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How Players Learn Team-versus-Team Esports: First Results from A Grounded Theory Study

Anonymous First Author
Institutional Affiliation
Address line 1
Address line 2
Telephone
firstauthor@institution.com

Anonymous Second Author, Third Author
Institutional Affiliation
Address line 1
Address line 2
Telephone
secondauthor@institution.com, thirdauthor@institution.com

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INTRODUCTION
Esports games are competitive multiplayer digital games that are commonly played in organised competitions between professional teams or players (Hamari & Sjöblom 2017). An essential part of Esports practices is learning the games and how to play them competitively, be it to play better or to better appreciate spectated matches, as evidenced by numerous online tools, knowledge platforms, discussions, and video on platforms like *Twitch* dedicated to teaching gameplay tactics and strategy (Taylor 2012, 2018; Hamari & Sjöblom 2017). Yet, with few exceptions, research on learning in games has focused on game-*based* learning: serious games and gamification that facilitate learning with relevance outside of gameplay (Whitton 2014, Boyle et al. 2016, Sailer & Homner, 2019). Where researchers have studied *game* learning, they have chiefly explored distributed expertise, collaborative knowledge construction, and the acquisition of scientific habits of mind in massively multiplayer online role-playing games (MMORPGs), with field data from the mid-2000s (Steinkuehler & Duncan, 2008; Oliver & Carr, 2009; Chen, 2012; Ask, 2016). By comparison, we know little about individual and peer learning of Esports games, especially in their contemporary online media environment, saturated with streaming, training bots, and the like.

To address this knowledge gap, we have been conducting a grounded theory study (Charmaz, 2014), mixing qualitative semi-structured interviews and contextual inquiry to develop a model of *how amateur and semi-professional players learn team-vs-team Esports games*. We here report our preliminary findings on learning processes, tools, and outcomes, comparing them with current literature around game learning. This study is part of a larger project aimed to inform designers how players

utilise existing tools to learn to play, and thus, how they might better support players in learning.

DATA AND METHOD
The present preliminary findings are based on interviews with 12 adult players (all male and UK-based), 4 of *Dota 2* (Valve 2013) and 8 of *Counter Strike: Global Offensive* (*CS:GO*, Valve 2012), recruited through online forums and personal connections. For comparison, we intentionally recruited players from two different games with varying degrees of expertise in a game, ranging from 8 hours recorded playtime to over 5,000 hours. Each interview was transcribed for analysis. Following grounded theory, we iteratively cycled between data collection, coding, and theorizing, continuously re-viewing and re-coding previous transcripts in constant comparison. The following reported codes have reached theoretical saturation, meaning even new data intentionally sampled to challenge them is easily accommodated by our codes.

PRELIMINARY FINDINGS
Player reports on learning *Dota 2* and *CS:GO* highlighted three different analytic aspects: *learning processes* (*how* players engaged with information and tools to learn), *learning tools* (what tools players used to find and disseminate information), and *learning goals* (the particular knowledge and skills players sought to learn).

Interviews showed several different yet interconnected kinds of learning processes, where players distinguished quite clearly between them, while also reporting sometimes fluid switching from one to the other. These four are *identifying* knowledge and skill gaps; *consuming* and internalising information; *applying* existing knowledge and skills in new contexts or combinations; and active *practicing* of existing knowledge and skills to improve and internalise them. Participants also highlighted the importance of *deliberation* as a meta-process or meta-quality: whether or what one learns in each process was reported to depend on the amount of connected deliberation.

Across these processes, participants reported using a variety of tools created by developers, the player community, or even themselves. 'In-built' or in-game tools used for learning were different *game modes* (e.g. competitive, casual, training environments) and various *add-ons and extensions* (like spectator mode, replays, ping systems, chat). Out-of-game, the primary tools used were *streaming services* (e.g. Twitch.tv, YouTube), *forums* (e.g. Reddit, Steam forums), *statistics services* (e.g. OpenDota), and out-of-game communication tools like TeamSpeak or Discord.

In terms of learning goals, these different tools and processes are variously (and as stated, often quite deliberately) used to learn about *basic controls* (mappings of buttons and keys to in-game actions) and *game mechanics* (goals, rules, and systems), train up *motor skills* used by actions in-game that involve quick muscle movements and low cognitive load, but also to identify, develop, test, and refine ever-changing *strategies* (high-level planning of player and team actions) and the so-called *meta* (the ongoing evolution of 'best' strategies globally or within particular team setups). Interestingly, players also reported actively learning *non-game-specific* knowledge and skills (e.g. prioritisation, teamwork) as well as meta-*learning skills*: understanding how one best learns and teaches.

DISCUSSION AND OUTLOOK

Many of the learning processes, tools, and goals we observed resonate with findings in existing research on game learning in MMORPGs (Steinkuehler & Duncan, 2008; Oliver & Carr, 2009; Chen, 2012; Ask, 2016). Two things that stand apart are the meta as a moving learning target, and the evolution of part- or fully-professional and commercial learning-focused offerings in streaming and statistics services, which previously were found to be chiefly fan-made. Another difference is the importance participants gave to meta-cognitive and meta-learning processes and skills like identifying knowledge gaps, deliberation, or learning to learn. This matches literatures in professional education and sport expertise on the importance of reflection and deliberate practice (Macnamara et al., 2014; Mann, Gordon, & MacLeod, 2009), suggesting Esports as a potentially fruitful focal object for knowledge travel between these fields and game learning.

We readily acknowledge that our sample is small and very homogeneous and our findings to date quite abstract for the purposes of informing learning support. In planned future work, we will engage a more diverse sample of players in contextual inquiry on one particular area of learning needs that also emerged from the data, namely the transition of single-player human-vs-bot to multiplayer human-vs-human play.

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