An Exploratory Study Examining Group Dynamics in a Hackathon

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ABSTRACT

Pairing virtual reality (VR) and augmented reality (AR) in a hackathon is beginning to receive attention. VR and AR tools have the potential to support different types of skill sets and help promote synergistic interconnections between team members. Since little is known about how a hackathon can contribute towards group dynamics, this exploratory study compared team dynamics that occurred in multidisciplinary groups during a weekend hackathon. Twenty-two multidisciplinary undergraduate and graduate students, in addition to two campus professionals, participated in the event held on a mid-size university in the South-Central Midwest of the United States. The groups were deliberately created by the research team to support different skill sets and disciplines based upon the in-group bias framework. Observations and video recordings occurred throughout the 2-day hackathon event. The non-obtrusive-participant observations resulted in noticeable differences between group dynamics in collaboration, teamwork, work style, and group presentations.

KEYWORDS

Group Dynamics, In-Group Bias, Multi-Disciplinary Collaboration, VR/AR Hackathon

INTRODUCTION

Virtual reality (VR) and augmented reality (AR) tools are becoming increasingly visible across various sectors globally. Although VR has existed in various manifestations since the 1960s (Jensen & Flemming, 2017), it has been defined differently by varied authors. Schroeder (1996) viewed VR as “a computer-generated display that allows or compels the user (or users) to have a sense of being present in an environment other than the one they are actually in, and to interact with that environment” (p. 25). Augmented Reality on the other hand can be defined as the combined existence of real and virtual objects in the same space that the user can interact with in real time (Azuma, 1997; Bower, Howe, McCredie, Robinson & Grover, 2014). The appeal of VR is that it gives a user the impression of being present in a different environment, and similarly, the appeal of augmented reality is that it can provide data or information in real time context that can overlay on an object in the physical world.

While VR and AR are not yet at a ubiquitous state (often limited by digital divide and to those with means to buy expensive devices), the excitement and possibility they offer are regularly discussed in educational contexts as well as in various industries where they are seen as possible mechanisms for providing training (Xu, Lu, Guan, Chen, & Ren, 2014). Amongst the varied possibilities, VR and AR tools have the potential to not only support different types of skill sets, but also help promote synergistic interconnections between team members working in a group (McLellan, 1994; Pantelidis, 1997). One of the ways to achieve this is by integrating them into hackathon practices especially with student populations in programs where using emerging technologies is the norm. In other words,

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pairing VR, AR and hackathons, can provide different affordance which are beginning to receive research attention.

Hackathons are becoming increasingly common. They are often used to facilitate and promote multi-disciplinary collaborations, learning and innovation generation (Karlsen & Løvlie, 2017). A hackathon is a fast-paced innovation event, often lasting several days with a large number of participants in multiple disciplines. Participants come together to solve a problem and often create or quickly build functional software that can receive additional future development (Mulholland, & Meredig, 2015; Page, Sweeney, Bruce, & Baxter, 2016). The frequency of hackathons that use virtual and augmented reality to solve problems are increasing (see: Alamari, Alabdulkarim & Al-Wabil, 2019; Horton, Jordan, Weiner, & Lande, 2018; Juraschek, Büth, Posselt, & Herrmann, 2018; Schoeb, Hein, Dressier, Adams, Schlager, & Miernik, 2018). Since multiple disciplines and stakeholders are involved in solving a complex issue in a short amount of time, the design process that is composed of group work has been shown to often lead to innovative design solutions (Sutton & Kemp, 2002).

While little is known about how a hackathon can contribute towards group dynamics, this exploratory study examined the group dynamics between participants in a hackathon held in January 2018. This event was hosted by the Design Department on a university campus in the South-Central Midwest of the United States. Twenty-two multidisciplinary undergraduate and graduate students, in addition to two campus professionals, participated in the event. The research team selected students and divided them into 5 groups of 4 - 5 team members each. The groups were deliberately created to support different skill sets and disciplines based upon in-group bias theory. Observations of group dynamics by video as well as personal notes were gathered. The non-obtrusive observations resulted in noticeable differences in group dynamics between teams in collaboration, teamwork, work style, and group presentations.

BACKGROUND

Although still a relatively new area of inquiry, the literature area of hackathons is vast. In this section, the researchers briefly present the history of hackathons, a review of literature on group dynamics, a review of interdisciplinary hackathon teams, and present work on AR and VR hackathons.

History of Hackathons

One of the easiest ways to see whether an idea has diffused is to observe the awareness of it outside of its main discipline areas. Diffusion in this context is used according to Evert Roger’s (2010) diffusion of innovation theory (DoI), which has been used to explain how, why and the rate at which new ideas spread or are taken up. In the context of this manuscript, one way to see how much the idea of a hackathon has spread is to see how much it manifests itself in different industries and in popular magazines (see Broussard, 2015; Aitken, 2016), which have noted that ideas of hackathons have manifested themselves in multiple places including finance, fashion industries and business schools (Lister, 2018).

The word hackathon is a combination of hack and marathon. Briscoe and Mulligan (2014), trace the first use of the term to 1999 and argue that it “is used in the sense exploratory and investigate programming (not as a reference to committing a cybercrime).” The term appeared in 1999, seemingly arising independently from open-source software developers of the OpenBSD computer operating system, and Sun Microsystems (which has since been bought by Oracle) marketers” (p. 2). However, the practice of hacking goes back decades further. One of the first recorded electronic hack occurred in 1903, when inventor Nevil Maskelyne disrupted a public demonstration of Guglielmo Marconi’s telegram, which was touted to be a secure form of communication (Briscoe & Mulligan, 2014; Maule-finch, 2015). Maskelyne managed to send a message on the telegram right before the demonstration, proving that the system was not secure. Hence, because of the origin of the concept, the term was associated with mischievousness and at times illegal activities until the turn of the current century.
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