Students' perceptions of gained and lost value: a case study of a summer school that had to suddenly move online

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Abstract

In 2020, the early Covid-19 lockdown and social distancing induced the abrupt migration of traditionally presential learning activities to online domains. This "new normal" environment affected management not only of training courses, but also educational events whose main added value consisted in providing students with an interactive experience onsite, as it is the case of inter-institutional summer schools. The following research corresponds to a case study in which our organization, a French university, had to reformulate, in less than three months, one of its traditional summer schools while trying to keep the original goals. We aimed at identifying the impact of four managerial decisions by analyzing, through qualitative and quantitative surveys, students' perception of gained or lost value regarding four topics: a) online teaching, b) pre-recorded busines cases providers, c) online social events, and d) technical solutions. With an emphasis in both *didactics* (i.e., knowledge) and *pedagogics* (i.e., learning experience), the analysis of perceived value allowed as to learn about students' assessment position, which revealed two main issues at stake: *belonging*, in relation to students' identity and academic background, and *performing*, related to students' expectations.

Keywords: value, value perception, assessment, learning organization, online learning, Covid-19, innovation education

1. Introduction

After Covid-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, the teaching-learning process of more than half of the world's student population was affected by the sudden shutdown of facilities. At short notice, educational organizations were pushed to take crucial managerial decisions to re-configurate their traditionally face-to-face activities, including internships (e.g., see White et al., 2021), conferences, and summer schools. In this *new normal,* in the economic, social-political, and technological spheres of life (Ahlstrom et al., 2020), a vast number of solutions involved migrating to fully online platform systems to comply with the (inter) national sanitary regulations. As a result, webinars, for example, increased 300% in 2020 compared to 2019 (Nepal, 2020).

The reconfiguration of the educational field, often defined as a "pedagogical shift" (Rafi et al., 2020), an "online transition" (Basilaia and Kvavadze, 2020; Priyadarshini and Bhaumik, 2020) or an "emergency remote teaching" (Hodges et al., 2020; Watermeyer et al., 2020), has been marked by strategic managerial decisions at organizational (e.g., funding institutions and partner universities) and individual levels (e.g., teachers, course designers and students). Generally, in this research we describe a case study in which our organization, a postgraduate unit within the University of Rennes 1, France, had to react, at the start of the pandemic in 2020, to reformulate quickly one of its most acknowledged educational activities in less than three months, i.e., a two-week international summer school, on the topic of "smart cities", which would have normally host around 50 engineering students from all over Europe. Specifically, we assess the impact of the managerial decisions taken to reformulate the event so that the goals of the European activity leading coordinator, EIT Digital[1], could be attained.

Managerial decisions in 'fast-changing environments' constitutes a large body of inquiry. As an example, some research has proposed the notion of "improvised decisions" (Kamoche and Cunha, 2001; Miner et al., 2001), which accounts for a resolutive action when no plans are available (Hatch, 1997; Moorman and Miner, 1998; Roux-Dufort and Vidaillet, 2014). A key feature of this academic research is that 'improvised decisions' are often approached from the point of view of decision makers, i.e., how members behave (individually, interpersonally, organizationally) towards an unexpected situation (Hadida et al., 2014).

While keeping distance from the so-called 'improvisation' perspective, in the present study we put emphasis on the *user* (this is, students attending the educational activity), considered here as the stakeholder which is mostly affected by the managerial decisions of our organization. Although all summer-school-related stakeholders are in some way impacted by *reactive* decisions (e.g., instructors, business case providers, etc.), students, as users, are particularly vulnerable since they have little or no formal negotiation power in decisions (Jamieson and Thomas, 1974).

To understand the impact of the organization's reformulation decisions on users, we analyze how the proposed (new and emergent) functionalities deployed along the abruptly-shifted-to-online summer school were assessed or perceived by the students once they finished their learning

[1] European Institute of Innovation and Technology, EIT, is an independent branch of the European Union that spurs Innovation and Entrepreneurship across Europe. It is worth noting that EIT Digital sponsors several educative programs across partner European universities, for example, international summer schools.

activities. Such assessment is conceptualized and analyzed in terms of negatively or positively perceived value, i.e., if the online functionalities are positively assessed, then value is *gained*, while if some of its features are negatively evaluated, value is *lost*[2].

Among the quick reactive actions taken by our organization, four main decisions can be found: 1) defining, selecting and collecting pre-recorded (or asynchronic) business case presentations instead of having real time face-to-face conferences from industry experts; 2) offering online coaching sessions instead of presential workshops; 3) preparing online social events instead of presential socialization activities; and 4) using the most convenient technological solutions (communication platforms) for administrating the activities.

The four reactive decisions may have led to *tensions* among stakeholders. Smith and Lewis (2011) proposed a model including four core categories of "paradoxes": *learning* (knowledge), *organizing* (processes), *belonging* (identity and interpersonal relationships), and *performing* (goals), where the last two are of particular importance for our case study. As for belonging, Smith and Lewis (2011) suggest that stakeholders' plurality may drive "tensions of identity". In this sense, instructors and students taking part of the reformulated summer school may behave according to their expected roles played in traditional learning contexts (e.g., meet other participants with similar interests, in the case of students; or generate lively discussions based on participants' attitudes, in the case of instructors) despite the possible digital constrains. As for performing paradoxes, these tensions result in actors' competing strategies and goals (Smith and Lewis, 2011). In the shifted-to-online summer school, students with non-entrepreneurial background would be interested in learning new business tools while participants with some financial background would prefer developing their entrepreneurial projects.

In line with the four managerial decisions for reshaping an education event and with emphasis on students as users, we aim to learn about the impact of reactive decision-making by exploring perceived value from two dimensions, i.e., didactics and pedagogics, where the former is related to knowledge production and content learning, and the latter is related to experience or learning conditions (Zambrano, 2015). The identification of students' value perception will allow us to acknowledge the impact of organizational improvisation by concretely mapping the paradoxes at stake. Hence, in the context of a case study corresponding to a summer school activity that had to move online due to the Covid-19 sanitary conditions, the objectives leading our research are:

General objective:

- Learn about the impact of reactive decisions (1. preparing pre-recorded business case presentations; 2. offering online coaching sessions; 3. preparing online social events; and 4. defining the most convenient technological solutions) to migrate the summer school to an online domain

[2] Two important properties of value are to be considered: firstly, valuation refers to something by means of evaluative language (Varas, 2020; Vatin, 2013); and secondly, it takes place through a 'performative process' (Dewey, 1923; Muniesa, 2012; Pina-Stranger, 2011) whose study requires observing what people think or do and what occurs on stage (for example, what knowledges are activated, how people interact with objects, and so on).

Specific objectives:

- Identify how students assess or perceive value in the reformulated summer school in terms of *didactics* (i.e., knowledge and content learning) in relation to the four managerial decisions
- Identify how students assess or perceive value in the reformulated summer school in terms of *pedagogics* (i.e., "learning experience") in relation to the four managerial decisions

The content of this article has been organized as follows: firstly, we present our theoretical framework, specifically in relation to the role of knowledge and experience in the assessment of value; secondly, we describe our methodology; and thirdly, we present and discuss our main results.

2. Assessing decisions: perceived value through didactics and pedagogics

In this section we describe, from a theoretical perspective, how the final user of the reformulated summer school activity assesses the results of the managerial decisions. In our case study, students' knowledge (didactics) and students' experience (pedagogics) are used as proxies to account for value perceived as gained or lost in the activity.

2.1 Didactics dimension: a knowledge perspective

By exploring the knowledge dimension, we establish that student's prior or ongoing academic training may lead participants to give a certain value assessment (positive or negative evaluations) in relation to a reformulated event. This idea has its roots in at least three common claims found in the educational field: a) students' prior knowledge can affect learning performance; b) designing engaging lessons, taking into account student's interests, may encourage more active learning participation (Mandernach et al., 2011); and c) differentiated instruction, according to students' background and readiness, has a positive impact on student achievement (e.g., Hall, 2002; Baumgartner et al., 2003; Doubet, 2007; Park, 2018; Joseph et al., 2013). Thus, students' knowledge background would play an important role when assessing their learning activity.

Since differentiated instruction according to students' academic background may lead to positive assessed outcomes in terms of academic achievement, successful learning performance or active participation, it is possible to find research focused on the role of 'prior knowledge'. For instance, Johnson and Lawson (1998), considering a sample of 366 biology students, determined that prior knowledge worked better for an expository-typed instruction. Based on Johnson and Lawson' findings, recent empirical research has put emphasis on the effects of a pedagogical design according to students' knowledge attributes. Chen et al. (2014), for example, explored the effects of the type of learning strategy (using worked examples or not) and prior knowledge on middle school students who were learning chemical formulas from a role play game. The authors found that high prior knowledge raises learners' self-efficacy toward learning and "enhances their perceived value toward learning" (Chen et al., 2014: 179).

Based on this evidence, the perception of value will be explored through the dimension of didactics, conceptualized here as a complementarity between prior knowledge and disciplinary knowledge. Disciplinary knowledge has been defined here as the curricular knowledge

(co)constructed between students and instructors, whereas prior knowledge has been defined as "the whole of a person's actual knowledge that: (a) is available before a certain learning task, (b) is structured in schemata, (c) is declarative and procedural, (d) is partly explicit and partly tacit, and (e) is dynamic in nature and stored in the knowledge base" (Dochy, 1994: 4699)

2.2 Pedagogics dimension: experience

The second dimension to observe the perception of value in the context of a shifted online activity is that of pedagogics, which is materialized in terms of students and teachers' interactional experience (i.e., involving the interactions of the different participants). Recent literature framed in the pandemic context has paid attention to experience mainly through three aspects which are commonly assessed by students or teachers: practices, feelings, and accessibility. With emphasis on the learning practice, one topic that has received considerable attention is time devoted to online activities. Rafi et al. (2020), for example, applying a questionnaire to 364 medicine trainees, found that 42% of the students considered that classes should be short and below 30 minutes. In fact, long sessions and overload triggered a negative assessment among participants about the online learning methodology. According to Priyadarshini and Bhaumik (2020), in a survey applied to 100 students from different schools in Delhi, found that only 35% of pupils considered online classes as effective as face-to-face classes. These assessments have led scholars to provide some guidelines to improve the online teaching experience. Hornsby (2020) and Bao (2020), for example, suggested some principles that should be considered by instructors, such as having collaborative activities, emergency plans for unexpected situations, and a mixture of synchronous and asynchronous events or activities; providing students with flexibility since they may be experiencing different realities; and designing different types of assessment for evaluated tasks.

In the experience dimension, it is also possible to find research accounting for the assessment of feelings or psychological attitudes from students or teachers involved in online activities. Priyadarshini and Bhaumik (2020), for example, found, in a sample of 100 students, that only 50% felt that they possessed adequate digital skills to use online learning tools, whereas the 33.8% thought their digital skills were inadequate. Similarly, Adnan and Anwar (2020), surveying 126 university students in Pakistan, showed that 71.4% felt qualified to use a computer/laptop, and that only 10.3% felt more motivated with online learning than with conventional learning. As for academics' feelings, Watermeyer et al. (2020), with a sample of 1,148 British university teachers, found that 'preparedness' and 'confidence' were assessed differently according to disciplines. For instance, academics from computer sciences felt mostly prepared (66%) and confident (75.8%), while teachers from languages felt less prepared (30.4%) and less confident (48.7%). This sense of lacking the right skills may lead to feel frustration, inhibit learning and, of course, perceive online learning activities as ineffective. Regarding the relation between students and teachers, Boling et al. (2012) found that pupils assessed online courses as an individualizing learning, limiting interaction with others and contributing to a sense of isolation from instructors.

Literature on accessibility, on the other hand, has been focused on students' assessment of access conditions to online sessions (e.g., Dube, 2020; Reimers and Schleicher, 2020), proposing some action lines for specific university programs, for example, in the medicine field (e.g., Rapanta et al., 2020; Tabatabai, 2020). Accessibility is one of the key principles of online learning according to Harasim (2000), however, important gaps in and between countries are still found (see Reimers

and Schleicher, 2020). From a critical standpoint, Dube (2020) discusses the challenges faced by rural learners in South Africa when adjusting to the new mode of learning, characterized by predominant use of online systems and low-tech applications. Although some authors (e.g., Clark et al., 2020) have not found empirical evidence about the pros and cons of distance learning between rural and urban students, Dube (2020) claims that the new online context has excluded many rural learners from teaching and learning due to a lack of resources to connect to the internet and low-tech software's. Thus, accessibility, specifically in relation to the easiness for handling online-teaching applications, may be to a key aspect for assessing the impact of reformulated learning activities.

As we have described so far, we consider didactics (knowledge) and pedagogics (learning experience) as proxies to account for students' perception of value. In the next section, we describe the methodology that will allow us to learn about the impact of reactive decisions (1. preparing pre-recorded business case presentations; 2) offering online coaching sessions; 3) preparing online social events; and 4) defining the most convenient technological solutions to migrate the summer school to an online domain.

3. Methodology

According to our research questions, we have established as a general objective to learn how students assess the shifted-to-online summer school that resulted from managerial decisions. More specifically, we have aimed to a) identify how students assess or perceive value in the shifted-to-online summer school in terms of *didactics* (i.e., knowledge and content learning) in relation to the four managerial decisions; and b) identify how students assess or perceive value in the reformulated summer school in terms of *pedagogics* (i.e., "learning experience") in relation to the four managerial decisions. In the following section, we describe the methodology to meet these objectives.

3.1 Context in a nutshell

The abrupt change of the educational scene impacted heavily on the several stakeholders in charge of organizing the Summer School. Several meetings were held between the European general coordination (in charge of EIT Digital) and the international partners to reformulate the event as coherently as possible, however, the novelty of the situation, the multiples emergencies to be handle by the universities at that time, and the reduction of human resources due to the confinement created a context in which no clear guidelines were available. Uncertainty about the 'online summer school' execution prevailed for more than three months, period in which the general coordination hesitated not only about the financial feasibility but also about the satisfaction rates, which would normally correspond to key metrics for promoting future versions of the event. Since budget had been already allocated and answers were strongly demanded by partners (rumors about cutting off funding had started to circulate), the general coordination decided to change the dates of the Summer School to the third week of August 2020, date in which summer vacations would come to an end for most participants. Despite partners' objections, the decision was irrevocably made.

3.2 Participants

The summer school event, organized by the Université de Rennes 1 and coordinated at a European level by EIT Digital, was finally held online from 17 until 28 August 2020. On the topic "Unleashing the Power of Circular City Data", the general objective of the activity consisted in providing students with knowledge on innovation and entrepreneurship (I&E), thus stimulating the creation of potential technological solutions and a start-up. Of the 26 participants who agreed attending the shifted-to-online version, 15 were part of a computer-related master's program within the EIT Digital consortium while the rest were external participants who were granted a scholarship to motivate their participation. Once enrolled, two groups of participants were distinguished: firstly, the 'Computer Science' group (CS), made up of 18 students, including those with an academic background in electronics and computer science (i.e., Autonomous System, IoT engineering, Cybersecurity and others); secondly, the 'Social Science' group (SS), composed of 8 students, including those with a background in management (Economics or Public Policy) and human sciences (Law, Linguistics). Since the online activity lacked effective socialization, the summer school organizing team decided to divide students into 8 workgroups with the purpose of controlling disciplinary heterogeneity among participants.

3.3 Decisions to achieve a shifted-to-online Summer School

The imperative need to shift the Summer School to a fully online setting engaged our organization with an unprecedent process of adaptation and rapidly decision making. In terms of the production of the summer school, the reactive decisions mainly consisted in four main reformulations: 1) the business cases that were normally presented by professionals by means of onsite conference were pre-recorded; 2) teaching activities were shifted to synchronous online sessions; 3) social events that previously consisted in industrial visits and touristic activities were shifted to virtual cultural visits and online games; 4) the online learning activities had to be carried out through technical platforms that, despite they were not new, were not entirely mastered by instructors or students.

In the following sections, the four main decisions that shaped the shifted-to-online Summer School are described.

3.3.1 Decision 1: Reshaping business cases

The first decision consisted in defining, selecting and collecting pre-recorded (or asynchronic) business case presentations to replace real time face-to-face coaching interventions. Without Covid-19, business cases would consist in industrial challenges presented in conference mode by a company worker or a start-up owner, who would have supported students until the end of the event. Normally, this type of presentations receives a lot of attention from students as they are performed in a lively and asymmetric atmosphere.

In the 'new normal' scene, the selection process was radically different. Our organization unit decided to contact as many business case providers as possible, independently of the entrepreneurial domain (as long as their innovations remained in the topic of the event). Due to home confinement, many entrepreneurs rejected our invitation since, as they explained, they did not have the conditions to participate. After contacting at least twenty national and international

entrepreneurs, eleven answered positively. Broadly related to applications in mobility, the presented business cases were recorded with Zoom, lasting an average of 25min. Thus, the activity switched from a synchronic format, in which students could normally exchange information with busines case providers, to an asynchronic version, in which classic interaction was deleted. The final product was a pre-recorded session in which the presenter was interviewed by one of the organizers.

3.3.2 Decision 2: Offering online training sessions

The second decision consisted in offering online coaching sessions instead of presential classes. Normally, experienced coaches are hired to train students in the field of innovation and entrepreneurship, using their own methodology. In these training sessions, instructors strive for highly interactive discussions with students while participants have the possibility to interact among them effectively. In a normal context, students and coaches could maintained flexible discussions at lunch breaks, for example. Contrarily, in the new normal, training sessions changed drastically. Interactive discussions were limited since most training sessions adopted a monologue style. From a contractual perspective, the organization decided to change the contract terms and ask the already hired coaches to offer online lectures (without knowing whether they had enough experience behind the camera). Despite the dead-end request, coaches decided to take the challenge and perform, with the support of the organizing team, in the new scene. Finally, the online courses were delivered 6 hours a day via online, which led to an inevitable loss of non-verbal communication.

Loosing non-verbal communication in online contexts during the pandemic has been reported as a significant challenge for students as well as for teachers. Murphy et al. (2020), for example, have shown that lack of non-verbal communication can trigger low students' engagement in the activity or poor interactivity. From the side of instructors, the online learning context gets particularly challenging as it often turns 'faceless' when participants turn off their cameras (Alawamleh et al, 2020). This loss of non-verbal meanings may have an impact on the psychological closeness between the student and the teacher" (Khalil et al., 2020: 8).

3.3.3 Decision 3: From social events to on-line socializing activities

The third decision consisted in preparing online social events instead of presential socialization activities. In normal times, social events would have been one of the main motivations to attend the summer school. Events, such as dinner at lively restaurants and weekend tours around the hosting city, would have allowed students to do networking and obtain information about potential European universities to finish their master's degrees. In the context of Covid-19, these social events had to be replaced somehow. The management team decided to organize three online social events in which participants had the opportunity to play a game and solving trivia while socializing with other classmates at the end of the coaching sessions. In order to minimize the negative impact on students, social events were thought to last no more than one hour.

3.3.4 Decision 4: Choosing technology solutions

Finally, the fourth decision consisted in choosing the most convenient and practical technological solution (communication platforms) for administrating the learning activity. In normal times, platforms were not part of the activity, not even for sharing information. In fact, information was shared through highly elaborated brochures that contained all planification details. In the reformulated version of the summer school, a technological platform had to be used to administrate the online lessons and share content. After revising several alternatives, Zoom was chosen for training sessions, mainly, because of its simplicity and its 'breaking room' option, which allowed students to work in groups in separated spaces. For organizing content and ask for deliverables, Moodle was chosen, mainly, because it was highly intuitive for both students and instructors. Other platforms, such as Teams, were discarded by the organization as they did not seem rather intuitive at a first glance.

3.3.5 Decisions' assessment via didactics and pedagogics

The assessment of the four managerial decisions were explored through didactics and pedagogics. From the didactics dimension, we explore how the interrelation between students' prior knowledge and students' new knowledge may play a role in the assessment of the summer school activity. Prior knowledge, on the one hand, is understood as knowledge acquired before the summer school and it has been explored according to three categories: *academic background*, i.e., knowledge acquired by students through their former university training; *professional background*, i.e., knowledge acquired through professional working experience; and *personal background*, i.e., knowledge based on personal interests or preferences. On the other hand, the role of new knowledge in the assessment of the summer school event was explored through the assessment of lectures or training sessions. From the pedagogical dimension, assessment is explored through student's experience according to the main structural components of the activity: pre-recorded business cases, online teaching, social events, and technological solutions.

3.4 Analysis of data

In order to understand the impact of decisions in the students' experience, we develop the following methodology to collect and analyze data. The 26 students, after completing the summer school, had to answer two complementary surveys whose main purpose was to identify how they assessed the activity[3]. Including open-ended qualitative questions, the first survey aimed to collect data about the learning experience (i.e., use of online educational resources and collaborative work). The second questionnaire, including quantitative questions using a 5-point Likert scale (1: Very Poor, 2: Poor, 3: Fair, 4: Good, 5: Excellent), aimed at collecting specific evaluations about the event, such as content, program and organization. Average grades were calculated to exploit the responses provided by the students through the Likert scales. The analysis of qualitative data consisted of a codification process conducted, iterated and revised by the three authors. Each code allowed us to identify discursive evaluative patterns and interpret our results (Saldaña, 2016). For quantitative data, we conducted descriptive statistics mainly to calculate mean scores from the Likert scales.

[3] The surveys can be downloaded as supplementary material from https://drive.google.com/drive/folders/1mh4Z1q9U5IlukSiEXUQgs6njX6cb-QDA?usp=sharing

4. Results and discussion

The assessment of the shifted-to-online Summer school was collected through students' perception of gained and lost value, which was explored through the dimensions of didactics and pedagogics. Table 1 includes a synthesis of the main results according to the four decisions taken by the organization and the corresponding assessment carried out by the participants.

Table 1. Decisions, reformulation, and students' assessment according to didactics and pedagogics dimensions.

Decision	**Main reformulations** (x -> y)	**Users' assessment (selection)**	
		Didactics: prior and new knowledge	**Pedagogics: Experience**
1: Reshaping the business cases	Professionals from the industry, presenting in synchronic mode -> Varied pre-recorded business cases administrated asynchronically	Students, either with technical or social backgrounds, assessed positively certain types of business cases, i.e., environmental-related cases with concrete applicability.	In general, participants assessed the pre-recorded business cases neutrally, although some participants evaluated them negatively, arguing that there were cases that did not have a clear relationship with the overall topic of the summer school.
2. Offering online training sessions	Instructors hired for offering synchronic classes -> Change of contract terms, pushing coaches to teach online classes instead of face-to-face sessions Interactive discussions between instructor and student in and out of the classroom -> Disappearance of lively discussions in the online modality	Academic and professional backgrounds helped CS to "analyze technical questions", decide the "feasibility" of a project", and use "standard techniques and diagrams to understand the market". SS students explained that their academic background helped them think in a relational way, e.g., identifying stakeholders involved in innovation projects.	Pitch training sessions, which relies heavily on nonverbal communication, was negatively assessed by students. Online sessions were assessed negatively in terms of workload (classes were held from 9am-4pm).
3. From social events to on-line socializing activities	Socialization events, such as evening dinners and weekend visits -> Online games and cultural visits	Social events were assessed neutrally. Based on their academic experience, students expected to achieve a high level of interaction with their mates.	Short duration of events was positively assessed by students. However, if coaching sessions did not finish on time, social events were considered to exhausting and were negatively assessed.
4. Choosing technology solutions	No technological solutions for administrating sessions or sharing information-> Use of technological platforms (Zoom / Moodle)	Given their academic backgrounds, students assessed positively the use of Zoom and Moodle.	Students were pretty confident about the use of the platforms. However, CS students missed interaction elements of the physical version. Zoom and Moodle did not fulfill all students' needs. So, alternatives were found by themselves to share documents and to keep a more fluent communication (WhatsApp, Facebook Messenger, Telegram, Google Drive).

4.1 Assessing the reshape of business cases

In this subsection, we describe how the assessment of the decision about *Reshaping the business cases* accounts for gained and lost value from the perspectives of didactics (knowledge) and pedagogics (learning experience).

The reformulation of the business cases activity and the corresponding assessment by the students allowed us to identify a typology of projects (Figure 1). As can be observed in Figure 1, the cases, that had to be watched and ranked by the students, were located in a specific quadrant according to the configuration provided by the two axes *environmental orientation* and *practical application*. Thus, 'Conscious' [+practical, +environmental oriented] includes Wipsea, Wi6Labs, YoGoKo, Car Free-Floating, and Panga; 'Operative' [+practical, -environmental oriented] includes Vipo, DriveTrust, Imagine and Keolis; 'Offering' [-practical, -environmental oriented] includes Rudi; and 'Inviting' [-practical, +environmental oriented] includes Fabcity. From a descriptive point of view, Conscious BCs are specially focused on environment and energy-saving issues; Operative BCs aim at solving a practical problem of the market; Offering BCs make data available for creating original projects; and Inviting BCs encourage entrepreneur enthusiasts to participate in public city challenges.

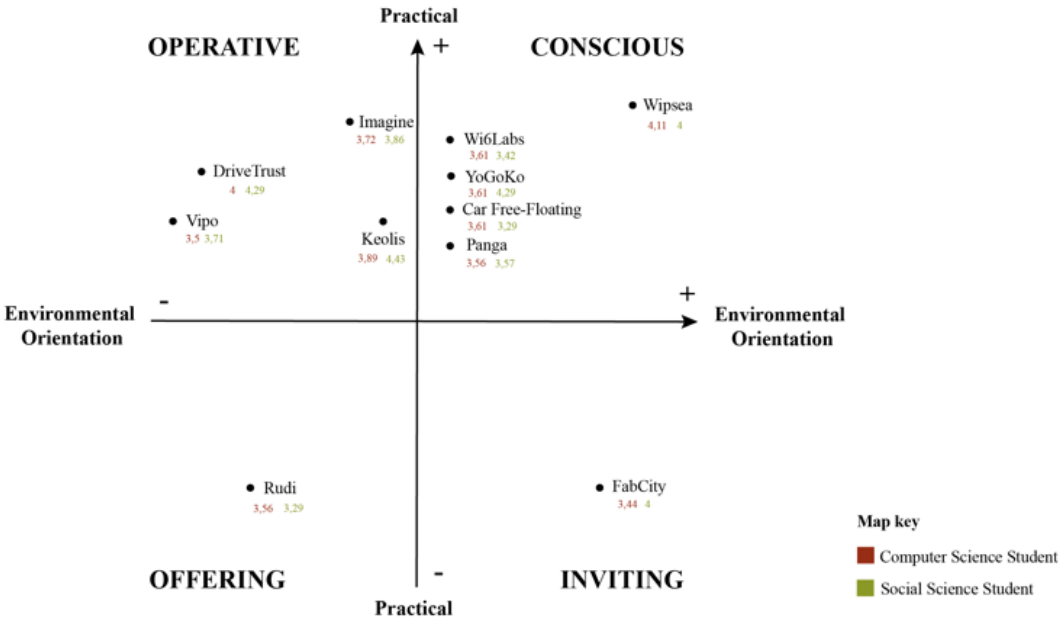

Figure 1. Typology of business cases according to their environmental orientation and practical application features. Conscious [+practical, +environmental oriented] includes Wipsea, Wi6Labs, YoGoKo, Car Free-Floating, and Panga; Operative [+practical, -environmental oriented] includes Vipo, DriveTrust, Imagine and Keolis; Offering [-practical, -environmental oriented] includes Rudi; and Inviting [-practical, +environmental oriented] includes Fabcity. Each business case includes the average score from the Likert scales according to type of student (CS or SS).

4.1.1 Didactics

Students' prior and new knowledge, as well as personal interests, were decisive to assess the quality of business cases. For example, CS participants, with an engineering background, were inclined to offer a positive evaluation, specifically, towards cases targeting everyday and environmental challenges through artificial intelligence. As observed in Figure 1, CS students tended to judge almost all of them in terms of 'fair' to 'good' (3-4 in the Liker scale), except for DriveTrust and Wipsea, which were assessed from 'good to excellent' (4 and 4,1 respectively). Being an Operative BC, DriveTrust, a dash-camera that identifies drivers' behavior behind the wheel, may have been positively valued since it involved people's safety issues. As a CS student stated, *I'm really interested in improving safety while driving*". "Citizenship concern" may also explain why CS students positively assessed Wipsea, a Conscious BC which, through artificial intelligence, recognizes wildlife in urban zones for preservation purposes.

The perception of value among students with a background in social sciences (SS) differed from that of their engineering counterpart. Although SS participants also assessed Wipsea (4) and DriveTrust (4,3) positively, the reasons evidently changed. As for the latter, for instance, one of the students referred to its clarity, claiming that "*DriveTrust was very practical and accessible, even for me who have no technical background*". Another Operative technology positively assessed by the SS students was Keolis (4,4), the business case provider in charge of the public transport in several cities across Europe. Similar to DriveTrust, which targeted security issues, Keolis was positively assessed on the basis of a potential impact on students' life. As one SS student stated, "*Keolis is about an everyday-life topic, that is to say transportation. Something necessary and not to be left, and something that needs to be improved to have a better ecosystem*". This preference for Operative projects with an evident "social impact" was, of course, reflected in the assessment of Conscious projects, such as YoGoKo (4,3), a BC which mainly consisted in explaining how citizens could improve city transport flux by providing data. Besides Conscious and Operative BCs, SS students also valued positively the Inviting BC, Fabcity. While CS students showed no enthusiasm about this proposal (the lowest score, with 3.44), SS participants got positively engaged with it probably because most of the challenges presented were related to everyday topics that matched their academic or professional interests, for example, how the city trash could be collected more efficiently.

The analysis of the assessments also revealed results in which background was not decisive. For example, although Conscious BCs were expected to be positively evaluated, SS and CS participants felt no affinity with Wi6Labs, Car-Free Floating and Panga. Wi6Labs and Panga, both BCs explaining the potential of IoT technologies for solving energy consumption issues, were assessed neutrally, maybe because they mostly referred to the technology rather than its applicability. This technology-focused description could explain why the Offering BC, the open data platform Rudi, was assessed neutrally by the participants (3.6 and 3.3, by computer science and social science, respectively). Rudi, unlike the other BCs, referred to the potentialities of the platform for developing technical solutions, but no impact on people's life was described. An alternative explanation for the low perceived assessment would be its context-dependency (it shared data about the French city of Rennes), which could have prevented international students to feel more engaged with the case.

4.1.2 Pedagogics

From the pedagogical dimension, students tended to assess pre-recorded business cases neutrally. However, some participants expressed disconformity regarding the topics covered by the business cases, arguing that some of them were not related to the overall subject of the summer school, i.e., Unleashing the Power of Circular City Data ("*A huge difference in the name of the course and what I found in the brochure before enrolling led me to think that the course was focus mainly on creating a link between technologies and policies applying it to cities. The course had a totally different thematic good also, I learned a lot, but it differs from my initial expectations"*). Indeed, the decision of including a wide variety of cases, ranging from highly applied technologies to open-source data bases, was mainly based on professionals' availability during the pandemic crisis.

4.2 Assessing online training sessions

In this subsection, we describe how the assessment of the decision about *Offering online training sessions* accounts for gained and lost value from the perspectives of didactics (knowledge) and pedagogics (learning experience).

4.2.1 Didactics

In the normal edition of the summer school, students work in groups in solving a social challenge brought by experts from the industry. In the reformulated version, workgroups were made up of students coming from the different disciplines to assure a certain level of heterogeneity. Despite participants' discipline of origin, it was possible to observe that perception of value depended heavily on their academic background. For example, our analysis showed that CS students claimed that, along the online summer school, their expertise allowed them to assess the technical specifics of a given project while social science students declared that their former training allowed them to have a "general view" of a given innovation project. CS students explained that their previous courses, as well as their professional experience in some cases, helped them to "analyze technical questions", decide the "feasibility" of a project, apply the "technical expertise to another field", use "standard techniques and diagrams to understand the market" and put into practice "design thinking". SS students, on the other hand, explained that their former academic background helped them to "think about the other stakeholders involved in the projects", "use soft skills to quickly grasp the unknown contexts [in relation to hypothetical scenarios]", "present and brainstorm in the creation process", and "work under pressure".

Interestingly, as can be observed through language use, perceived value accounts for two kinds of prior knowledge: a technical-oriented knowledge as it was the case of computer science students and a social-oriented knowledge as it was the case of social science students. Students' technical-oriented knowledge was enhanced at their respective universities and through specific courses, such as 'Business Labs' and 'Innovation and Entrepreneurship' courses (I&E). This prior knowledge helped CS participants assess their participation through a wider range of technical term, for example, "pivoting" ("*I learned from former I&E courses that teams should not be afraid of pivoting early -- Being too attached to your initial idea prevents a lot of opportunities*").

4.2.2 Pedagogics

The learning experience was mainly assessed by participants in relation to coaches and classmates, courses in general, and thematic training sessions. As for the former, students assessed professors' commitment, joy, and homogeneity. As for commitment, for example, one student claimed that "*Coaches were awesome. I did not expect that level of involvement in our projects. That was nice*". Regarding joy, students, probably having the physical version in mind, expected amusing and relaxing activities, as stated in "*I thought it wouldn't be tiring, was supposed to be a lot of fun while studying and doing a project. And the reality is we are going to build up our project from day 1 with intensive sessions every day*". The remark about "intensive sessions" referred to the fact that coaches did not give students the possibility to conduct autonomous work; instead, professors lectured from 9am until 16pm, only with a lunch break (situation which could have led to dissatisfaction in relation to sessions' durability, as reported by Rafi, 2020). As for homogeneity, participants, specifically CS students, expected to find mates with a similar engineer background as in "*I did not expect most of the people from my team were from outside EIT. Many of them did not have technical scientific background, so it was difficult for them to participate*". When assessing classmates, it was possible to find identity *clashes* among those with or without technical background as in the following comments: "*Most of the team members did not have a technical background, so it was difficult to communicate some of the ideas*." or "*I did not expect most of the people from my team were from outside EIT. Many of them did not have technical/scientific background, so it was difficult for them to participate*".

As for courses in general, CS and SS participants showed positive, although slightly different, kinds of assessments. Some CS students, for example, appreciated new knowledge according to practical purposes as can be observed in the following statements: "*I discovered some new aspects of entrepreneurship that would be useful in the future*", "*Personally from the summer school I am taking away lots of technical tips and tools which I could use to start a start-up as successfully as possible*". Thus, students valuated the summer school courses based on an entrepreneurial projection. Unlike computer science participants, socials appreciated the courses from a novelty perspective as can be observed in the next statements: "*new skills in regard to Business Management and administration*" and "*It was fun to learn about the steps of developing a business idea*". Regarding the relation between "interest" and "prior knowledge", Tobias (1994), for example, found that students with little knowledge on a certain field were likely to have the highest interest in novelty. This could explain why SS referred to learning aspects rather than business projections, as it was the case of computer science students.

Thematic training sessions, the devices for producing new knowledge, were highly appreciated by participants. The best valued training session, by both types of students, was 'Definition of a value proposition', which broadly consisted in presenting the main characteristics of a potential technological solution. Despite the general positive assessment, there were a couple of courses that led to some disagreement: 'Training for intermediate presentation' and 'Public presentation and pitch'. These sessions aimed at providing students with the necessary skills to communicate their entrepreneurial projects. While socials highly appreciated the contents (4.1 and 4 respectively), computer science students showed little enthusiasm (3.7 and 3.8 respectively). It is difficult to find a reason to explain this 'clash' among participants, but one possible cause could be related to the proximity that the course had to their expertise.

4.3 Assessing online socializing activities

In this subsection, we describe how the assessment of the decision about *Offering on-line socializing activities* accounts for gained and lost value from the perspectives of didactics (knowledge) and pedagogics (learning experience).

4.3.1 Didactics

Social events tended to be well assessed as shown in the following comments: "*Scape Game was fun, it allowed us to communicate with students from the other teams that we don't see very often"*. Despite communication was a positive value, students, based on their former academic experiences, still expected to achieve a high level of interaction with their mates as indicated in the next comment: "*it is difficult to achieve the same level of interaction online as in real life*". This claimed physical preference is interesting since it raises the question about their social purpose. Based on our experience as organizers, we argue that summer school social events are not about working in teams or solving a problem collaboratively but about making social ties and networks to draw on in their second year of Masters.

4.3.2 Pedagogics

The learning experience in online social events is clearly different from the physical one and, as such, it was judged in particular ways. Although socialization activities tended to be positively assessed (normally, between 3 and 4), there was one event that was poorly evaluated, with 3.1 and 2.2 from SS and CS participants, respectively. Regarding this result, two interesting facts could be observed: firstly, the event took place after a long pitching session that finished over scheduled time. This situation, which, by the way, led to a low evaluation of the course itself, may have predisposed students to assess the social event poorly. Secondly, judgment may depend on the type of student. In this case, engineers were quite severe as they rated the event as 'poor' while external socials, on the contrary, were flexible enough to rate it as 'fair' (meaning it was neither perfect nor terrible). This difference may be due to computer science students had higher expectations about the course since the summer school was part of their formal Master curriculum.

4.4 Assessing of technology solutions

In this subsection, we describe how the assessment of the decision about *Choosing technology solutions* accounts for gained and lost value from the perspectives of didactics (knowledge) and pedagogics (learning experience). The shift to a fully online Summer School created the need for virtual spaces for collaboration. We have decided to base our online summer school activities on two platforms: Zoom, for lectures; and Moodle, for organizing content, sharing material and giving information. The assessment of these tools by the students provided us with a view on the effects of decisions.

4.4.1 Didactics

Given their academic backgrounds, CS and SS students assessed positively the use of Zoom and Moodle. Most of the participants had experience in working both with Zoom ("*I was using Zoom before the Summer School, that's why I did not have much technical issues*") and Moodle ("*I've been using Moodle in the university for several years now, so I'm familiar with Moodle"*).

4.4.2 Pedagogics

From the learning experience point of view, students assessed the selected technologies in multiple ways. Regarding the use of Zoom for lectures, both CS and SS students assessed the platform in positive terms as they felt pretty confident with the technology. Evaluations, however, changed drastically when it came to "teamwork". While socials were quite satisfied with Zoom for working with peers (4.6), CS participants were more critical (3.5). As can be observed in the next comments, one common trigger of dissatisfaction among students was related to the fact that they missed certain interaction elements of the physical version, such as meeting people from other groups ("*there was no problem with teamwork and coaching on zoom although we couldn't interact much with people outside our group*"), watching people's expressions ("*of course it is not like real life so unfortunately for the coaches, it was difficult to see our reaction, even us when we present, we cannot see the reactions*"); and networking ("*although I think in general the whole experience was positive, I was missing some face to face networking and interaction after the sessions*"). According to Koh and Hill (2009), social interactions play a valuable role in group work, impacting students' perceptions about the learning experience. Thus, the lack of social interactions, at least as expected from presential contexts, would explain why engineer students showed lower levels of satisfaction with respect to the platform use.

From the technical perspective, participants experienced connection problems, but it is worth noting that problems were not as critical as those identified by Dube (2020) since students' contextual realities were completely different. Indeed, as a major concern, participants referred to the fact that, once they left a breakout room for some reason, it would not be possible for them to join the session again without the permission of the teacher, which often resulted in long dead times ("*Although the only tiny thing is that sometimes when we are assigned to breakout rooms and quit by accident, if the teacher is not in main room then we have to wait a lot to be resigned*"). Although expressed as "tiny", the problem with Zoom breakout rooms may have negatively impacted student's e-learning experience. As observed by Wentling et al. (2007), technical difficulties in online settings can have a negative effect on learners' satisfaction, which was reflected in the 3.5-score obtained from computer science students.

Regarding Moodle, this platform was generally assessed in positive terms, probably, because it turned out to be quite familiar to the students, as shown in the next comment: "*I've been using Moodle in the university for several years now, so I'm familiar with Moodle*". Moodle performance, it is worth noting, depends on how the different functions have been set up. The Assignment resource, for example, was negatively assessed because of a misalignment among professors when collecting students' tasks, as can be observed in the comment "*I do not really feel that the Moodle was really useful, (...), some teachers preferred that we send the work by mail, but others used the Moodle repository".* This perceived lack of coherence in the way professors used

the platform features is interesting as it is an assessment that would be rarely formulated in relation to the presential version. In fact, in the face-to-face version each professor decides, along with their students, the most convenient method to collect the assignments, which, by the way, can change from one day to another depending on the dynamics. Thus, it can be deduced that whenever there is confusion about what is required by teachers, as reported by Dick (2005), it is highly likely to lose value.

Another interesting result is related to the fact that most participants were pushed to find other platforms to fill some of the 'digital gaps' of the Moodle platform, for example, to exchange and store documents easily ("*In our group we used Google Drive which is practical to share our work*"). As noticed in the former comment, Google Drive was highly regarded by the participants as the best tool for filling the digital gap, assessed with 4.9 by socials and 4.5 by engineers. When asked if they used another communication tool, participants revealed that they used WhatsApp, Telegram and even Facebook Messenger, which reveals how important is to maintain a social proximity among teammates. The relevance of these tools, specifically Google Drive and WhatsApp, was reported by Moreno et al. (2020), who found that the use of these technologies in teaching-learning settings encourages active learning, increases motivation, and, besides, mixes elements of instruction with other interactive elements (e.g., visual and auditory aspects).

As could be observed in the section, the assessment of the shifted-to-online Summer school was collected through students' perception of gained and lost value, which was explored through the dimensions of didactics and pedagogics.

5. Learning the impact of reactive decisions

In this case study research, we have generally aimed to learn about the impact of the reactive decisions taken to reformulate an educational event: an international summer school. To meet this general purpose, we have explored how students assessed the re-configurated event in relation to four managerial decisions: a) preparing pre-recorded business case presentations; b) offering online coaching sessions; c) preparing online social events; and d) defining the most convenient technological solutions. The analysis of the managerial decisions allowed us to identify some tensions or paradoxes mainly in relation to *belonging* and *performance* (Smith and Lewis, 2011) between organization and users. Here, a synthesis of the main organizational learning in terms of the paradoxes at stake:

a) The assessment of the first decision related to pre-recording business cases helped us learn about identity and performing paradoxes. Regarding the former, it is worth noting that pre-recorded business cases, consisting in projects including IoT or artificial intelligence, were included in the activity to target student's disciplinary background. However, participants assessed business cases according to personal interests that could not be anticipated by the organization, e.g., solving environmental and everyday issues. This identity tension might be generated since the user was considered as a "student", not as a "citizen". In relation to the second tension, it was possible to find a performing paradox, in which the strategy to maintain the original topic clashed, in some degree, with the business topics finally incorporated in the reformulation. As some users suggested, some business cases were considered unrelated with the overall topic of the summer

school. This tension was because of the case portfolio was finally conformed based on providers' availability during the pandemic crisis.

b) The assessment of the second decision related to the online training sessions helped us learn that the inclusion of students with different academic background generated *identity clashes* among participants. For example, CS users claimed that it was difficult to work with classmates having no "technical or scientific background". Also, it was possible to find *performing* tensions regarding the goals of participants: CS students took the summer school with the purpose of developing a business projection while SS participants took the summer school to learn new concepts.

c) The assessment of the third decision related to social events accounted for two important *performing* tensions among participants. On the one hand, the organization considered social events as opportunities for students to meet new friends. With this in mind, games and trivia were offered. In a normal context, however, social events are not just for "meeting people", but to do strategic networking as we learned. This performing tension led students to think of social events as one more task to finish at the end of the day.

d) Lastly, the assessment of the fourth decision related to the technical solutions allowed us to identify, among other aspects, that the technologies chosen by the organization did not fulfil all students' needs. This performing tension led participants to find alternative means (additional apps) to keep a more fluent communication with their partners.

To conclude, these results allow us to learn to organize future summer schools, whether in person or online editions. The acknowledgement of different organizational issues, such as management of participants' interdisciplinarity, identification of pedagogical content that should or should not be developed asynchronously, motivations of students regarding the topics of their interest, as well as the distribution of work supervised or autonomously, will allow us to design future educational events in the light of what we have learned after the urgent need to reformulate our work as educators.

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