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Entrepreneurial decision making in a microcosm

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Management Learning

Entrepreneurial decision making in a microcosm

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Keywords:	microcosms, entrepreneurship education, live projects, causation, effectuation, bricolage, cognitive logics
Abstract:	<p>This study investigates when, how and why students use causation, effectuation and bricolage behaviours within a fundraising project that acted as a microcosm of the entrepreneur's world. Such a pedagogical device reveals students use of different OM behaviours over the different stages of entrepreneurship. Although research has confirmed the use of these behaviours by entrepreneurs, how student entrepreneurs learn, and practice, them, remains underexplored. Causation is the predominant focus for university teaching, yet our data reveal that students adopted all three behaviours at different stages of the fundraising project as they responded to different contextual forces. Our findings suggest that opportunity management theories should take a more prominent role in the higher education entrepreneurship curriculum. Educators also need to provide a better means of facilitating students to learn about, and practice, a greater repertoire of opportunity management behaviours than is currently the case.</p>

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Entrepreneurial decision-making within a microcosm

Abstract

This study investigates when, how and why students use opportunity management (OM) behaviours (causation, effectuation and bricolage) within a fundraising project that acted as a microcosm of the entrepreneur's world. Such a pedagogical device reveals students use of different OM behaviours over the different stages of entrepreneurship (Chang et al 2014; Gibb 2002; Rasmussen 2011). Although research has confirmed the use of these behaviours by entrepreneurs, how student entrepreneurs learn, and practice, them, remains underexplored. Causation is the predominant focus for university teaching, yet our data reveal that students adopted all three behaviours at different stages of the fundraising project as they responded to different contextual forces. Our findings suggest that opportunity management theories should take a more prominent role in the higher education entrepreneurship curriculum. Educators also need to provide a better means of facilitating students to learn about, and practice, a greater repertoire of opportunity management behaviours than is currently the case.

Key words: opportunity management, entrepreneurial cognitive logics; causation, effectuation, bricolage; entrepreneurial learning, microcosms,

Introduction

This paper explores when, how and why, undergraduate entrepreneurship students on a business-management degree use different opportunity management (OM) behaviours (causation, effectuation, bricolage) in a fundraising project that acts as a microcosm of the challenges faced by entrepreneurs over time (Gibb, 2002). In this paper we use the term

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3 opportunity management rather than opportunity recognition, discovery, or creation (Miller
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5 2007; Alvarez and Barney, 2007) as it encompasses both the identification and conversion of a
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7 potential opportunity into something valuable. We are aware that other authors have used the
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9 terms decision-making or cognitive logics (Reymen et al., 2016; Dutta and Thornhill, 2014) to
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11 describe a combination of entrepreneurial intentions and behavioural outcomes. It is beyond the
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13 scope of this paper to disentangle these differences; instead we simply use the term opportunity
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15 management to encompass both the cognitive underpinnings *and* actual behaviours.
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20 The best way of preparing university students for entrepreneurial careers has been the subject of
21
22 energetic, and increasing, debate in a number of literatures (Fayolle, 2013; Gielnik et al., 2015).
23
24 What they should be taught, or should learn to do, ideally ought to prepare them for becoming
25
26 entrepreneurs. Historically causation has been presumed to be the default behavioural logic that
27
28 entrepreneurs use (Matlay, 2008). Causation refers to where an entrepreneur decides on a
29
30 predetermined goal and then selects between means to achieve that goal, a process that involves
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32 formal planning based on competitor and market analyses (Sarasvathy, 2001; 2003; Fisher,
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34 2012). However, it was increasingly recognised that actual entrepreneurs often do not do this,
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36 and certainly not to the extent that some had presumed. Hence subsequent theorising on
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38 entrepreneurial decision-making identified effectuation, in which decisions are based on the
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40 identification of means which are subsequently applied to suitable entrepreneurial
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42 opportunities, and bricolage, in which neither existing means nor predetermined goals set the
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44 entrepreneur's path, rather it is a process of 'making do' with whatever is at hand (Fisher,
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46 2012).
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53 These are therefore the behaviours and skills that students leaving higher education should have
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55 learnt. However, there is evidence that this is not what is happening. In parallel with increasing
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3 knowledge about what entrepreneurs actually do, there is increasing awareness of the
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5 limitations of entrepreneurship education which has tended to focus on the teaching of
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7 causation and not effectuation and bricolage. In this paper we reveal when and why students use
8
9 effectuation, causation or bricolage when they are immersed into a microcosm of a ‘real-life’
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11 entrepreneurial task, fundraising for a social enterprise in a resource-constrained environment.
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13 This is in order to identify the contextual imperatives that shape the adoption of the different
14
15 OM behaviours and thereby provide a more nuanced understanding of the learning needs of
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17 entrepreneurship students. Our longitudinal qualitative data captured the students’ journey over
18
19 time as they described and critically reflected on what they had done and why they had done it
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21 (Welter et al., 2016).
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27 Our aim is to expose the contextual influences on students’ behaviour, and changes in their
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29 behaviour, in order to help educators facilitate students’ learning about the appropriate use of
30
31 the different behaviours (Arend et al., 2015; Brettel et al., 2012; Chandler et al., 2011; Fisher
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33 2012; Perry et al., 2012; Senyard, et al., 2015). We are able to provide insights as to why
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35 effectuation and bricolage, as well as causation, should form a stronger part of entrepreneurship
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37 education. For example, when entrepreneurs are working in a time-unconstrained, and
38
39 predictable situation, causation is an appropriate behavioural choice (Sarasvathy, 2001). In a
40
41 time-pressured, stressed and risky context, effectuation and bricolage are useful (Fisher, 2012;
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43 Perry et al., 2012; Welter et al., 2016). Educators need to understand this in order to guide
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45 students appropriately, and to provide them with the means to acquire the skills and knowledge
46
47 that will allow them to make good behavioural choices.
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53 The structure of this paper is as follows. First, we review the literature on OM behaviours and
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55 the use of live projects as a microcosm in entrepreneurship education. This is followed by a
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3 discussion of the methods used to collect and analyse our data. We then unfold the students' use
4 of different OM approaches within the fundraising projects. The conclusion summarizes the
5 contributions of this article to entrepreneurial learning and the role of microcosms in
6 entrepreneurship education, and suggests areas for future research and practice.
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12 **Entrepreneurial decision-making**

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16 The management of opportunities is a core problem for entrepreneurs (Mair and Marti, 2006).
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18 The original construct, causation or 'rational' theory, is an economics-based approach in which
19 entrepreneurs discern an opportunity and then follow a normative decision-making process to
20 exploit it (Hindle, 2004). By collating essential information, they systematically evaluate
21 choices (Alvarez and Barney, 2007; Miller, 2007) and assemble any necessary resources
22 (Lanivich, 2015). A subsequent development of the theory was the defining of 'effectuation'
23 (Sarasvathy (2001, p245) as a decision-making process that does not begin with a specific goal
24 ... "instead, it begins with a given set of means and allows goals to emerge contingently over
25 time from the varied imagination and diverse aspirations of the founders and the people they
26 interact with, bringing in his or her skills, resources, people, and networks". Effectuation is
27 means-driven, as opposed to the goal-driven causation. Effectuation original five principal
28 components: 'bird-in-hand', "affordable loss", "lemonade", "crazy-quilt" and 'piloting the
29 plane' (Sarasvathy, 2003) were subsequently operationalized by Chandler et al. (2011) and
30 Fisher (2012) into seven categories that we used as the basis for our analysis.
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49 The most recent aspect of opportunity management to be conceptualised is 'bricolage' (Lévi-
50 Strauss, 1967), the application of new combinations of whatever resources are at hand to
51 address an opportunity that has been identified (Di Domenico et al., 2010). Baker and Nelson
52 (2005) characterize three aspects of bricolage: "resources at hand", "recombination of resources
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3 for new purposes” and “making do”. Bricolage has the additional connotations of refusing to
4 recognise, or be constrained by, existing definitions of a problem (Mair and Marti, 2006).
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8 Causation tends to be used in a flourishing or stable and predictable environment. Here
9 opportunity creation is incremental, such as the differentiation of a product where its market
10 and competitive environment are already known (Sarasvathy, 2001). Causation involves
11 identifying a gap and developing a plan to address it (Alvarez and Barney, 2007; Sarasvathy,
12 2003). Effectuation is more common in situations where the future is unknowable and
13 unmeasurable. Effectuation’s principles (Sarasvathy, 2001) are to find the means to adapt
14 resources and create new opportunities (Welter et al., 2016) as well as reducing complexity in
15 an environment that is lonely, uncertain, and full of risk (Gibb et al, 2013). Bricolage, which
16 has been less researched than the other two categories, tends to be found in conditions where
17 resources are especially scarce and penurious, and uncertainty-based risk is higher (Senyard et
18 al., 2015; Welter et al., 2016). These conditions are particularly common in the case of business
19 start-ups in a new field (Beckett et al, 2015; Fisher, 2012). There is a growing literature on how
20 entrepreneurs respond to resource adversity through the use of bricolage but little work to date
21 has been done on the competences or skills necessary to use bricolage effectively (Baker et al.,
22 2003).
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43 As theoretical constructs, causation, effectuation and bricolage have some critics (Arend et al.,
44 2015) who suggest that each element remains to be fully developed conceptually. A number of
45 scholars have criticised the OM categories as being rather repetitive and overlapping (Welter et
46 al., 2016), and recommend further refinement of the categories. Bricolage appears especially
47 problematic (Baker and Nelson 2005; 2012; Welter et al., 2016). Given this lack of clarity it can
48 be difficult to understand what aspects of the different concepts are used, and whether they can
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3 be used sequentially, or even simultaneously, to address specific aspects of the entrepreneurial
4 decision-making process (Laine and Galkina, 2017).
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8 However, increasing numbers of scholars are examining their use (Welter et al., 2016; Fisher
9 2012; Mäkimurto-Koivumaa and Puhakka, 2013) and finding that entrepreneurs use a range of
10 different decision-making logics to deal with the creation of a new venture under conditions of
11 uncertainty (Baker and Nelson, 2005; Dew et al., 2015; Fisher, 2012; Read et al., 2009
12 Sarasvathy, 2001). One of the important inputs into decision making generally, and this holds
13 true for entrepreneurs as well, is the role of experience (Sarasvathy, 2001; Wiltbank et al.,
14 2006; Dew et al., 2009). Experience leads to the development of decision-making heuristics,
15 which shape behaviour (Fodor and Pinteá, 2017. Fodor, et al., 2016). Foo et al., 2015; Delgado
16 Garcia, et al, 2015). Bad experiences can leave psychological 'scars' which steer the individual
17 away from using the same decision-making logics, even if it would be an appropriate strategy in
18 different circumstances; in contrast, positive experiences can lead to the same behaviour being
19 repeated, even if it would be ineffective in the new circumstances. However, few studies have
20 examined how entrepreneurs decide which logic to use (Salusse and Andreassi, 2016; Williams
21 et al., 2014) or how entrepreneurship students are taught which are the most appropriate. An
22 awareness of these gaps underpinned our study.
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44 **Entrepreneurship education**

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46 Research suggests that university entrepreneurship programmes have had mixed success in
47 developing students for an entrepreneurial career (Fayolle, 2013; Nabi et al, 2016; Souitaris et
48 al., 2007). We know that enterprise education has expanded in terms of what is being taught,
49 from a narrow focus on what entrepreneurship *is*, often centred around traditional business
50 school teaching, to include training *for* entrepreneurship and finally to encompass experiential
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3 and existential aspects of enterprise education in learning *through* entrepreneurship. However,
4 this has “not been adequately articulated either in course descriptions or in the academic
5 literature” (Blenker et al., 2015, p 134). Most have focused on identifying entrepreneurial
6 attitudes and the intention to start a business (Pittaway and Cope, 2007; Souitaris et al., 2007)
7 and not on learning ‘entrepreneurialness’.
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15 Despite the increasing awareness of the entrepreneur’s actual behaviours most entrepreneurship
16 degree programmes appear to offer little in the way of teaching students about the appropriate
17 use of these behaviours (Fayolle et al, 2016; Nabi et al., 2016) and is still heavily focused on
18 causation (Kickul et al., 2010; Matlay, 2008). In parallel there is increasing criticism of the
19 didactic classroom-based approach to teaching entrepreneurship and increasing recognition of
20 the benefits of live projects or microcosms (authors, 2013; Fayolle 2013; Neck et al., 2014;
21 Welter et al., 2016). Especially relevant for our study, Corbett (2005) found that action learning
22 is a useful means for students' to discern and act on opportunities and reflect on critical
23 incidents, resulting in higher levels of entrepreneurial awareness (Lindh and Thorgren, 2016).
24
25 We acknowledge that there are many differences between a microcosm and real
26 entrepreneurship: raising funds is only one of the many activities that entrepreneurs have to
27 undertake, such as management of employees, business growth, product development etc. It is
28 also much more risky and complex in terms of financial investment, personal reputational loss,
29 and the opportunity costs that have to be balanced. However, given the constraints of the higher
30 education context, the microcosm provided a simulacrum that was as close as possible to real
31 life and which allowed us access participants’ learning and development as it happened in real
32 time (Kassean et al., 2015; Rasmussen et al., 2006) and explore how, when and why the
33 different OM behaviours were used (Baker and Nelson, 2005; Fisher, 2012).
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The microcosm as a pedagogical device for entrepreneurial learning

The live project that we used to assess students use of the different OM behaviours, fundraising for a social enterprise, provided a microcosm, or scaled-down version, of entrepreneurial activities (Kapranos, 2016). Scholars such as Souitaris et al. (2007) suggest that the challenge for entrepreneurship educators is to develop a pedagogic device that encourages the development of entrepreneurial behaviour through immersion in real rather than simulated activities (Tosey et al., 2015; Gibb et al, 2013). A microcosm has been used successfully as a tool for entrepreneurship development in order to illustrate the activities of an entrepreneurial actor in rural Bangladesh (Mair and Marti, 2006). We argue it is also suitable for entrepreneurship education, although it does not contain the five stages of entrepreneurial development (Gibbs, 2002) typically taught on entrepreneurship programmes. It has some overlap with live projects, which are well established methods of learning entrepreneurship (authors, 2014; Fayolle 2013; Neck et al., 2014) being inherently immersive (Gibb et al, 2013). However a microcosm contains specific additional features that mimic the entrepreneur's world. Souitaris et al. (2007) say it allows a change in entrepreneurial attitude or behaviour, facilitates learning of entrepreneurship, is a means of inspiring and motivating entrepreneurship, and provides incubation resources.

The question is, does a fundraising project represent a suitable microcosm of the entrepreneur's world? We believe that it does. Fundraising for a social enterprise, without prior financial resources, is an entrepreneurial process in which opportunities are transformed into value (Fisher, 2012; Welter et al 2016). There are stressors and time pressure; it provides the means for developing awareness of the effects of resource scarcity and the need to use resources as a means to control uncertainty. It encourages students to search and select, and develop unformed

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3 thoughts into valid ideas. It allows for students to develop financial plans, negotiate with
4 different stakeholders, promote their activities, and develop their ideas into larger-scale
5 operations, which they then have to implement. Such immersion involves elements of risk
6 reduction, strategic thinking, and learning under pressure.
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13 However, we know that there are differences between students working in a microcosm and
14 actual entrepreneurs that need to be factored into our theorising. For example, even though they
15 could choose their own team members, students had a relatively narrow group of people to
16 work with. Entrepreneurs, in contrast, have an existing network of established relationships
17 (Rauch et al., 2016), who provide a more stable and predictable environment. Entrepreneurs are
18 also able to choose colleagues that are culturally similar (Hardy and Tolhurst, 2014). In our
19 case conflict and relational difficulties were possible because of the internationally diverse
20 nature of the student body (Apfelbaum et al., 2014; Moreland et al., 2013). This may lead to a
21 preference for those OM behaviours that are less psychologically expensive (Grupe and
22 Nitschke, 2013). There are also quite profound differences between real entrepreneurial
23 ventures and the microcosm in the time set for the project (ten weeks vs unlimited time) and in
24 the different objectives between students and entrepreneurs (passing the course / creating a
25 successful venture). These mean that any research has to be careful in extrapolating results and
26 generalising from a microcosm to the real world of the entrepreneur. However, given these
27 limitations we nevertheless believe that the microcosm offers the best available proxy for real
28 life given the constraints of university education and its learning environment.
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51 To summarise, in this paper we are interested in a poorly-researched area, that of understanding
52 students' use of causation, effectuation and bricolage within a microcosm of the entrepreneur's
53 world. We now describe the methodology that we chose.
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Methodology and data analysis

Our intention was to understand the use of OM behaviours by entrepreneurship students in a live project that mimicked, as far as was possible within the higher education context, the entrepreneur's world (Dew et al., 2015; Lehner and Kansikas, 2012). Understanding the contextual influences on these processes, and how they change over time, requires longitudinal qualitative data and an interpretive epistemology (Gray, 2007; Jones et al., 2011).

Students were tasked with raising money for a social enterprise without any prior budget. This took place within an elective entrepreneurship module on an undergraduate business degree in a UK business school during the second year of a three-year degree programme. It lasted ten weeks. Students were not required to have any prior knowledge of entrepreneurship concepts or theory in order to join the module, although all had previously taken core business and management modules (e.g. marketing, accounting, economics). Our objectives were to enable students to be immersed in a real project, a form of "learning by doing" (Pittaway and Cope, 2007). The microcosm, as described above, would allow students to learn the skills that entrepreneurs need and also develop some empathy for the entrepreneur's world. Mentoring was provided by academic staff who met weekly with the students in order to provide feedback and discuss options. The amount of money raised was not to form part of the assessment: instead students were graded according to the quality of evidence of their activities and their reflection on their learning.

124 students participated in the module, divided into 25 teams. Each team was tasked with raising funds for one of six social enterprises that staff had pre-selected and that had agreed to make themselves available to the students (Table 1).

Insert Table 1 here:

Fundraising activities included social events, food fairs, salsa evenings, charity auctions, sales of T-shirts, computer games competitions, radio advertisements and a photo gallery competition. Each team was required to report on their progress weekly, reflecting on what they had done, and why, and what had worked and what hadn't (Lindh and Thorgren, 2016). These reflective logs comprise our primary data, onto which we subsequently mapped the CEB constructs and the contextual influences on them (Pittaway et al., 2011; Pittaway and Cope, 2007). The logs averaged between 9,000 and 10,000 words per group, about 250,000 words in total. All groups gave permission for their data to be used for research purposes. The data from the student accounts were supplemented by information from tutorials, observation of student interactions, discussions with students, social enterprises and tutors, all of which were recorded and discussed between the teaching and research team. These helped to inform the analysis and judgement of why and how students behaved as they did.

We used Fisher's (2012) scale to identify inductively indications of the use of the different OM behaviours within the logs. These emerged through a process of theme identification and interpretative synthesis (Howard et al, 2013; MacKay and Chia, 2013) rather than the positivistic application of a predetermined framework (Åsvoll, 2014; Gray, 2007). Students were not asked to categorise their behaviours; instead the authors went through the transcripts and categorise any behaviours that could be identified. They agreed on the themes and the OM behaviours identified. Where there were differences of interpretation, these were discussed and a common conclusion reached. There was no attempt to measure the degree of disagreement or inter-coder reliability ratings; all classifications were discussed and an agreed decision reached.

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3 Each behaviour was allocated exclusively to one of the CEB categories as described in the
4 findings section below. Almost all of our data could be fitted into one of the CEB categories.
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6 Behaviours which appeared to fit into two or more categories were also noted, and allocated to
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8 what appeared to be the most appropriate. This process allowed us to believe (as we discuss
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10 later) that the cognitive logics' categories need some refinement in order to remove duplication
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12 and overlap.
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18 For each instance of a particular behaviour we looked for explanations for why they had been
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20 chosen, for example the characteristics of the project environment (e.g. stable, pressured,
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22 complex), team characteristics (e.g. diverse, experienced) and group dynamics (e.g. conflicted,
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24 demotivated). In doing this we were looking for causal and moderating factors that underpinned
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26 the choice of behaviours as the fundraising project developed over time.
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30 Findings

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33 In this section we describe the ways in which students used the different categories of OM
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35 behaviours, when they used them, and what stimulated their use. We especially identify
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37 changes in behaviours as the fundraising project progressed, and differences in the behaviours
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39 in different groups. In total, nearly half of the behaviours that we discerned could be
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41 categorised as causation, a quarter could be defined as effectuation, and another quarter as
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43 bricolage, but the preference for one over the others changed over the lifespan of the project
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45 (Figure 1).
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49 Figure 1 about here

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54 We discuss in depth the reasons for these choices and the influences on any change below. For
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3 now we simply note that causation was prevalent between weeks 2 and 5 when students used
4 their learning from previous courses such as accounting, finance and marketing. Week 2 was
5 when most groups visited their social enterprise and became aware of its ethos and need for
6 regulatory compliance. Bricolage became particularly apparent at key dates later in the project,
7 as the project path turned out to be not quite as the students had predicted. Both effectuation
8 and bricolage increased over time as the students learned what worked rather than what they
9 had learned in the classroom.
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20 In the following sections we discuss in more detail the OM behaviours used, and provide
21 explanations for these choices.
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25 *Causation*

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27 In looking for indicators of causation, we based our analysis on Fisher's (2012) definitions.
28 Figure 2 shows the pattern of causation behaviours over the 10 week period. Examples of
29 students' causation behaviours are shown in Table 2.
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36 **Insert Figure 2 about here:**
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39 **Insert Table 2 about here**
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41 *Effectuation*

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43 In identifying effectuation we again looked to Fisher (2012, p. 1030) and Chandler et al.'s
44 (2011) seven categories of effectuation behaviours (Figure 3). Examples of students'
45 effectuation behaviours are shown in Table 3.
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52 **Figure 3 about here:**
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55 **Insert Table 3 about here**
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Bricolage

In looking for bricolage we looked to Fisher (2012), Chandler et al. (2011) and Senyard et al. (2009) to identify eight categories of bricolage (Figure 4). Table 4 gives some examples of students' bricolage behaviours.

Insert Figure 4 about here

Insert Table 4 about here

The influence of time on the use of the different behaviours

All categories of causation behaviours were used by at least some of the student groups each week. This reflects what might be considered the traditional teaching of entrepreneurship (Matlay, 2008) and the conventional business practices that our students had been taught, so it is no surprise that we see evidence of these behaviours. Both experienced and non-experienced groups came out with at least two ideas that had to be tested in order to assess the viability of the opportunities identified. They organized and implemented control processes to ensure that the ideas were implementable, and then the majority of the groups developed plans that detailed their ideas for revenue generation, as agreed with their social enterprise.

Causation frameworks that were derived from previous teaching (for example how to analyse financial performance or undertake competitor analyses) were used extensively. Some were linked to the timing of the task: visioning and opportunity identification were used at the beginning, but less so subsequently. Calculated returns was dominant when the students had to submit their plans, with performance predictions, to the social enterprise in week 4. Market reviews, competitor analysis and financial plans were all undertaken at the appropriate time. Control processes and project planning were used steadily throughout, suggesting that the

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3 groups believed that the environment was stable and predictable. We thought that the groups
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5 appeared to be rather on an autopilot causation course, steered by the systematic and linear
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7 approach of the entrepreneurship syllabus along with the groups' (especially the inexperienced
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9 ones') assumption that OM is linear.
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13 In terms of temporality, there were also relatively few surprises in effectuation. Adaptation
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15 behaviours, for example, were only seen after the first concepts had been developed, and
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17 agreement behaviours were seen especially after week 7 as students realised that they needed to
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19 begin to implement their ideas and that they needed to comply with the requirements of the SE
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21 and the university. Commitment of limited resources was the most prevalent effectuation
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23 category overall. Students knew they would not have a starting budget and *had* to depend on
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25 their own resourcefulness in order to succeed. Thus the early stages saw attempts to identify
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27 and muster resources, including knowledge and relational capital. In most of the weekly
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29 reflective logs, the 'no starting funds' requirement was perceived to be a challenge. However, it
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31 compelled students to assess the intrinsic resources available to the group and use creative
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33 means of achieving their goals, or what Sarasvathy (2001) termed 'bird in-hand' principles. The
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35 ideas for generating income were drawn from the experience and competence of team members,
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37 networks from present and previous work places, as well as family and 'friends of friends'. The
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39 behaviour of 'affordable loss' was also discernible, as the students thought up novel ways to
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41 limit the amount of money they needed to spend. The effectuation behaviours that prevailed
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43 between weeks 3-7 were to do with adaptation, efficiency and agreement with different
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45 stakeholders.
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53 Bricolage was not really used until the students were faced for the first time with the real world
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55 of the social enterprise during week 2. Visits to the social enterprise allowed them to access
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3 under-used resources within the organisation. In almost all cases these provided a strong
4 stimulus for change in the groups' behaviours. Bricolage was particularly prevalent near to the
5 fundraising event between weeks 8 and 10, suggesting that they were a response to what was
6 perceived as a crisis as the students needed to "improvise" to get things done.
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13 Most of the teams sought resources outside the social enterprises and were reliant on business
14 sponsors and university facilities to combine resources in order to generate income. There was
15 little evidence of the bricolage category of reuse of resources, however, or experimentation,
16 changing the product or service, and responding to unplanned opportunities.
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21 Instead, personal resources such as labour and skill inputs predominated; although these are
22 poorly conceptualised in the OM literatures they were more relevant to our students. As we
23 discuss below, there were some differences in the use of this category due to the presence of an
24 experienced student in a group.
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33 Revenue targets moderated over time, influenced by students' desire to generate more income
34 for their social enterprise. An empathetic ability to relate to the cause of the organization
35 increased over time, which stimulated an awareness that they needed to do more, and could not
36 simply coast. Once again as we discuss below, experience provided the groups with a better
37 understanding of what was possible, meaning that some groups used bricolage to catch up when
38 causation did not produce the hoped-for result.
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48 The involvement of the social enterprise also provides an explanation for what at first sight may
49 seem an unexpected finding - the complete absence of data suggesting that they worked around
50 the limitations of the institutional environment. An awareness of the social enterprise's
51 constraints, along with the requirements of the university's regulatory and assessment
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3 environment, provided a strong impetus for compliant behaviour.
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6 *The influence of experience on the choice of behaviours*
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8 We were able to identify differences in behaviours between groups with an experienced
9 member and those without. All of the groups approached the business communities around their
10 social enterprises to seek agreements for funding, although the experienced groups did better at
11 this - they knew earlier on who to approach, and to what intent. Most created Facebook
12 accounts to raise awareness of their projects among their classmates, student unions, and
13 business communities. Comments were sought from customers of the projects through social
14 media, both on the projects themselves and on how to get more resources, leading to a virtuous
15 cycle of resource acquisition.
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27 Experienced groups were especially conscious of the implications of the lack of resources from
28 week 1: they knew they would need to start early to accrue the resources they needed. Only the
29 experienced groups appeared able to combine resources and reuse resources for new purposes
30 (Groups 6 and 11). They were able to develop opportunities from the resources they observed
31 from their frequent visits to the SE, which tended to be more frequent than the inexperienced
32 groups.
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42 Groups with experienced members (e.g. Groups 5, 6 and 11) also embarked on experimenting
43 with different business models much sooner than the inexperienced groups. Group 6 went to
44 visit the SE immediately and experimented with the idea of advertising local business on the
45 radio station previously used by the SE for training its youth workers. Group 6 experimented
46 with different sales channels for its raffle - via a Just Giving page or physical distribution of
47 tickets, and Group 11 experimented with baking cookies themselves versus obtaining cookies
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3 from bakeries.
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6 Experienced groups also appeared to be able to use both causation and effectuation
7 simultaneously, such as implementing control processes for their experiments, meaning that
8 they were less conflict-ridden and more able to control their environments. They were also able
9 to employ resources such as social media much sooner, and were therefore able to reduce the
10 likelihood of an unsuccessful event. The experienced groups were able to target resource
11 acquisition at an earlier stage, typically between weeks 1-3, and more efficiently - with less
12 time spent on wasted initiatives. The less experienced groups typically started later - at week 5 -
13 and by week 10 were in something of a panic about their performance. We also observed that
14 entering into agreements to obtaining the resources they needed was a popular choice for the
15 experienced groups; the non-experienced groups were more tempted to use their own money,
16 even though this was not officially sanctioned.
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31 32 *The effects of diversity* 33

34 Diversity within the group was usually the most important factor leading to emotionally-driven
35 absenteeism, conflict, and the panicked use of bricolage at later stage of the project.
36 Confounding effects could be discerned when inexperienced *and* diverse groups were unable to
37 resolve the conflict that stemmed from diversity. For example, in the four inexperienced groups
38 (1, 15, 24, 25) where the negotiated tasks (i.e. process control) had not been completed by
39 weeks 4-8, conflict developed, leading to lack of engagement and low attendance. Group 1 had
40 unrealistic expectations. In group 15 one international student attempted to dominate leading to
41 resistance and withdrawal from the other members. A consequence was the inability to fully use
42 the internal resources that could be used as the means of achieving their goals. Eventually
43 Group 1 learned to reduce their goals and work with what they had (i.e. effectuation), and
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3 Group 15 also learnt to work with what they had (a dysfunctional dominant member) by
4 assigning different tasks to other members.
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8 In contrast diverse but experienced groups (9, 11) were able to manage the limited conflict that
9 developed through better allocation of roles as well as through the less experienced members of
10 the group being taught what they could expect. As a result, their control processes worked
11 effectively and they had less need to rely on bricolage.
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17 18 **Discussion**

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20 Our study investigated students' use of causation, effectuation and bricolage within a
21 fundraising project that provided a microcosm of the entrepreneur's world. We were interested
22 in when, and why, students used the various OM behaviours over time (Figure 5). Drawing on
23 previous process-based research, we found that the three OM behaviours adopted by students
24 during the 10 weeks were triggered by different kinds of stimulus, teleological, dialectical and
25 evolutionary (Van De Ven and Poole, 1995; Reymen et al., 2016; Rasmussen, 2011).
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36 Insert Figure 5 about here
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39 Each of these stimuli focuses on different aspects of the new venture process. Similar to
40 Rasmussen (2011), the contours of a stage or life-cycle process (causative goal formulation,
41 implementation, evaluation and modification of goals), which assumes that change processes
42 proceed through defined steps or stages of development, were visible in all of the teams, but
43 progression through the life-cycle stages were by no means linear or uniform across the groups.
44 Progression was affected by dialectics (academic and SE input; conflict) leading to changes in
45 the balance of power between opposing entities. Teleological processes (all groups had the final
46 event in mind) guided the groups' path towards the goal, although this path was shaped by
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3 experience, group diversity and stress; and evolutionary theory, which assumes that change
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5 processes move through a continuous cycle of variation, selection and retention was influenced
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7 by unpredictable events, environmental changes, and history.
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11 Our results also concur with Dew et al. (2009) who found that MBA students made decisions
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13 regarding possible opportunities using a 'predictive frame'. Established entrepreneurs use
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15 causation sparingly (Dew et al., 2015, yet causation tends to dominate business school teaching,
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17 including our students' (Kickul et al., 2010; Matlay, 2008). We suggest that this conditioned
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19 them to behave in ways (Calvard, 2015; Minniti, 2008) that may have been ineffective given
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21 the nature of the task, its time frame, and the resources that they had available (Duxbury, 2014).
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23 We also speculate that causation, being less risky and psychologically expensive (Grupe and
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25 Nitschke, 2013; Pittaway and Cope, 2007), prevailed over experimentation because of the
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27 students' need to address two goals simultaneously - to engage in entrepreneurial value creation
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29 and to pass the module.
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35 Groups with an experienced member, who acted as coach and conflict-mediator, used more
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37 effectuation and also exhibited more of all three types of OM behaviours than the inexperienced
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39 groups. Although competitive performance was not part of the students' brief or assessment,
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41 five of the groups that surpassed their fundraising targets used more OM behaviours,
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43 specifically more effectuation, than the less successful groups. Those that encountered conflict,
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45 typically because of the international diversity of the group, tended to perform worse.
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47 Intriguingly diverse groups which also had a member with entrepreneurial experience achieved
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49 more than their intended goals more than low diversity groups with an experienced member.
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51 We suppose that experienced students could exercise their knowledge of the range of OM
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53 behaviours, capitalizing on the resources within the group, and choosing which behaviours to
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3 use to their greatest effect. This suggests that groups with entrepreneurial experience are able to
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5 capitalise on diversity, whereas those without cannot.
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9 Tight deadlines and perceived task-difficulty act as stressors (de Clerq et al., 2014), putting
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11 pressure on team functioning (Costa et al., 2015; LePine et al., 2005). Students became
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13 increasingly aware of the multiple expectations that they were faced with, having to pass the
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15 module at the same time as raise money for a deserving cause. These may reduce the propensity
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17 to take brave decisions or risks (Bradley et al., 2012; Dutta and Thornhill, 2014), something
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19 which experience appeared able to counter. Inexperienced students tended to rely on what they
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21 had been taught, whereas experienced students had a greater repertoire of knowledge to draw
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23 upon. The groups only needed one person of this kind to influence choices of OM behaviours
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25 (Brettel et al., 2012); for some reason more than one experienced member made little
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27 difference. Nevertheless, it suggests that educators may need to intervene in the membership of
28
29 groups so that entrepreneurial experience is part of the mix. Inexperienced students were
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31 dependent on rationalisation and analysis rather than intuition or other heuristic-based decision-
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33 making processes that more experienced students could draw upon (Kickul and Gundry, 2011).
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35 Experience may give confidence in decision-making processes, and is also likely to increase
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37 awareness of the types of resources needed (Berends, et al., 2014), the means of obtaining them,
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39 and the consequences of failure (Brinckmann et al., 2010; Gielnik et al., 2015; Rasmussen et
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41 al., 2006).
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50 **Conclusion and recommendations for further research and practice**

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52 Our findings contribute to theoretical debates in a number of areas of entrepreneurial learning.

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54 Firstly, there is little empirical research on the use of OM behaviours, less on the underlying
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3 reasons for the choice of these behaviours, and even less on the use and causes of these
4 behaviours by students (Dew et al., 2009; Perry et al., 2012; Welter et al., 2016). Our research
5 also introduces the microcosm as a learning environment that allows students to enact OM
6 behaviours, thereby mixing practice-oriented and theoretical knowledge in OM education
7 (Fayolle, 2013). Currently its teaching is largely disconnected from the exigencies of
8 entrepreneurial practice (Edelman et al., 2008; Vanevenhoven, 2013). The approach that we
9 describe in this paper helps to bridge this gap in showing how students develop their ideas into
10 outcomes in a specialized-task setting which in our case focused on fundraising for a social
11 enterprise.
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24 The use of a fundraising project as a substitute for learning in an actual entrepreneurship
25 context focuses attention on the role of microcosms as pedagogical devices (Kapranos, 2016;
26 Mair and Marti, 2009; Welter et al., 2016). Kyrö's (2015) view is that microcosms offer
27 radically new vision of learning because of their creative, responsibility-inducing and risk-
28 exposed dimensions. Although they have some differences, they have some similarities to the
29 entrepreneur's world, and mimic to some extent the pressures that entrepreneurs actually face.
30 They encourage, and even force, students to engage in a range of resource-creation activities.
31 However, what a microcosm should look like is more uncertain. We believe that the fundraising
32 project that we used in this study provided a useful pedagogical device for engaging students in
33 the entrepreneurial process and creating empathy among novices about the entrepreneurial life
34 (authors, 2013; Gibb, 2010; Kapranos, 2016). There are few empirical studies on what makes
35 for effective learning environments of this nature (Fayolle et al., 2016). For example, how
36 difficult and time-pressured should the task be? Complexity, risk, uncertainty and working with
37 different stakeholders are all contextual factors known to shape behavioural choices in the 'real'
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3 world. Should a microcosm attempt to imitate this? If so, how? Students have different levels of
4 skill and different experiential backgrounds to entrepreneurs, and the nature of the task needs to
5 reflect this if students are not to be frightened off from entrepreneurial careers.
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10 Responding to a resource-constrained task forced our students to use a range of skills (e.g.
11 creativity, negotiation, working with stakeholders). And from their logs we could see a
12 developing awareness of their need to change behaviours, and arguably become more
13 resourceful, over time. This was despite not having been formally taught these skills. However,
14 we caution that coaching was used to support the students, which may have shaped the
15 students' behaviours as some of the academic coaching team were experienced entrepreneurs.
16 As Fayolle (2013) suggests, coaching is inherently effectual as it provides a feedback loop that
17 encourages students to reflect on what they have done, what has worked, and what now needs
18 to be done differently. Arguably this is why we saw the use of effectuation only at a later stage
19 of the project (Sarasvathy, 2001). We would recommend that the principles of effectual or
20 bricolage logic should be taught, if only to make students aware of their possibilities and perils.
21 Further research could attempt to understand the differences between students who have been
22 taught about the OM behaviours in a conventional classroom and those that learn about them
23 through discussions with experienced entrepreneurs or through learning-by-doing. We also did
24 not examine the learning process and further research could usefully identify which platform
25 provides for the most insightful personal development.
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48 We did not specifically explore the issues around diversity and numbers of relevant groups
49 were small. This is something that we believe would warrant further investigation. Our data
50 revealed that the national backgrounds of group members was an important influence on
51 behaviours. Diversity is a known contributor to group conflict, as its opposite, homogeneity, is
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3 a known factor in group agreement or groupthink (Moreland et al., 2013; Apfelbaum et al.,
4 2014). The cultural background of students and the socio-psychologically derived attitudes that
5 are the result of innate factors in combination with socialisation processes (Autio et al. 2013)
6 are likely to have influenced decision choices through enhancing the potential for conflict
7 within groups, given that they were under considerable pressure (de Wit et al., 2012; Nouri et
8 al., 2013). How, specifically, diversity influenced behaviours remains to be answered.
9 However, we hypothesize that a student's previous entrepreneurial experience likely to make a
10 diverse group more able to resolve any conflict that does develop, as skills in the resolution of
11 disagreements and handling of stressors are brought to the discussions on task behaviours
12 (Yeung et al., 2015).
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27 Similarly, we did not evaluate the effect of the students' intended future careers on behaviour,
28 for example if, whether they had already decided to create their own ventures when they left
29 university they were more motivated to experiment with different behaviours.
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35 A question that remains to be answered is whether the fund-rising performance would have
36 improved if students had been more familiar with the different types of OM behaviours through
37 being introduced to them in the classroom. Although this was not part of our study, it appears
38 that there were links between the use of a wider repertoire of OM behaviours and financial
39 performance. We speculate that learning about OM concepts would help students to use them
40 more effectively, improving their performance accordingly. This is something that would
41 benefit from further research. Whether students would use the same types of behaviours given a
42 different microcosm has also not been studied. A better understanding the links between context
43 and behaviours would help both educators and practitioners alike to understand when certain
44 categories of behaviours are more useful. Our study did not attempt to measure the
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3 effectiveness of the different behaviours, or link them with the types of fundraising activities
4 that the students chose. Future studies could also include the backgrounds of students, for
5 example whether those from specific academic disciplines or different cultures, influences
6 which OM behaviours they prefer, and why.
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13 Other types of entrepreneurial behaviours were not considered in our study. An example of this
14 is the role of 'improvisation' by entrepreneurs as a possible additional approach to the
15 categorisation of entrepreneurial activity (Duxbury, 2014). Baker and Nelson (2005) suggest
16 that organisational improvisation can be an important precursor to bricolage, yet this is not
17 considered in Fisher's model and we did not investigate it. Students working under time and
18 physical resource constraints faced unpredictable and unanticipated consequences (Fayolle,
19 2013; Duxbury, 2014), making improvisation appropriate. As a side issue, we would concur
20 with those that have criticised the OM model as being rather repetitive and overlapping (Welter
21 et al., 2016), and would recommend further refinement of the categories. Bricolage is where our
22 data encountered unclear boundaries between the different categories (Baker and Nelson 2005;
23 2012); we sometimes found it challenging to decide in which classification data should be
24 placed. For example 'using resources at hand' (effectuation) and 'making-do with what we
25 have' (bricolage) seemed to overlap (Welter et al., 2016).
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44 Finally, although not discussed in detail in this paper, we saw evidence of students identifying
45 themselves as 'entrepreneurs-in-the-making'. We argue that this is the effect of the microcosm,
46 which imitated as far as possible the real world and the real pressures, experienced by
47 entrepreneurs. We suggest that the students' obvious engagement and immersion with the
48 entrepreneurial decision-making process reflects the powerful effect of 'real-life' action
49 learning (Gielnik et al., 2015). Thus, another avenue for further research is to understand how
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3 the construction of an entrepreneurial identity can be encouraged through engagement with
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5 actual entrepreneurs engaged on genuine entrepreneurial tasks.
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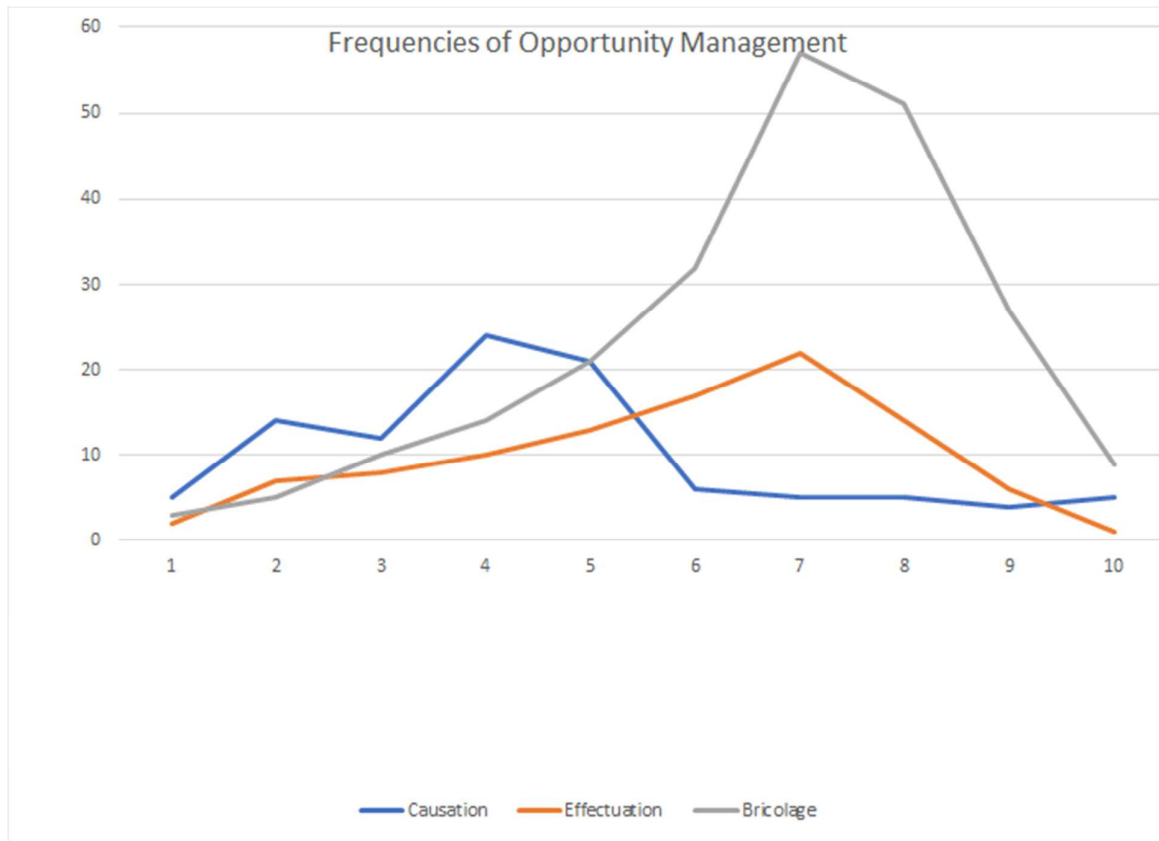
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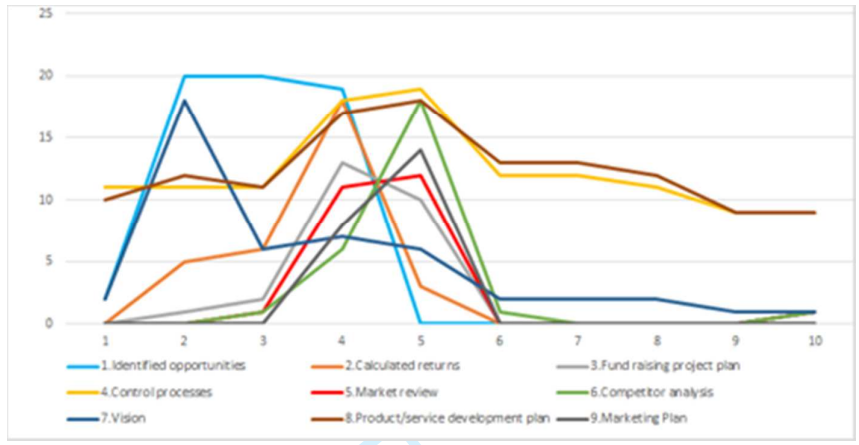
Figure 1



Review

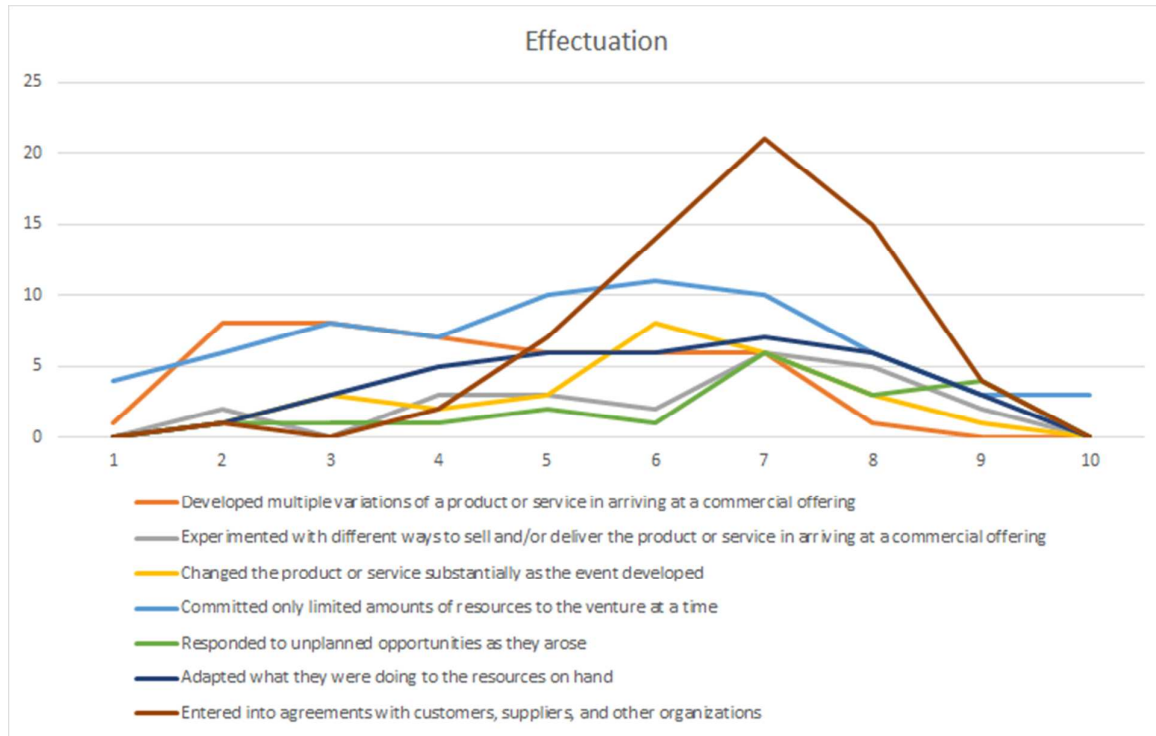
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Figure 2: The pattern of causation behaviours over the 10 week period*.



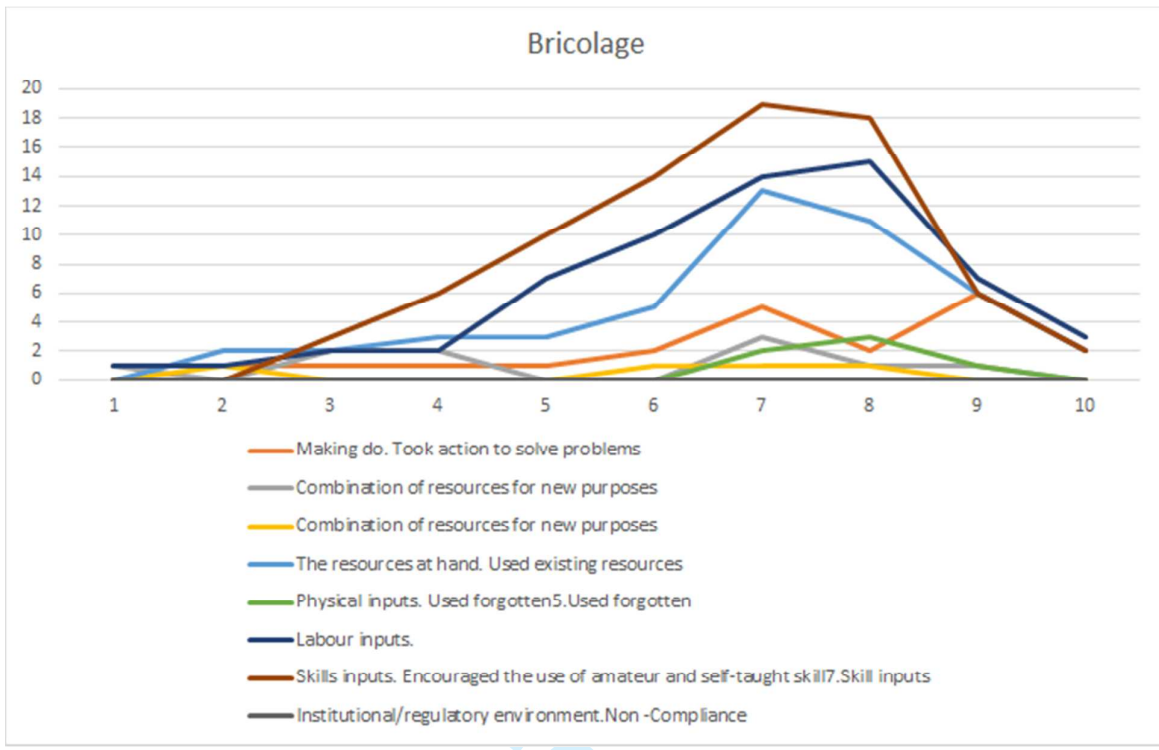
For Peer Review

Figure 3: Effectuation behaviours over 10 weeks



Review

Figure 4: Bricolage behaviours over 10 weeks



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Figure 5: The Use of Opportunity Management Behaviours Over Time

Adapted from Rasmussen (2011)

Life-cycle stages

Stage 1 Induction	Stage 2 Developing valid ideas	Stage 3 Developing operational plans and resource identification	Stage 4 Negotiation for opportunity	Stage 5 Implementation	Stage 6 Survival
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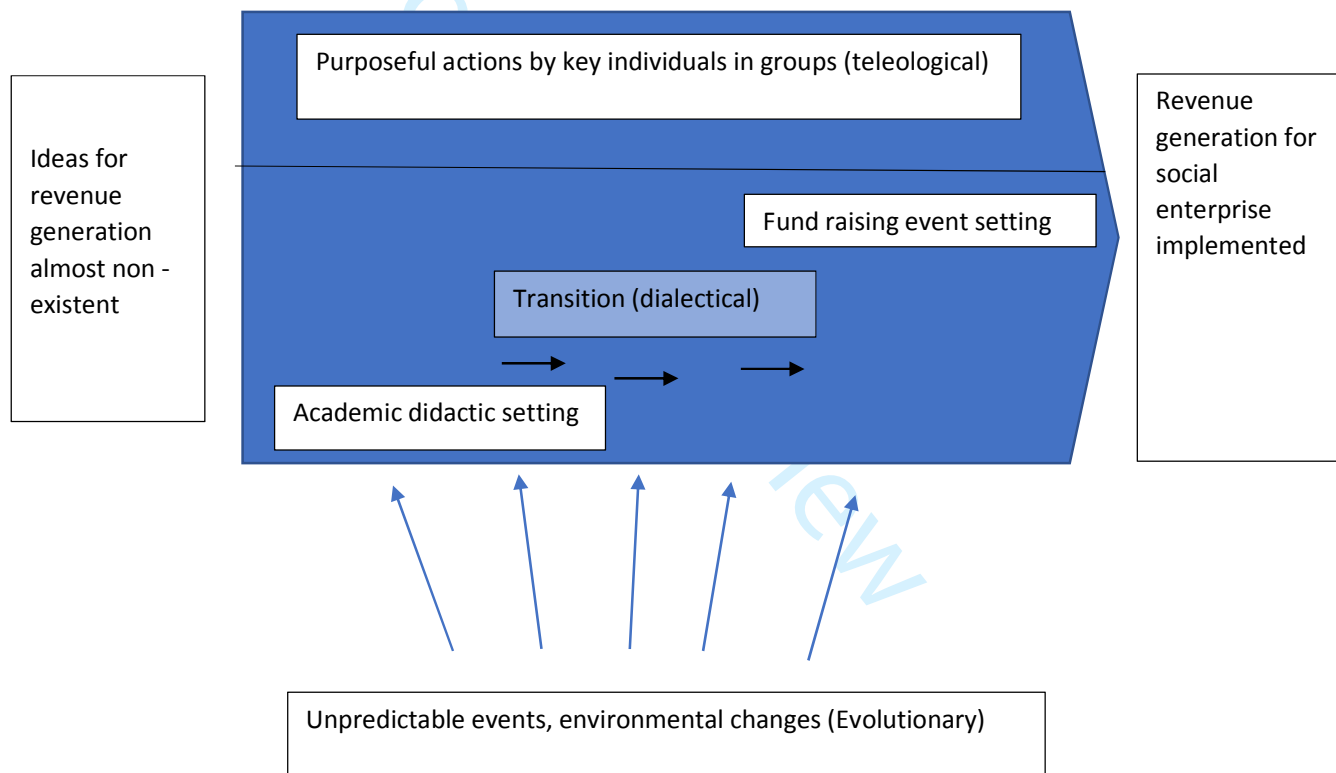


Table 1 Demographics of the student groups and commentary on group functioning

Group no.	Social enterprise	Male	Female	International diversity %	Experienced member %	Performance against target	Comments on group processes
1	International aid charity	2	3	40	0	45%	Wk 1-3 100% attendance, with all tasks completed. Week 4 - 6 attendance at meetings went down to 60%. Conflict led to reduction in ambitions for the project. By weeks 7-9 attendance returned to 100%, aided by tutor's intervention. Tended to improvise during the event in week 8 as they reflected on their performance.
2	Hospice	2	3	20	0	62%	High attendance during initial weeks, individualistic, collective, low motivation-poor allocation of task but full attendance in week 9 and week 10
3	Hospice	4	0	0	0	87%	Highly motivated group with maximum weekly attendance. Worked collaboratively with clear allocation of tasks. Sought to resolve conflict. Self appointed task leaders, based on perceived expertise.
4	Hospice	5	0	0	0	25%	Lacked motivation and poor attendance at the start; 60% until week 6 when members became conscious of assessment requirements. Lack of communication within the group. Sought to resolve conflict at later stages. Event cancelled (funds came from sponsor).
5	Hospice	1	4	20	40	134%	Highly motivated group with consistent attendance and engagement. Full engagement from members. Clear allocation of tasks, but tended to be highly detailed in weekly plan with too many action points, and repeated reminders of the task from one experienced member caused conflicts between week 5-7. Poor donation levels in week 7 led to conflict resolution in order to achieve the target.
6	Teenagers' charity	5	1	0	20	117%	Highly motivated and engaged group with clear allocation of tasks and roles between weeks 1- 6. Conflict developed as the experienced member accused the inexperienced members of being less engaged. Stung by the accusation one of the inexperienced members initiated a collection in weeks 8-10.
7	S. African women's charity	1	4	40	0	123%	Highly engaged and motivated group throughout the 10 weeks. Good level of discussion led to clear and detailed allocation of tasks and roles.
8	Head Injuries charity	4	0	50	0	42%	Attendance was consistent throughout. Enthusiastic, but poor in their execution of tasks. No conflict or argument over proposed ideas, but actually little discussion too. Most of the the tasks and roles were appointed by one self-appointed 'ringleader'.
9	Head Injuries charity	3	2	60	20	107%	Highly engaged and motivated group throughout the 10 weeks. High quality discussion of ideas led to clear and detailed allocation of tasks and roles.
10	Children's charity	3	3	0	0	8%	Group conflict was at the centre of this group over the whole 10 weeks. Members were not united and had different goals for the event which were not resolved. Allocated tasks were not executed. There were a lot of accusations flying about, with members not trusting each other. Despite support from tutors, group members were still at loggerheads until week 10. The event did not happen; the only income came from donations.
11	Children's charity	1	4	20	20	160%	Highly engaged and motivated group throughout the 10 weeks, high level of discussion of ideas led to clear and detailed allocation of tasks and roles.
12	Children's charity	2	2	0	0	93%	Highly engaged and motivated group throughout the 10 weeks, High quality discussion of ideas led to clear and detailed allocation of tasks and roles.
13	Children's charity	3	2	20	0%	33%	Group attendance hovered around 60% between weeks 3-6. By week 7 attendance increased to 100% as members became aware of the need to develop ideas for the project. Shortage of time was the prime reason for the poor performance.
14	Children's charity	2	3	20	0	117%	Highly engaged and motivated group throughout the 10 weeks. High quality discussion of ideas led to clear and detailed allocation of tasks and roles.
15	Children's charity	5	0	20	0%	22%	Characterised by group conflict throughout the 10 weeks as one dominant international student thought he worked harder than others and members were avoiding him. He was complaining that others did not complete the work that he had allocated. Tasks achieved were never to his satisfaction. Other group members eventually contributed to the event, but this was despite his wishes
16	Hospice	4	2	0	0	83%	A motivated group where any conflict over ideas was resolved. Roles and tasks allocated well and were always achieved. Attendance averaged more than 80% over the 10 weeks. Did not achieve their intended income target through no fault of their own.
17	Children's charity	5	0	40	0	67%	Enthusiastic group. Full attendance from week 1 to week 6, then attendance at 80% in week 7-9 and full attendance week 10. Conflict arose when roles and tasks were not clearly defined in the action plan, were not in actionable form and therefore weekly targets were missed.
18	Hospice	3	3	17	0	105%	Highly engaged and motivated group throughout the 10 weeks, with the exception of two international students who were not engaged for the first four weeks. However, the group worked hard in order to get the two members involved. High quality discussions of ideas led to clear and detailed allocation of tasks and roles.
19	Children's charity	3	2	80	0	85%	Highly ambitious, internationally diverse, group. Extremely motivated towards putting ideas and plans into action. However, by weeks 7-8 motivation of members had dropped due to absenteeism and conflict over the allocation of tasks. Targets were over-ambitious and the group was not able to achieve the targeted amount. One member remained in disagreement till the very end.
20	Head Injuries charity	5	0	20	0	54%	Members clearly enjoyed working with each other. There was no sign of conflict. However the weekly action plans were rather descriptive and roles, tasks and targets to be achieved were not clear and rather vague.
21	Head Injuries charity	2	3	0	0	83%	A very enterprising and motivated group with clear allocation of task and roles. No indication of conflict throughout the 10 weeks.
22	Head Injuries charity	1	4	20	0	68%	A highly motivated group with full weekly attendance. However, were rather inward looking, preferring to use their own resources instead of working with sponsors or suppliers
23	Hospice	2	2	25	0	52%	A group of very reserved and quiet individuals. Initially developed a lot of ideas but because of procrastination little action was taken to develop the ideas until week 6 where time became pressing. Tutors needed to put more effort into guiding this group as members were rather timid and risk averse
24	Teenagers' charity	3	2	0	0	53%	A group that experienced conflict from week 1 due to the religious beliefs of a member, who did not want to visit the SE because of its perceived lack of cleanliness. Nevertheless all members worked collaboratively with high levels of attendance each week. Members were courteous to one another, with clear task allocation and feedback. Getting sponsorship was only successful from week 7 onwards, and on the day of the sale, members could not turn out which resulted in poor performance.
25	Teenagers' charity	3	2	20	0	42%	The one international member in the group attempted to set himself up as the role model to the rest of the group. This became the source of conflict and frustration. Eventually the members came together as a team in order to work on the fund-raising event. By weeks 7-9 they were working closely with sponsors, but not potential consumers.

Table 2: Examples of students' causation behaviours

Causation category	Example	Week	Stimulus	Consequences (intended and unintended)
Develops a project plan to develop the product and/or services	Gp.17: We need to arrange the next group meeting. Next Wednesday before classes - NB: ** cannot join, however he will contribute on Facebook or in mail. Learn by reading how this idea could be marketed	1	Awareness of the need to conform to academic requirements and achieve the targeted fundraising objectives	Helped to identify options, and allocate tasks and roles within the group Identified expertise and inexperience. In some groups led to individual attempting to dominate in order to try to achieve the intended outcomes
Organizes and implements control processes	Gp This week we aim to catch up on the tasks we were not able to achieve last week ... our biggest objective is to secure and guarantee use of our chosen venue. Once this has been achieved we can be a lot more specific with our tasks and team goals. Gp 12: This week we focused on the Risk Assessment, pinpointing the types of uncertainties that could affect the progress of the event. The risk could arise from two main variables the venue and stakeholders	1: 3 5	Awareness of failure to achieve targets and pressing time frame for decisions to be taken; Desire to succeed; Application of tools and techniques that they had learned previously Increasing awareness of the potential of university regulatory non-compliance	Made the internal environment more predictable. Gave structure to decision-making, and confidence that the process was on course. For dysfunctional groups provided a source of stress and increased dysfunctionality, leading to demotivation and absenteeism, and eventually to greater use of bricolage later in the project
Calculates returns of various opportunities	Gp 12: 84% of the students interviewed showed interest in a theme party, and told they would come. This confirms our belief that we will fulfill unmet needs within our target. Then, the 4 options submitted got close results, so we need to choose a theme which satisfies everybody.	4	Initial research brings about an awareness of the need to identify potential customers and the most profitable returns	Applied learning from previous classes. In some cases spurious confidence in the planning and financial calculation process led to errors that might have been prevented if the group had taken a more experimental route
Gathers information about competitors and compared their offerings	Gp 19: Our main competitors would be the other students who are doing this same module and have the same assignment. All the information about the ideas for fundraising have been kept confidential. However, we were able to gather some information about the events through word-of-mouth ... Since this event is completely different from the one we are hosting, we don't think it would be a potential competitor or a threat. Another competition might be the Messy Mondays event which takes place every Monday. However, we plan to collaborate our event with Messy Mondays' in order to attract more people	5	Increasing awareness of the performance (and potential threat from) other students within the cohort; desire to do well; recognition of the synergistic possibilities from collaboration.	Increasing awareness of competitors and potential for other options Increasing awareness of the need to exploit additional resources and break out from conventional 'zero-sum game' thinking

Peer Review

Table 3: Examples of students' effectuation behaviours

Effectuation category	Example	Week	Stimulus	Consequences (intended and unintended)
Experimented with different ways to sell and/or deliver the product or service in arriving at a commercial offering	Gp 5: Create Just Giving Sample page and write down IN IT a step-by-step on how to do it in order to help contestants create their own Use Freemium social media for research and getting sponsors: Use Time-Out Magazine to source contact numbers for various art galleries. Use Google to research sources we can get prizes from (e.g. PC World, Argos, Amazon etc)	6	Experienced group was aware that different offerings would produce different results. Also experienced with digital media and research	Ability to compare possible outcomes Excitement as the opportunities became apparent
Changed the product or service substantially as the venture developed	Gp 6: [following an attempt to broadcast on radio which did not raise sufficient funds] In week 6, we decided to execute another event to raise money - using the [donation] bucket available from SE. along the street Gp 4 There is no interest in participating in the talent show. Found a zumba trainer [group decided to hold a Zumba dance], need to find another trainer as a backup in any case our primary can't attend.	6 8	Commitment to achieve the goal, motivated to achieve the target, and awareness of the lack of success of the original idea	Stress of failure stimulated awareness of the need to change course Even experience (Group 6) did not prevent poor performance and the need to rethink what needed to be done Stimulation of creative problem solving and effectual experimentation Stimulation of seeking out of external resources
Committed only limited amounts of resources to the venture at a time	Gp 12: Also, we thought about extra marketing actions that would generate more benefits for SE ... For that we need to contact: Suppliers to provide the communication media (tee shirts, bracelets and gadgets) Suppliers to do the printing Eventually, sponsors to cover the extra costs	3	Awareness of internal resource limitations Desire to not lose their own money	Inexperienced group took longer to realise that they have limited resources of their own and needed to seek external resources Some groups decided to use their own money rather than seek resources from elsewhere
Adapted what they were doing to the resources at hand	Gp 11: After talking with the course instructor about our project and the viability of it, it was decided that the project can be done but would be more interesting for our clients to be able to buy a piece of cake and a hot beverage [they decided to hold a British Tea Party to capitalise on the London Olympics 'vibe' that was happening at the time]. We will be selling cakes and tea and coffee.	3	Recognition of the need to be realistic and creative in terms of maximising resource utility	Inexperienced group thought they should use their own money in order to make the event happen, even though this was not an officially sanctioned option Group with experienced members knew earlier, and better, what they could do
Entered into agreements with customers, suppliers, and other organizations	Gp 11: We will also physically meet or contact the student union at their campus offices on Monday inquiring on how and where to get permission to use the Uni yard for our cake stall. Meeting with coffee machine sponsors on Monday to see what their decision is in securing us a machine for the event(s)	2 3	Recognition of need to obtain the external resources provided by customers, suppliers etc in order to ensure success of the project	Learning about the potential expansion of resource base from ecosystem members

Table 4: Examples of students' bricolage behaviours

Bricolage category	Example	Week	Stimulus	Consequences (intended and unintended)
Combination of resources for new purposes. Combined existing resources in creating solutions	Gp 11: I can ... promote my shoe business and at the same time tell the world about how my business is helping the SE	3	Increased understanding of the potential for synergies	Improved resource allocation Increased awareness on the part of inexperienced groups especially that they could achieve more by being creative in the way that they brought together resources
Reused resources for purposes other than those for which they were originally designed	Gp 17: Fortunately, the Student Union has a licence to screen a movie for student entertainment and they allowed us to use this licence to generate income for the SE	8	Awareness of the limitations of the group's own resources, therefore had to cast around for others'.	Inexperienced groups lacked ideas and at the last minute needed to depend on staff suggestions e.g. Gp 17 Experienced groups had the ability to assess the potential of what was available, leading to earlier and better use of resources
Physical inputs. Used forgotten, discarded, worn, or presumed 'single-application' materials to create new solutions	Gp18: [The sunflower was an iconic symbol used by the SE in fundraising campaigns] Decided to come out with the Sunflower Event as SE had a lot of Sunflower badges left from a previous event. the sunflower was to make awareness of the SE. It can be bundled as a package [with other donated goods] for sale	7	Opportunistic recognition of spare resources	Learning of the potential synergies between SE's ethos and underexploited resources Awareness of the potential to increase revenue without spending anything on inputs
Skills inputs. Encouraged the use of amateur and self-taught skills that would otherwise go unapplied	Gp1: This week, as we have changed idea drastically we need to get a big move on and the new idea is based on selling products ... Therefore this week each member must contact at least one company and ask them, in detail, what can be done to help us. In short, it is a mini phone pitch to them for sponsorship	5	Awareness of the pressing need to avoid the event failing	Fear of failure, stimulating the last-minute use of amateur skills