact hours.
 - Have an intuitive user interface, and preferably no need for an extensive simulation user manual or, alternatively have more playful ways of getting to know the simulation;
- Over time, I have noticed that there are two more criteria which come in as very useful:
- Does the simulation offer a basis for competition? Some people refer to this as the 'gamification' element. I will briefly come back to this a bit further on in this paper.
 - Does the simulation come with complementary supporting materials, such as background information for educators, supporting presentation materials and exercises, as well as fast and effective technical and content-driven support?



ANNEX 3

Dublin Descriptors and Bloom's Taxonomy

Dublin Descriptors

According to the website of the European Consortium for Accreditation ECA:



the Dublin Descriptors are the cycle descriptors (or "level descriptors") presented in 2003 and adopted in 2005 as the Qualifications Framework of the European Higher Education Area. They offer generic statements of typical expectations of achievements and abilities associated with awards that represent the end of each of a (Bologna) cycle or level. The descriptors are phrased in terms of competence levels, not learning outcomes, and they enable to distinguish in a broad and general manner between the different cycles. A level descriptor includes the following five components:

- Knowledge and understanding
- Applying knowledge and understanding
- Making judgements
- Communication
- Lifelong learning skills

Source: http://www.ecahe.eu/w/index.php/Dublin_Descriptors

Bloom's Taxonomy

According to website
Bloom's Taxonomy:



In 1956, Benjamin Bloom with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl published a framework for categorizing educational goals: Taxonomy of Educational Objectives.

Familiarly known as Bloom's Taxonomy, this framework has been applied by generations of K-12 teachers, college and university instructors and professors in their teaching.

The framework elaborated by Bloom and his collaborators consisted of six major categories: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The categories after Knowledge were presented as "skills and abilities," with the understanding that knowledge was the necessary precondition for putting these skills and abilities into practice.

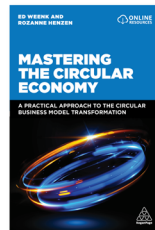
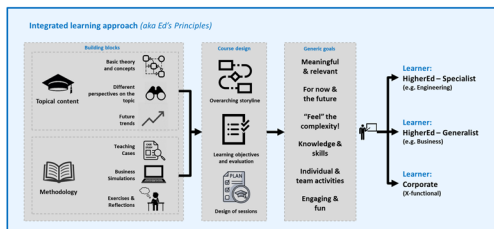
Source: <https://www.bloomstaxonomy.net/>

ANNEX 4

“Mastering the Circular Economy” and “Mastering the Supply Chain”

“Mastering the Circular Economy” with The Blue Connection

- Integrated learning approach (aka ‘Ed’s Principles’) applied to CE



1 book

- “Mastering the Circular Economy”

1 storyline

- The story of ‘The Corporate Circular Imperative’: Narrative & Numbers

3 perspectives of CE

- Company perspective
- Leadership perspective
- Perspective beyond the company boundary
- Based on 25 years of working experience
- Based on 15 years of teaching experience
- Relevant theory, 300+ references (Part 1)
- Direct link of theory to the simulation (Part 2)
- Cases linked to but beyond the sim (Part 3)
- 90+ practical exercises in all parts of the book



Simulation



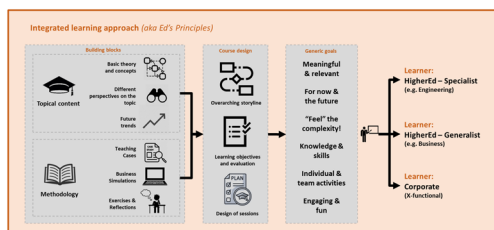
PPT's



Additional teaching cases

“Mastering the Supply Chain” with The Fresh Connection

- Integrated learning approach (aka ‘Ed’s Principles’) applied to OPS & SCM



1 book

- “Mastering the Supply Chain”

2 storylines

- The story of ‘What?’ and ‘How?’
- The story of ‘Simple but not easy’

3 dimensions of SCM

- Business dimension
- Technical dimension
- Leadership dimension
- Based on 25 years of working experience
- Based on 15 years of teaching experience
- Relevant theory (Part 1)
- Direct link to the game (Part 2)
- Cases beyond the game (Part 3)
- 80+ exercises



Simulation



PPT's



Additional teaching cases

■ About the Author

Ed Weenk, MSc. PDEng. is an experienced lecturer, corporate advisor and workshop & training facilitator. His professional passions are sustainable operations & supply chain, managers & management, projects & project management, training & teaching and business simulations & experiential learning.

He has extensive practical experience since the mid 1990's in managing international logistics and distribution projects at strategic and operational level and is a strong believer in the principles of experiential learning. Next to his practice as an independent professional, he is delivery partner and authorized trainer in the business simulations of Inchainge of The Netherlands and Palatine Group of New York, USA.

Ed collaborates as a Senior Associate Professor at different business schools, like EADA Barcelona (Spain), Maastricht School of Management (The Netherlands), TIAS School for Business & Society (The Netherlands), Antwerp Management School (Belgium), WU Wien Executive Academy (Austria), Rotterdam School of Management (The Netherlands) and Centrum Graduate School of Business (Lima, Peru). His specialisation is on the topics of operations & supply chain management, circular economy, project management and intra- & entrepreneurship. At EADA Business School Barcelona he was chosen 'Professor of the Year' five times in a row by the students of the Fulltime International MBA.

Ed has previously written a management book titled "The Perfect Pass: what the manager can learn from the football trainer", published in English, Spanish and Dutch, about the importance of seeing the big picture, having good internal and external alignment and achieving coherence at all levels. In 2019 his second book was published, titled "Mastering the Supply Chain. Principles, practice and real-life applications", now available in English and Dutch. Similar to Mastering the Circular Economy, this book combines relevant theory and frameworks with practical application through a business simulation.

