Entrepreneurship Education in Digital Environments: Developing a Didactic Framework for a New Era

Ronny Baierl and René Thamm

Abstract This chapter introduces a new didactic framework on entrepreneurship education in digital environments. We base our arguments on theoretical insights gained by the literature on didactics in general and on entrepreneurship education in particular. In addition, we include practical experiences gained by two successfully delivered summer schools, in the real world and in the digital world, and our expertise based on lectures at our university. As a result, our framework covers five dimensions in which several aspects of digital and nondigital competencies are trained. We discuss our framework and suggest fruitful avenues for educators and researchers in the field.

Keywords Digital and nondigital competencies · Hybrid teaching · Hybrid learning · Team collaboration · Role models · Simulation

1 Introduction to Entrepreneurship Education

The impact and need for entrepreneurship education at higher education institutions are still an important part in academic discussions. The relationship between entrepreneurship education and entrepreneurial competencies and entrepreneurial intention represents one of the key issues here. This relationship is affected by several factors. Within that chapter we follow the established perception that entrepreneurs are made, not born (Gorman et al., 1997; Ernst & Young, 2011), and that entrepreneurship programmes generate a positive impact (Galloway & Brown, 2002; Nabi et al., 2017; Li & Wu, 2019; Wei et al., 2019; Boubker et al., 2021).

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Recent data provided by the Global Entrepreneurship Monitor underline the rising number of entrepreneurship professorships reflecting an increasing relevance in Germany. The results also show that participants still perceive their preparation for successful business creation and their required capabilities to be at a relatively low level (Bosma et al., 2021; Sternberg et al., 2021). This finding calls for continuous improvements in the field of entrepreneurship education. Especially from an international perspective, the way entrepreneurship is taught differs across universities to a great extent (Fayolle & Klandt, 2006). Even though applied or 'hands-on' teaching methods promise more effective teaching (Gorman et al., 1997; Edelman et al., 2008), classical lecturing is still a common method. As an example, while entrepreneurship research clearly points out the moderate value of written business plans, seminars on 'how to write a convincing business plan' are still incorporated in many university programmes.

Although entrepreneurship education has manifold facets, educational programmes unite the intention not only to teach management tools but also to form personalities and promote entrepreneurial attitudes (Fretschner & Weber, 2013; Kuckertz, 2013). Thus, entrepreneurship education should support entrepreneurial competencies and entrepreneurial intention as the best predictor of subsequent behaviour.

Our work is a further addition to the development of a holistic entrepreneurship education approach. For doing so, recent literature considers different perspectives (Maritz & Brown, 2013; Fayolle, 2013; Klapper & Neergaard, 2017): for example, 'why' looks at the goals and objectives of the programme. 'What' discusses the needed content to improve entrepreneurial competencies, and 'how' deals with the used didactic methods. Furthermore, among other perspectives, the programme has to be tailored to the target audience ('for whom') and take the place of learning and teaching ('where') into account. Within that chapter we focus on 'where' and 'how':

- Where: entrepreneurial learning is not limited to a physical classroom. Digital learning environments play an increasingly important role, as digital skills become more relevant as core competencies for entrepreneurs.
- How: the pedagogical methods used in entrepreneurship education should be mixed. This involves passive and action-oriented teaching as well as problem-solving in real-life situations (Nabi et al., 2017; Mwasalwiba, 2010).

This chapters describes the five dimensions of our developed teaching approach and evaluates their impact on digital and nondigital competencies from our perspective. The introduced approach is a result of analysing international research. Moreover, we included the experiences and students' feedback from a summer school with the German Jordanian University that took place prior to the COVID-19 pandemic, from virtual joint teaching with students from the same university and our university in 2020 and from planning joint hybrid teaching in 2021.

2 Digital and Nondigital Competencies for a New Framework

The desired outcome of our teaching approach is aligned with the future skills framework developed by the Stifterverband in collaboration with McKinsey & Company (Kirchherr et al., 2019). This framework aims to outline the needed abilities for tomorrow's world of work. The suggested set of core competencies can be distinguished into technical, digital and nondigital skills. We explicitly respect nondigital skills that cover a wide range of what is well known as the entrepreneurial mindset (Bacigalupo et al., 2016), including problem-solving, creativity, entrepreneurial action, self-initiative, adaptability and perseverance.

In complement, digital skills should receive more attention, as acting confidently in digital environments is crucial for entrepreneurs. These skills include the competence of digital knowledge acquisition (digital learning) and the ability to work effectively and agilely in virtual teams (digital collaboration and agile work) by utilizing adequate communications (digital interaction). In addition, digital literacy reflects the increasing relevance of safety rules and data protection. Digital ethics stands for a critical analysis of one's own digital activity (Kirchherr et al., 2019).

At its core, our framework consists of five dimensions and follows an applied and 'hands-on' didactical approach (Kuckertz, 2013). As 'doing is better than learning', we focus on realizing own entrepreneurial projects that affect the knowledge and entrepreneurial motivation of students. The following sections describe the main idea of each dimension and discuss the effects on digital and nondigital skills.

2.1 Dimension 1: Hybrid Teaching

From the very beginning, our summer school was built up on various teaching approaches. Considering the different knowledge bases of our audience, we combined passive and active teaching elements. Thus, the curriculum includes keynote speeches to inform students about recent entrepreneurship methods and tools from textbook-based theories and models (Gassmann et al., 2020; da Rin & Hellmann, 2020). Simultaneously, every theoretical input was expanded with appropriate exercises. From our perspective, students should be guided step by step to enable them to develop a business idea (e.g. design-thinking methods), describe their business model (e.g. business model canvas) and understand the financial consequences of its implementation (e.g. financial planning). In addition, to ensure active participation and simulate real-life experiences, we used a business simulation (see Sect. 2.5) as the second part of our summer school.

In 2019, when the summer school took place for the first time in Amman, we ran the whole curriculum face-to-face. One year later, the COVID-19 pandemic forced us to completely shift to a distance learning approach. Encouraged by empirical results indicating similar learning outcomes from face-to-face vs. distance learning

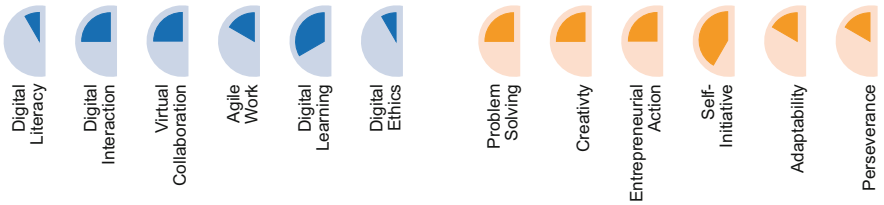

Fig. 1 Consequences of hybrid teaching

(Means et al., 2013), we took the opportunity to adjust our teaching focus by including the development of digital skills. First, the keynote speeches were recorded and made available in an online library. Additionally, we motivated our students to search for more information in digital databases and pointed to the reliability of sources. Second, weekly video conferences were established to provide a platform for coaching, feedback and explaining the forthcoming tasks. Third, guest speakers were invited to join the conferences, and business idea pitches were performed online (see Sect. 2.4).

Online teaching of the entrepreneurial mindset is challenging (Liguori & Winkler, 2020). Fortunately, the utilized simulation is cloud-based and, thus, very appropriate for distance learning. Nevertheless, creating an active, constructive, and collaborative online learning environment is challenging. Our experience shows that success mainly depends on the previous digital experiences of students. In entrepreneurship education programmes, E-learning elements may provide an extra advantage to support self-determined acting. Nevertheless, undergraduate students may especially suffer from overtraining. Therefore, we recommend either choosing a blended learning approach or offering a complementary course of basic digital working skills in advance. As a result, especially, digital learning and self-initiative benefit from this approach in our understanding as shown in Fig. 1.

2.2 Dimension 2: Intercultural Team Collaboration

'[T]he "entrepreneur" in entrepreneurship is more likely to be plural, rather than singular' (Gartner et al., 1994). In addition to the high popularity of that quote by Gartner and colleagues, the implication for entrepreneurship education is as concise as the quote itself: entrepreneurship must be taught in teams. Consequently, we included the advantages of team cooperation in our framework, as do many educators do (Li & Wu, 2019). In addition, we included intercultural aspects by composing teams of students from different cultural backgrounds and geographical origins (Stefanic et al., 2020).

Despite the numerous advantages of such an intercultural approach in terms of the intercultural competences acquired by participating students, geographic distance is of great importance to our framework, as it forces participants to communicate in

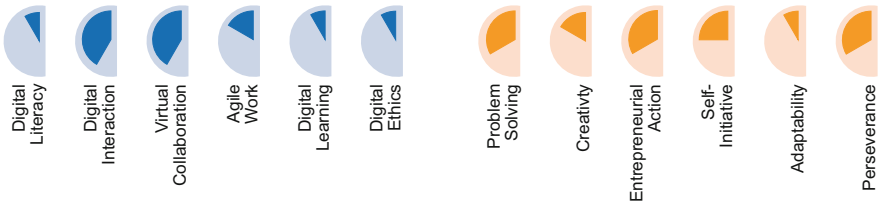

Fig. 2 Consequences of intercultural team collaboration

digital rather than in real rooms. As we have learned in prior projects, students typically prefer real appointments instead of virtual appointments when they live close to each other. As a concrete (pre-COVID-19) example, students living in the same town but studying at different universities rejected the use of virtual meetings. Instead, they preferred to meet each other at one of the participating universities or at common leisure meeting points (Clauss et al., 2020).

Entrepreneurship educators often discuss how team composition should be organized: self-combined teams may benefit from interpersonal advantages, while randomly selected team members typically show greater heterogeneity that is clearly beneficial in entrepreneurial contexts. Despite the obvious advantages of self-selected team membership in other contexts, we decided to follow a team composition approach in which team members are selected by educators (Mannix & Neale, 2005).

We decided to include the concept of diversity fault lines as it acknowledges the multivariate nature of diversity. Thus, we focused on origin and gender as the two most prominent variables describing our students (in fact, age and experience were very homogeneously distributed). Except for these two variables, team composition was random. In other words, we composed the teams in such a way that female and male students were mixed; the same held true for the origin (German and Jordanian) of the participating students and especially for the combination of both variables. In the understanding of diversity fault lines, we avoided situations in which, for example, two German male students belonged to a team with two Jordanian female students; as such a team would obviously generate strong diversity fault lines (Thatcher et al., 2003). As a result, digital interaction and virtual collaboration on one side and problem-solving, entrepreneurial action and perseverance on the other side benefit from such a setting in our understanding as shown in Fig. 2.

2.3 Dimension 3: Hybrid Learning

Based on our hybrid teaching approach discussed in Sect. 2.1, we included a second dimension of hybrid environments in our framework: hybrid learning accounts for the students' perspective and, thus, complements the hybrid teaching perspective in a

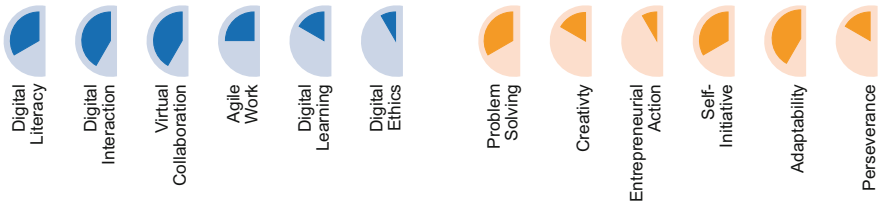

Fig. 3 Consequences of hybrid learning

holistic understanding. To do so, we offered a rich spectrum of available tools and online platforms to our students.

First, we utilized generalistic platforms, including a self-developed learning platform that is used by Saxonian universities, online whiteboards and team collaboration software, as well as general communication platforms. Our experience shows that students prefer the learning environment that is typically used at their universities. If two (or even more) universities collaborate, focusing on established and easy-to-use platforms is advisable to prevent students' rejection. Within such platforms, several tools can typically be implemented for virtual collaboration. As students prefer different tools, the participants themselves should make the exact selections. In other words, forcing students to use a specific tool is not advisable, as it can lead to unintended refusal.

This is especially true in regard to communication: in our case, students automatically switched to a free-of-charge messenger service that is used by more than 2 billion people in over 180 countries instead of using the communication tools available in our learning platform. In addition to (negative) consequences in terms of not collectable learning analytics, aspects of digital ethics should be faced. In fact, we see a great potential for sensitizing students regarding aspects of data privacy and secure data transport. This is especially important in international settings, as national regulations and experienced usage may differ dramatically.

Second, we included an entrepreneurship-specific platform (Huebscher & Lendner, 2010) for our simulation approach (see Sect. 2.5). As this platform is new to every participant, it is necessary to include a focused introduction to point out specific aspects, either online or offline. However, it is not necessary to include a detailed step-by-step tutorial for each and every functionality here. Based on our experience, students often get bored when showing functionalities in detail instead of delivering a comprehensive overview. By including this platform, digital competencies, especially in terms of digital self-confidence and self-reliance, are pronounced. As a consequence, hybrid learning environments especially support digital interaction and virtual collaboration and enable problem-solving and adaptability in our understanding as shown in Fig. 3.

2.4 Dimension 4: Entrepreneurial Role Models

Several studies emphasize the importance of confronting students with role models (Toledano & Urbano, 2008; BarNir et al., 2011; Mueller, 2011). Although family role models have outstanding relevance (Carr & Sequeira, 2007), additional role models promise positive effects. Thus, we invited entrepreneurs and small business managers not only as guest speakers but also as representatives of fictive investment companies during our pitch presentations. In other words, sharing their experiences is only one side of the coin. We aimed to stimulate communication with our students by involving these role models in the learning and assessment process. Additionally, we provided an informal forum for individual support, feedback and networking.

As perceived distance between students and role models may evolve negative effects, we explicitly considered age and a comparable personal history when choosing the role models (Kuckertz, 2013; Liu et al., 2019). To ensure the highest possible identification, alumni of involved universities are suitable contacts. Although sometimes a higher impact of success than failure stories is reported (Liu et al., 2019), we recommend the inclusion of both sides of the story to draw a realistic picture of entrepreneurial career paths (Abbasianchavari & Moritz, 2021).

Finally, lecturers play an important role. As coaches and facilitators, they accompany and navigate students through the entrepreneurial learning process, demonstrate openness to explore, test new frameworks and increase the awareness of entrepreneurship as a valuable carrier choice (Mueller, 2011; Rahman & Day, 2015). Integrated role models have a stronger effect on entrepreneurial desirability than on entrepreneurial feasibility (Fellnhofer & Puumalainen, 2017). Therefore, this dimension mainly contributes to self-initiative and entrepreneurial action in our understanding as shown in Fig. 4.

2.5 Dimension 5: Business Simulation

As already mentioned in Sect. 2.3, we utilized entrepreneurship-specific simulation software and, thus, added elements of gamification to our framework (Isabelle, 2020). Although several good and very good simulation tools are available at the market, we chose the software of a Germany-based, well-established provider of

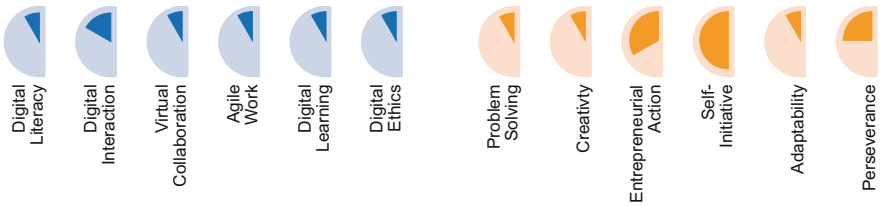

Fig. 4 Consequences of entrepreneurial role models

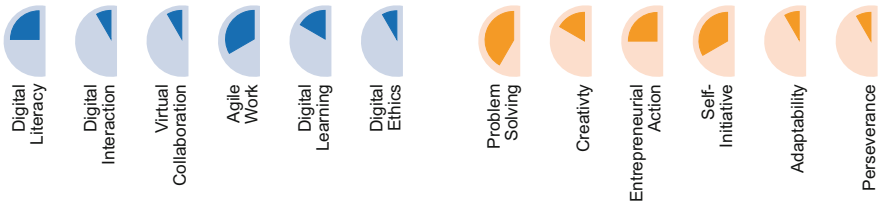

Fig. 5 Consequences of business simulation

management simulations. The selected software is beneficial to our didactic framework in three dimensions.

First, the selected software combines a classic simulation approach with more entrepreneurial and creative aspects. In fact, the programme includes the well-known business model canvas (Osterwalder & Pigneur, 2010) within the first phase. Based on the entries within that framework and (fictive) negotiations with investors (see Sect. 2.4), the instructor of the simulation may manually change the simulation's settings. As an example, as innovativeness cannot be evaluated by software automatically, the instructor may evaluate the business model canvas in that dimension. In turn, she/he is allowed to change the innovation index, for example, by adding ten points. The same holds true for the amount of money invested and many other variables. While this procedure requests a well-trained instructor (in fact, participating in one of the provider's official trainings is advisable), the advantages are overwhelming: standard values for subsequent simulation can be adjusted in such a way that individual (either creative or entrepreneurial or financial) aspects are acknowledged (Topsim Startup, 2019).

Second, a business model canvas workshop represents a perfectly fitting starting point. Depending on the participants' prior knowledge, such a workshop can take place in real or in virtual rooms. Based on our experience, we advocate for a face-to-face approach. During such a workshop, the newly composed team may benefit from real-world interactions, such as from the advantages of talking to each other in presence. Nevertheless, the business model canvas workshop can be virtualized if required.

Third, the subsequent simulation phase closely corresponds to traditional management simulations. In other words, this phase represents the transition from initiating the pre-start-up phase to managing the growth phase and, thus, accounts for organizational ambidexterity as a concept to utilize exploration and exploitation in parallel (O'Reilly III & Tushman, 2013). From our perspective, shortening that phase from six to four periods is advisable. As a result, especially, agile work and problem-solving benefit from that dimension in our understanding as shown in Fig. 5.

3 Summary of Digital and Nondigital Competencies

As shown above, each of the five dimensions of our didactic framework targets several aspects of digital and nondigital competencies. In summary, we aggregated the illustrated consequences in such a way that, in total, the maximal value of every competence is acknowledged. This procedure represents the compensable nature of actions on competencies. Figure 6 provides an overview of consequences.

In detail, the dimensions of our framework focus strongly on digital interaction and virtual collaboration. Digital literacy, agile work and digital learning are also targeted by our framework. As already mentioned in Sect. 2.3, aspects of digital ethics play only a minor role. In fact, when starting with our projects, we expected that, for example, digital information and their value would not truly play an important role in our setting. Nevertheless, we have learned that aspects of data security and accessibility are of great importance, especially in international contexts. Thus, we call for a better inclusion of this important digital competence in future projects.

On the other hand, the dimensions of our framework underline self-initiative, problem solving and adaptability. In fact, this is completely in line with our understanding of entrepreneurship education programmes. Additionally, entrepreneurial action and perseverance are supported by our framework. As we decided to include existing simulation software, creativity can be covered to only a limited extent. In fact, an important prerequisite for running managerial simulations is a common database. Therefore, the software used in our project offers the same background information and the same start-up environment to every participant (startup.topsim.com/en, 2023). Although all teams work on the same (fictive) start-up, the generated results in terms of creativity are remarkable. Nevertheless, focusing on real start-ups and own innovations may be advantageous in other contexts.

This chapter was set out to deliver a didactic framework for entrepreneurship education practitioners. Therefore, the introduced approach helps entrepreneurship education practitioners develop their own entrepreneurship programmes – in a national or international context, as a curricula course or a comprehensive summer school or taught alone or with colleagues. Our results represent a valuable guideline to develop a best fitting programme for several circumstances instead of delivering a 'blueprint for the best entrepreneurship education programme'. In other words, its implications are mainly practical in nature. Nevertheless, researchers may benefit

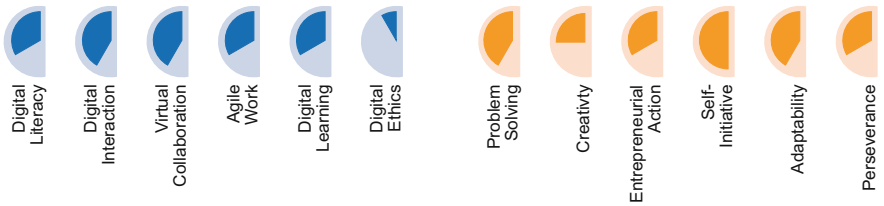

Fig. 6 Overview of consequences

from our framework in two dimensions. First, the structure may be beneficial for subsequent research projects in the field. Second, the limitations of our approach deliver fruitful avenues for further research. Especially the subjective evaluation of the consequences in each dimension may benefit from a more rigorous way of measurement.

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