B.4 Teaching and Learning Creativity in Virtual Settings: A thematic analysis of the factors that hinder or foster creativity through the lenses of an artist

Student

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1 Introduction

The role of creativity in the economy is seen as crucial to assist nations in attaining higher employment and economic achievement and to cope with increased competition (Davies, 2002, Burnard, 2006). As a consequence, education systems are being required to undergo "a major overhaul in resources, attitudes, and understanding" so that creativity can be valued to manage literacy as a non-linear information structure through different settings (Turner-Bisset, 2007). Nourishing and fostering creativity in all educational settings while using technology as a conduit unlocks the opportunity to produce a highly employable workforce with 21st-century skills. Hence, the major challenge lies in how educators can prepare students by fostering creativity and enhancing 21st-century skills through information and communication technologies (ICT) in a virtual learning environment, referred to as a "virtual setting" in this study. This paper aims to explore the factors that hinder or foster the teaching and learning of creativity in a virtual setting through smart devices by conducting five expert in-depth interviews with "Pro-C" artists from various professional backgrounds and applying a thematic analysis to derive implications for educators and students for using technology as a conduit to enhance creativity.

2 Literature Review

Unlocking creativity in virtual settings.

This research in progress aims to investigate how to foster creativity in a virtual environment. Therefore, creativity is studied as a state that can be influenced rather than a fixed character trait. According to Rhodes (1961), creativity is a confluence of four aspects: (a) the press; (b) the creative process; (c) the creative person; and (d) the creative product (Garces et al., 2016). This paper focuses on exploring creativity in the virtual setting, special attention will be given to "the press" as it refers to (a) the place where the subject is; (b) where the product is produced (Garces et al., 2016); or (c) where the creative process occurs (Scritchfield, 1999). The "creative process" will be explored through the Geneplore model (Finke et al., 1992) to compare the generative processes to form pre-inventive structures by associating stored conceptual structures and exploratory processes to functionally interpret the pre-inventive structures until a creative outcome is constructed (Sternberg & Kaufman, 2011).

The "creative person" will be investigated through Amabile and Pratt's (2016) dynamic componential model of creativity describing individual creativity through three main components: skills in the task domain, intrinsic motivation, and creative-relevant processes while exploring growth and fixed mindsets (Karwowski et al., 2020). Lastly, the "creative product" is seen as the optimal environment for teaching and learning of creativity in a virtual setting by highlighting O'Quin Besemer (1999) main characteristics: (a) novelty; (b) resolution; and (c) elaboration/synthesis (O'Quin Besemer, 1999). For the exploratory approach of this research, interviews are conducted with professional artists, corresponding to the "Pro-C" creativity dimension of the Four C model of creativity. This is defined as professional-level creators who have not yet attained a truly eminent status (Kaufman & Beghetto, 2009) but are significant enough to enhance their domain growth with their contributions.

3 Methodology

This explorative study evaluated the factors that foster or hinder the teaching and learning of creativity in a virtual setting by conducting semi-structured interviews with "Pro-C" artists. A purposive sampling approach (Patton, 2002) was adopted to select information-rich cases. Thirteen "Pro-C" artists from various professional artistic backgrounds, with a minimum of five years of experience, were selected because they have domain-specific expertise on creativity and have creative-relevant skills that are favorable to taking new perspectives to situations and exploration of new cognitive pathways (Amabile, 1988), which is key to providing an understanding of creativity in different contexts. The interviewer guide follows Patton's 2015 interviewing guidelines for qualitative interviewing. The interview guideline was comprised of twelve questions involving creativity as a concept, "virtual settings" as a constraint or a driver for creativity, personality characteristics that enable creative thinking, and motivation. These questions were based on Amabile and Pratt's (2016) dynamic componential model of creativity. The semi-structured interviews were conducted in English and Spanish, depending on the preference of the interviewee, with a duration between 45 to 80 minutes online via Zoom in Spring 2021. In this research, the theory is both an outcome and precursor of data analysis to enable the researcher to have more flexibility when analyzing data (Frith and Gleeson 2004; Hayes 1997). A thematic analysis was followed consisting of a hybrid approach, (1) an inductive approach through grounded theory, and (2) post-empirical deductive reasoning integrating theory from the creativity literature (Boyatzis, 1998). The coding process in this study was guided by the figure 1 located in Appendix, that was developed using a computer-assisted qualitative data analysis software (CAQDAS) also known as MAXQDA. The process followed three main cycles: open coding, axial coding, and selective coding. Figure 2 displays the identification of themes in the initial coding step. The identified themes were environment, domain-relevant skills, motivation, and creativity.

Consequently, selective coding was categorized based on Jordanous (2015) arguing that computational creativity, a new area of study, should be studied through the Rhodes (1961) "Four P Model of Creativity": press, process, person, and product. Thereby, the emerging themes were categorized into Rhodes's (1961) Four P model of creativity as a framework to structure the data. During the selective coding phase, Amabile and Pratt's (2016) dynamic componential model of creativity, self-belief theories, and O'Quin Besemer's (1999) main characteristics for teaching and learning creativity emerged from the data. The Geneplore model (Fink et al, 1992) was integrated using post-empirical deductive reasoning to complement the creative process theme. Figure 1 provides an overview of the theme development of this study.

4 Results

This is a research in progress; therefore, the presented results are not conclusive. Four themes were categorized into Rhodes (1961) Four P Model of Creativity:

1. Virtual settings as a challenge and driver for change (press)
2. The creative process as a driver for optimal use of virtual settings
3. The creative person as the core element of virtual settings
4. Optimal conditions for online education as a product of creativity in virtual settings

Theme 1: Virtual Settings.

Interviewees identified a strict delimitation between "online" and "offline" settings and a need to distinguish what tasks could be done online and which require face-to-face interaction. Interviewees reported six main factors which make the difference between virtual and face-to-face settings: *human contact, supervision, external stimuli, sense of security, boredom, distractions, tolerance for ambiguity, and time pressure.* Additionally, they outlined different challenges in online education with emerging themes directly related to lack of proper resources, adaptation, and communication issues. These challenges were oppositely described as drivers for change when related to opportunities in virtual settings, as there is an infinite number of online tools and platforms that can positively impact the space for creativity.

Theme 2: Creative Process.

Interviewees reported the creative process in virtual settings as a driver for optimal use of virtual settings. During the generative process, most interviewees described *investigation* and *lecture* as an essential part of the creative process to awaken the *imagination*. During preparation, they also denoted that time should be carefully assigned hinting that "too much time might kill creativity." In the exploratory process, an interviewee denoted that reflection and experimentation are core components as they open the opportunity for greater creative outcomes, following reiteration. Another interviewee highlighted that these creative outcomes are driven by originality and the correct use of references.

Theme 3: Creative Person.
Interviewees reported independence, self-discipline with the need for self-improvement and experimentation, relative unconcern for social approval with a humbleness attitude, orientation towards risk-taking combined with perseverance in the face of frustration, and tolerance for ambiguity as the main drivers that enable creative thinking. Interviewees highlighted that virtual settings are driven by extrinsic motivation, especially online education. Participants characterized the lack of proper resources as a motivation killer, resulting in frustration, increased conformist attitude, and lack of respect towards self-expression.

Theme 4: Optimal conditions for fostering creativity.
The fourth theme is outlined as the *optimal conditions* for online education as a *product* of creativity in virtual settings. Participants characterized five main drivers for optimal conditions: a) resources, b) main characteristics of optimal conditions, c) synergistic extrinsic motivators, c) growth mindset e) educators' role in learning.

5 Conclusion

The twin forces of the COVID-19 pandemic and the Fourth Industrial Revolution have accelerated the shift of education into virtual settings, demonstrating one of the main personality characteristics of creativity: tolerance for ambiguity (Amabile, 1988) as a driver for adaptation to virtual settings. The findings of this study indicate the creative person and a growth mindset are the core elements for online education through the use of Rhodes (1961) four Ps, which supports Csikszentmihalyi's (1996) flow theory, which consists of set characteristics of the 'optimal experience' of 'flow in creativity: the clarity of goals; knowing how well you are doing; balancing challenges and skills; the merging of action and awareness; avoiding distractions; forgetting self, time and surroundings; the autotelic experience (Csikszentmihalyi, 1996, p.113–123). Additionally, artists indicated growth mindsets encourage creativity, whereas fixed mindsets, especially for educators, inhibit it. This result corresponds to Paek and Sumners's (2019) finding regarding how teachers who perceived creativity as fixed have been found to underestimate their students' creative potential and their own ability to teach (Karwowski et al., 2020).

The reference problem.
Participants negatively related inspiration to virtual settings due to the overuse of existing references. One major finding is the trap of "the reference problem" in virtual settings. This trap can hinder the "originality" and "novelty" of creativity, especially when students grow accustomed to utilizing online search engines as their primary source of inspiration. This situation not only hinders creativity but extends online education challenges by promoting conformism, laziness, lack of innovation, and authenticity.

This does not imply online search engines are a blocker for creativity; rather, it indicates that their inappropriate use can create detrimental consequences to the optimal creative environment, thereby also negatively influencing the generative creative process. Educators must encourage their students to seek inspiration beyond a Google search through external stimuli, thus fostering curiosity and synergistic extrinsic motivation. The overarching aim of this thesis is to explore the factors that hinder or foster the teaching and learning of creativity in virtual settings through the lenses of professional artists. The major findings highlight the main drivers and constraints of creativity in an online environment. The driving factors include synergistic extrinsic motivators (i.e. discipline towards a goal, sense of challenge, collaboration, and drive in self-satisfaction), growth mindset, and active educators' involvement in the learning process. The constraints highlight lack of human contact and proper resources as a hindering factor to communication for both educators and students. The current findings are limited to only 5 out of 13 interviews; deeper insights might be derived when the remaining interviews are coded and show a consensus among all the artists. This will be later assessed as this study is part of currently ongoing research.

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Student

Appendix

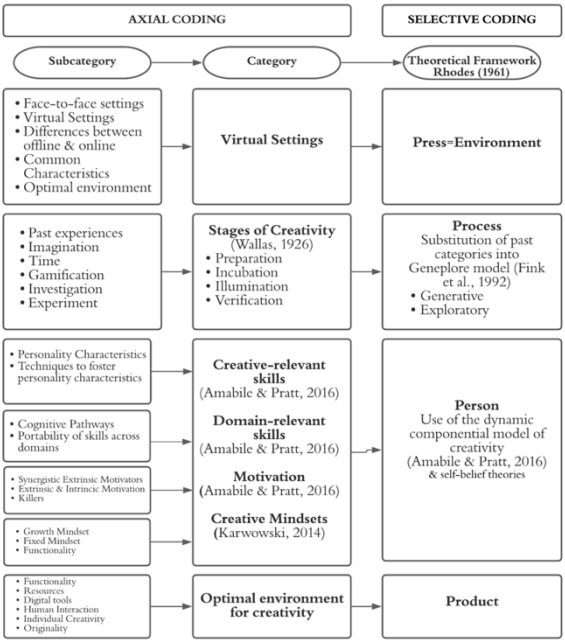

Figure 1: Theme Development

The figure displays the coding process the researcher followed in order to develop the four themes.

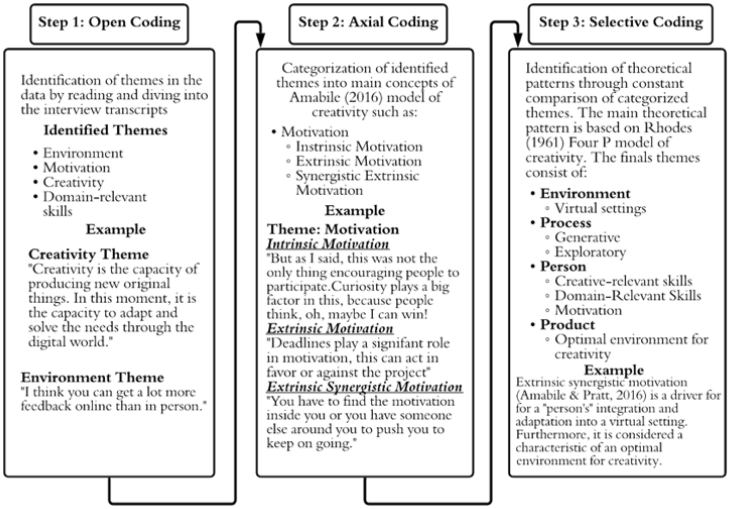

Figure 2: Coding Process

Figure 2 visualizes examples of the coding process that resulted on the final themes.