The Rise of High School Esports: A Landscape Analysis of US Programs

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Abstract

Esports, or organized videogame competitions, are growing in popularity on college and high school campuses in the US. Not only have varsity esports teams emerged on university campuses, many with athletic scholarships attached, but also competitive high school esports teams and leagues – many of which claim potential positive outcomes for youth who participate despite somewhat broad public skepticism about this new form of media engagement. Relatively little is known, however, about the structure, goals, and perceptions of such programs. Toward these ends, we conducted an investigation into high school esports leagues in the United States in order to understand current attitudes and approaches to esports in high school. Using census interview methods with leaders of all known American high school esports programs in the US, we examine the perceived benefits and risks of esports in high school, the goals and barriers of such programs, and the emerging structure for participation among youth. Based on these data, and given the pedagogical issues raised by the emergence of this new form of interaction with videogames, we then outline a set of recommendations for such programs and a broad research agenda as to their value for kids.

Esports, or organized videogame competitions, are exploding in popularity worldwide. In 2017, the World Championship of *League of Legends*, a multiplayer online battle arena game, more than doubled in viewership over the past four years, from 27 million viewers in 2014 to 57.6 million viewers worldwide ("Number of unique", 2018). This period of accelerated growth comes after foundational work of building communities and infrastructures for competition and spectatorship on regional, national, and global stages. The Korean e-Sports Association, for example, was launched by the South Korean government in 2000 in coordination with South Korean technology and gaming industry executives for "regulation and organization" (Taylor, 2012, p. 25) of professional players and tournaments. On the local, grassroots side of esports, *Super Smash Bros. Melee* (HAL Laboratory, 2001) players were organizing tournaments in their own houses to foster their competitive community by 2002 (Smith, 2016).

As public interest in esports grows, so too does interest from colleges, universities, and, increasingly, now high schools (Bauer-Wolf, 2019). Here, the United States is generally in the lead, ostensibly given the stronger presence of game design and development programs and games research in higher education (Higher Education Video Game Alliance, 2014). Since the first college varsity esports team was announced at Robert Morris University five years ago (Tyson, 2014), there are now 179 institutions of higher education with varsity esports programs in North America ("List of Colleges", 2020), up from 126 in 2018 (Morrison, 2018), many offering athletic scholarships to students in a manner similar to traditional sports scholarships. Collegiate championships are broadcast live from the same studio as professional matches (LoLesports Staff, 2019), giving players and students a championship stage to which they might aspire and a better understanding of the roles and skills necessary to produce a high caliber tournament.

In keeping with university trends, we now see the emergence of high school esports teams as well (Schwartz, 2018). While efforts to organize competitive gaming between high schools existed five years ago, they were few and student-run. Today, companies and philanthropic organizations compete for exclusive rights to run official high school tournaments in US states (Pierce, 2019; Tiell & Cebula, 2020). To date there has been no systematic review of esports programs for youth (Reitman, Anderson-Coto, Wu, Lee, & Steinkuehler, 2020), yet their sudden increase and, in some cases, association with formal education, presents a variety of questions, opportunities, and challenges. Despite more than a decade of research documenting potentially positive academic benefits of gameplay (Clark, Tanner-Smith, & Killingsworth, 2016; Plass, Mayer, & Homer, 2020; Squire & Steinkuehler, 2014; Young, et al., 2012) and a growing research corpus indicating that cooperative (and cooperative competitive) game play has pro-social benefits (Kovess-Masfety et al., 2016; Velez et al., 2016; Steinkuehler & King, 2009), parents and administrators often question the merit of videogames at home, let alone in a school sanctioned setting, citing their violent content, addictive behavioral patterns, and toxic gamer culture (Prescott, Sargent, & Hull, 2018; Van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011; Consalvo, 2012). In the specific case of esports specifically – most commonly, collaborative teams competing against one another in league structures under the rubric of sports – we have very little research to rely upon to help media scholars, designers, and educators think through the scope, structure, rationale, and potential effects of structured competitive gameplay associated with educational institutions.

As a first step toward better understanding these issues, we investigated high school esports leagues in the United States in order to understand current attitudes and approaches to esports in high school. Using census interview methods with leaders of all known American high

school esports programs in the US, we examine the structure, goals, and perceptions of existing programs nationwide. In this paper, we review the emerging relevant literature, describe our methods of investigation, and then detail our findings in terms of the emerging structures for participation among youth in this space, the goals and barriers of such programs, the perceived benefits and risks of esports in high school are reported by their proponents, and the pedagogical issues these findings raise. We then attempt to outline a set of initial recommendations for such programs and a broad research agenda investigating their import for students, institutions, and the public. Our hope is that this early landscape scan and analysis will be of use to media scholars interested in this nascent domain and media program designers for youth (educators, administrators, and other community organization leadership) currently considering program development to capitalize on this new trend.

Literature Review

To date, research on esports has primarily focused on relationships between spectatorship, play, and identity; player and team performance; how esports expertise is constructed; and categorizing and understanding esports in terms of traditional sports and media (Reitman et al., 2020). These topics are studied across a variety of academic fields including "business, cognitive science, informatics, law, media studies, sociology, and sports science" (p. 33), and each year sees more peer-reviewed articles published on the topic of esports (Reitman et al., 2020).

Broadcasting and Streaming

Convergence, particularly, has recently highlighted conversations around spectatorship and livestreaming in esports (N. Taylor, 2016; Egliston, 2019; Witkowski & Manning, 2019). This work discusses the relationships between broadcasting, spectating, and competing from three perspectives. N. Taylor (2016) describes how competitive players interacted with the camera with intentionality from their own perspective, emphasizing the value those players placed on having an audience and performing for that audience. Egliston (2019) also analyzes interactions between players and broadcast technology, but the players in focus in his work are those viewing the broadcast. To be clear, these are not mutually exclusive; players who broadcast their own performance may also watch broadcasts of other players, but each perspective helps deepen understanding of the ecosystem around play, performance, and spectatorship. Witkowski & Manning (2019) build on this conversation with an approach that examines how the practices of streaming and playing at a high level of competition differ between communities of different games. The emphasis here on an appreciation of how varied a culture of performance and spectatorship can be from one community to another adds context to N. Taylor's (2016) and Egliston's (2019) player-centric analyses.

Broader conversations around broadcasting and streaming technologies in esports include how real social interactions and virtual worlds meet on streaming platforms (Burroughs & Rama, 2015), the labor and lifestyles of professional streamers (Johnson & Woodcock, 2019), the influences of streaming on in-game behavior (Matsui, Sapienza, & Ferrara, 2020), and how streaming and spectating fit into the esports ecosystem (Wohn & Freeman, 2020). Taylor (2018) summarizes the evolution of esports broadcasts in three waves of how the producers approached their product: first as a game, then as a sport, and now as media entertainment (Taylor, 2018, p.

136-137). During this third wave, Twitch.tv has become a central facet of many players' and fans' routines. Burroughs & Rama (2015) identify this centrality of streaming to competitive gaming as a cultural shift. This shift has, according to Johnson & Woodcock's (2019) interviews with streamers, brought the past experience of each individual streamer to a central platform in Twitch.tv, creating a profession with certain necessary core competencies but a diversity of paths through careers. For players specifically, Matsui, Sapienza, & Ferrara (2020) found that streaming while playing can negatively impact in-game performance, which emphasizes the discrepancy between the skills necessary for competitive play and the skills necessary for entertainment on-stream. This dichotomy highlights the variety of roles in the esports ecosystem beyond play, through which high school esports participants might build relationships and skills.

History of Esports

In the history of organized, competitive gaming, these media-centered considerations are not new, despite how different the esports ecosystem looks now compared to "the first eSports tournament" of The Intergalactic Spacewar Olympics in 1972 (Scholz, 2019, p. 20) or the competitive arcade scene of the 1980's (Taylor, 2012). Taylor's (2012) recount of that history details the development of organized, competitive gaming from arcade cabinet leaderboards to government- and corporation-sponsored, professional competition (Taylor, 2012). At the end of that recounting, Taylor notes, "One of the interesting things about e-sports is the way it is constructed across national lines but still quite rooted and shaped by local contexts" (Taylor, 2012, p. 243). This facet of esports stems even from the spread of digital games dating back to the 1950's presented at the World's Fair and international trade fairs (Scholz, 2019, p. 19). It is only more recently, since widespread development and adoption of networks that can send data between computers fast enough to accommodate competitive games, that localized communities can interact through play without travelling to live events and conferences. While Taylor (2012) describes gatherings in arcades to compete for high scores on specific machines, professional and collegiate esports leagues can now inspire community through localization in cities and on campuses and also foster global community through international competition. It is in this mix of local and global community that high school esports programs are being developed. While implementations of school-affiliated esports can learn from traditional sports and competitive gaming alike, this simultaneous evolution of esports on intensely local and intensely international stages may offer unique connections between international high school programs (LaBeaux, 2019).

Competing Teams

As esports gain visibility, some researchers are leveraging the competitive environment to examine team behaviors and characteristics that correlate with in-game performance. Parshakov, Coates, & Zavertiaeva (2018) highlight the importance of diversity amongst teammates but also point out the necessity of distinguishing between different kinds of diversity. In their examination of how cultural, linguistic, and skill-based diversity influence team performance in *Counter-Strike: Global Offensive* (Valve, 2012), Parshakov, Coates, & Zavertiaeva (2018) found significant relationships between all three kinds of diversity and overall team performance as measured by tournament prize earnings over three years. Only diversity of culture, however, predicted higher earnings. Diversity of language and of skill both

predicted lower earnings, emphasizing the need for consistent operationalizations of diversity. Illustrating how scientists can approach esports as a new context in which to test existing measures, Kim, Engel, Woolley, Lin, McArthur, & Malone (2017) bring the construct of collective intelligence to bear on team performance in *League of Legends* (LoL) (Riot Games, 2009). Their findings that higher ranked LoL teams also perform better on the previously validated Test of Collective Intelligence (Kim et al., 2017) confirm both the instrument's reliability across domains and the fact that esports teams benefit from some of the same characteristics as previously studied teams of other domains.

Toxic Culture

Despite the potential benefits of participating in these communities, problematic social behavior can also pervade online games. In a summary of perhaps the most well-known example of unapologetic and outspoken sexism around games, Shaw (2014) emphasizes how this aspect of gaming culture can limit who participates in videogames and forums:

> When it comes to issues of participation, this jerkiness can directly affect who can take part in online discussions and cultural production. When Anita Sarkeesian started a project aimed at documenting the problematic representations of women in videogames, her Wikipedia page was vandalized, she was sent (and continues to receive) rape and death threats, images were posted of her being raped by videogame characters, and a flash game was created that allowed players to "Beat Up Anita Sarkeesian" by clicking a picture of her until it turned into a bloody pulp" (Shaw, 2014).

Ratan et al. (2015) demonstrated that the underrepresentation of women in competitive gaming cannot be attributed to gender differences in skill acquisition. Their work found no significant difference between how quickly men and women improved their in-game skills as measured by an in-game ranking system and API data, yet they found that women were less confident in their own ability through survey and interviews. These findings emphasize the role of the social context around a game in the selection and self-selection of who pursues higher levels of competition. What does that social context look like? Kwak, Blackburn, & Han (2015) collected data from reports of disruptive behavior in LoL and the repercussions decided on by the crowdsourced tribunal in charge of screening these reports. Among their findings, Kwak et al. (2015) note both that players are hesitant to report bad behavior unless explicitly asked to do so and that the team-based competitive design of LoL might encourage blaming poor performance on others. In this context, then, players can be quick to blame others, slow to report disruptive behavior, and seemingly expected to approach the game differently depending on their gender.

That online gaming culture harbors such toxicity might be the greatest hurdle facing students, educators, and researchers hoping to leverage games for learning. Consalvo (2012) even calls for researchers for orient their work around this central issue:

> How can scholars interested in videogames and gamer culture as well as the equal treatment of women in this space make a contribution? I believe this is an opportunity to demonstrate the usefulness of research and particularly how it can help to give us a firm foundation on which to stand in order to shed light on the persistence of particular issues, point to historical solutions for overcoming similar difficulties, and thereby push for a more welcoming kind of game culture for everyone – not simply girls and women players. (p. 2)

And they have. Researchers have provided detailed examples of games and game-based curricula that show promising potential to engage students and encourage empathy. Boltz, Henriksen, Mishra, and the Deep-Play Research Group (2015) describe games like *Papers, Please* (Pope, 2013) and *Migrant Trail* (Williams, 2013) as "immersive experiences that allow players to build empathy and inhabit perspectives different from their own" (Boltz et al., 2015). Games allowing empathy development is encouraging, but high school esports programs teaching students "how to collaborate, how to communicate, how to value and respect their team members" (Hennick, 2019) could be the support structure necessary to turn that potential into a well-defined learning goal.

The Collegiate Scene

Much of the work of understanding esports culture at a finer grain has occurred in the context of the growing collegiate esports scene in the States. Pizzo, Jones, & Funk (2019) discuss the connections to traditional sports development on college campuses through findings from a series of interviews with 16 directors of collegiate esports programs, including both directors from athletic departments and those in student affairs. Those interviews found that collegiate esports program creators in the US strategize around "(1) structure and resources, (2) imagery and branding, and (3) alignment with existing values of athletics" (Pizzo, Jones, & Funk, 2019, p. 179). Regardless of the home department of the director of the program, Pizzo, Jones, & Funk (2019) these strategies usually rely on athletics department resources and brands. Kauweloa & Winter (2019) findings from interviews with collegiate esports players emphasize the novelty of school-affiliated structure for these players. As colleges partner with and recruit from high schools, this structure also has the potential to impact high schoolers' experiences. That interaction makes investigating the existing goals of barriers in high school esports a necessary step toward understanding how relationships between college and high school programs might support participating students.

The High School Scene

While classroom curricula that incorporate games – competitive or otherwise – are far from the norm, esports' potential in secondary education has not gone unnoticed. Educators like Washburn and Isaacs (2018) are working to build the knowledge base necessary to take advantage of the learning potential of competitive gaming, and Schwartz (2018) noted that the North America Scholastic Esports Federation (NASEF) "has seen a decrease in school absenteeism among participants," in addition to explaining some of the career opportunities these programs can lead to for students. Understanding how high school esports are currently organized and what influence they may have on student participants will give communities an opportunity to take advantage of the growing popularity of esports to promote academic, professional, and personal development. In fact, comparing adolescent boys' behaviors in games "to several Common Core as well as International Society for Technology in Education (ISTE) Standards" (Engerman, 2016), Engerman, MacAllan, & Carr-Chellman (2014) found that these players build and practice skills through and around these games that schools aim to train. The

context of organized, competitive play, however, can impact how students approach their games, as evidenced by Witkowski & Kim's (2019) juxtaposition of how the 2018 Australian High School *League of Legends* Championship was accepted in schools and how students in Hong Kong have struggled to find support for competitive gaming in their high schools. While students in both cases muster organizational and social agency in their pursuit of competitive gaming, those in a context with school support offers an opportunity to experience the professional side of esports through the production of the championship and connect the skills they are building around the game to skills and careers they might pursue after high school.

Methods of Investigation

In this investigation, we conducted census interviews with leaders of all known American high school esports programs. Census interviews are a variation on survey interviews (Singleton & Straites, 2002) but where *all* members of a population (here, individuals representing formal high school esports programs in the US) are interviewed rather than a sample; this approach was used since the population of programs was small enough to render data collection across the whole population possible. Here, we defined a "high school esports league" as any high school program in the US comprised of (a) at least one team affiliated with a public or private school and (b) competition between at least two teams so as to exclude informal "one off" invitationals that had no persistent presence outside a single event. Programs were identified using a three-step process. First, we conducted an online search using combinations of keywords and the Google search engine, including *high school*, *esports*, *videogame*, *league*, *tournament*, *competition*, *varsity*, *invitational*, and *club*. Once a master list of programs was compiled, we contacted leadership at each program via email to solicit interviews. To ensure a comprehensive data set, we then asked each participant recruited for additional recommendations of esports programs targeting youth. This snowball sampling method helped ensure the inclusion of programs with less web presence, of whom we would otherwise not have been aware. The final participant pool includes a population of eleven (11) programs total that collectively report coordinating and supervising 6,448 high school esports teams, both regionally and nationally.

Table 1 details the population included in this investigation. Of the eleven programs included in this investigation, five (5) focus on development of a national presence (grey rows) and six (6) focus on development of local, regional programs (white rows)– three (3) on individual school programs, two (2) on district wide programs, and one (1) on a state program.

In order to understand the goals and methods of each program, we interviewed at least one individual in a leadership position in each of the eleven programs using a semi-structured protocol. The interview protocol (Appendix) consisted of questions related to the interviewee's program goals, origins, relationship to formal educational institutions, challenges and successes, scholastic ties, justification and rationale, parent reception, geographic area(s) served, participant demographics, logistics (time, location, frequency, transportation), community context, student roles, and chosen game title(s). An open item question format was also included to insure we had not missed any other main issues and details that the interviewee felt were important.

Ten interviews were conducted by phone or through a video call application; one interview was conducted face-to-face. All research was approved by the University Institutional Review Board with participants giving verbal consent at the beginning of each interview. One researcher conducted all interviews in a private space and at the convenience of each participant.

Each interview lasted between 30-60 minutes and was recorded and transcribed with field notes taken throughout.

Findings

Table 1 overviews the high school esports programs currently running in the US in terms of their structure and focus. In this section, we describe trends in the program structures offered, the perceived benefits of esports in high school, and frictions and barriers reportedly faced.

Table 1. Overview of HS Esports Programs in the US

	Top-down/ Bottom-up	Local/ National Focus	# of Member Teams	League Structure	Total Season Prize Purse (across all games)	Student Roles
Current High School Starleague	Top-down	National	–	–	–	–
High School Esports League	Top-down	National	502	Seasons & playoffs	50,000 USD	Internships
Youth Esports of America	Top-down	National	59	Seasons & playoffs	20,000 USD	Internship, community managers
Electronic Game Federation (EGFH)	Top-down	Local	81	Seasons & playoffs	–	Coaches, analysts, managers
North America Scholastic Esports Federation (NASEF)	Top-down	Local	38	Seasons & playoffs	4,750 USD	Casters, community board members
PlayVS	Top-down	National	5,000	Seasons & playoffs	–	–
Eastern Pennsylvania High Schools (PA)	Bottom-up	Local	1	–	–	–
Guilford High School (IL)	Bottom-up	Local	1	–	–	–
High School Esports Training Camp (TX)	Bottom-up	Local	1	Invite tournaments	–	–
Racine Unified School District (WI)	Bottom-up	Local	15	Seasons & playoffs	–	Coaches, managers, analysts, casters
Early High School Starleague	Hybrid	National	750	Seasons & playoffs	20,000 USD	Event organizers

Program Structures

Top-down national versus grassroots regional. Programs we interviewed took two major approaches to building high school esports leagues: (1) the creation of a central organizing and governing body that schools register with to participate in competitions and events and (2) efforts within individual schools to create clubs and teams that build into a larger league. Interviewees referred to the former as a top-down approach and the latter as a bottom-up approach. All of the five programs focusing on developing a national league utilize a top-down approach, while four of the six locally focused programs formed through a bottom-up approach (Table 1).

The uniformity of programs with national goals points to a necessity for a single locus of organization to determine competition styles and rule sets for large numbers of teams across the country to enjoy an even playing field. That said, the value of individual schools building upon their own esports communities before signing on to an overarching league structure can be seen in the opportunities for developing and customizing a program for a given student population without having to worry about coordinating schools in different states or finding funding for the staff required to organize a league on the scale of traditional high school sports leagues. The viability of either approach on the local level is evidenced by programs with a local focus finding success with both.

Only one program took a combined approach in which students and faculty came together to form clubs and teams and convince students and faculty at other schools to do the same. In this case, the founding members from the initial school took on roles organizing both their own school's team and the teams of other schools to create a joint competitive league over time. In the words of this hybrid program's leadership, "We need to meet in the middle... It's easier to find bottom-up approaches, but if you want to take esports to the traditional sports level of infrastructure, that's a top-down mission" (Wang, Early High School Starleague).

League structures. Every program with enough participating teams uses a common season-based league structure. These multi-stage tournaments begin with a regular season in which teams play weekly matches. Depending on tournament style, matches are either against teams with similar records in previous weeks or against each of the other teams in their region or subgroup.

While having teams with similar records compete during the regular season can encourage competitiveness in each match, it also at times results in schools from across the US who have never heard of each other facing off. The opportunities for remote competition are often seen as a benefit of esports, but this model comes with its drawbacks: students often prefer to compete against their local rivals with whom they have a history of competition through traditional sports. Such local competition can be a source of school pride and help to make esports more accessible to outside audiences unfamiliar with the games. A second potential risk of remote competition is lack of player engagement. Programs that pit far away teams against each other report that community support suffers and, with it, participant interest. When students participate solely for the competitive experience, a pattern of apathy after losses can arise. As the High School Esports League reported, "at first one of the big challenges was there was a lot of apathy." Changes to the league to involve community members (teachers) proved useful in better engaging the local community overall. Even in league structures in which teams never see their opponents face-to-face, building up local community participation and spectatorship, it is reported, can encourage greater student engagement.

In contrast, tournaments that group teams by region take advantage of local rivalries but run the risk of having a greater number of one-sided matchups, which can prove discouraging for

players and spectators alike. Competitiveness is important to players, yet programs must also account for the fact that events attract a wide range of skill levels. Dr. Hannah Gerber (High School Esports Training Camp) reported that one viable solution their program considered was to "focus on players of a specific skill level," allowing multiple competitions among teams matched a priori on skill. Here, the drawback is the resulting need for multiple simultaneous league brackets to cover each skill level. Whether or not such solutions are viable remains to be seen.

Most commonly, teams that perform best in a regular season of competitions then advance to postseason playoffs consisting of a single-elimination bracket of 16 or 8 teams total, depending on the size of the league overall. For clubs without enough nearby teams to run a full league, hosting standalone tournaments and inviting students from surrounding schools to participate fulfills the need for a competitive space. This style of competition is more common among newer grassroots or "bottom up" programs because they simply do not yet have a large enough network of schools to compete against. Such "invite tournaments" give local high school esports communities an event to organize around while nearby schools with esports interest but no commitment develop their own competitive teams. Such tournament events increase community outreach and allow participating students to experience the "value of competition as a positive factor towards growth ... [in terms of] how do you come back from failure? How do you learn? How do you make the changes needed to be successful?" (Gerber, High School Esports Training Camp). In this sense, competition is more than just a definitional aspect of esports – it partially justifies the adoption of such programs in high schools by suggesting tangible benefits to participating students.

Game selection. How do high school esports programs select their game titles? Leadership across all eleven programs reported three main questions that served as criteria for game selection: (1) What do organizers, educators, and students agree to as appropriate for high school competitions? (2) What are the most popular esports titles among student populations? (3) How many games is the program willing and able to support? Less central criteria that vary across programs included: whether or not sponsor funds or prize money is available for a given title in a game, program staff and leadership level of expertise in a given game, and whether the competitive structure necessary for a given game genre is actually feasible for the program.

The number of game titles that programs support ranged from 1 to 14 with a mean number of 3.9 games per program and a median of 3 games per program. *League of Legends* was the most common game title selected and was included in all eleven programs investigated. Additional titles included in more than one program, in decreasing order of prevalence, include: *Overwatch*, *Counter-Strike: Global Offensive*, *Hearthstone*, *Super Smash Bros.*, *Rocket League*, *Dota 2*, *Paladins*, and *Smite*.

Which and how many games a given program was willing to officially support reflected the goals of the program. Programs focusing on a single school and growing through a bottom-up grassroots approach were unable to manage more than a few games given staffing, funding, and organizational constraints. Programs with a local focus but a more top-down structure kept their pool of included game titles purposefully low in order to focus their resources on creating unique competitive experiences for students. The two programs investigated that support competition in more than four game titles total both cited a desire to attract and serve as diverse student populations as possible as their main rationale. Different game titles attract different

demographics of players; thus, a broad offering of titles was seen as most effective for building a diverse pool of program participants.

Prize purses. All programs that award monetary prizes for tournament success do so either in the form of scholarship money for players or money awarded to the winning team's high school. Prize amount fluctuates year to year as funding and sponsorship changes. In the programs with more consistent sources of funding (e.g. public school district grants, state funding) and/or industry partnerships (e.g. streaming platforms, game developers), student participants can rely on scholarship money in return for successful playoff runs. Program leadership we interviewed reported that using prize purse rewards toward student education has gone a long way toward convincing skeptical schools and parents of the merits of their programs. Of those programs investigated, three offered scholarship funds totaling between $20,000 and $50,000 as prizes in their last season and one offered payouts totaling $4,750 to the winning teams' high schools. Currently, scholarship funds won through competition have not been tied to any one institution of higher education; that may change if collegiate esports programs increase scouting efforts and form closer relationships with high school programs.

Student roles. While there are myriad ways to participate in amateur and professional esports communities outside of high school, only four of the programs investigated included forms of participation for students beyond competitive team roles. Of those four programs, the most common non-team position offered was community manager. If appropriately resourced, student community managers are well-positioned to foster engagement among their high school in ways that an adult or outside employee might otherwise find challenging. Less common non-team positions available to students across esport programs included the roles of coaches, analysts, and team managers. Two of the eleven programs investigated included staff coaches hired as program staff or, alternatively, by participating high schools themselves; More commonly, coach positions in such programs are filled by volunteer teachers or more experienced student peers. Only one program, the High School Esports League, formally hired peer coaches as program interns during each season, thus providing an additional route toward professional experience for participating students.

Perceived Benefits for High Schools and Students

Program organizers reported a range of perceived benefits for participating students and schools, including increased student engagement (in school and the broader community), the development of professional and academic skills, and social and emotional learning (SEL). Yet each leader interviewed reported that their initial program offerings were first met with skepticism and concern. Community recognition and understanding of the potential value of esports for their high school and the possible benefits of participation for their students can go a long way toward program success. However, those interviewed reported initial reluctance from both school and community stemming from "an oversimplification or stereotype that, if you decide to embrace videogames, that you are encouraging students to waste their time on something that isn't going to do anything for them in the long run" (Electronic Game Federation). Here, we detail the reported benefits that, initially, appear overlooked.

School engagement. A 1995 Department of Education report on the effects of participation in clubs and school teams concluded, "It is clear that participation [in extracurricular activities] and [school] success are strongly associated as evidenced by participants' better attendance, higher levels of achievement, and aspirations to higher levels of education" (O'Brien & Rollefson, 1995). Across eight of the eleven esports programs investigated, increased student engagement in school was the primary driving factor for program development. Many leaders interviewed detailed their effort to bring an area of passionate student interest (esports) to institutions that have traditionally shunned them. Program leaders saw their programs as engaging students who are often otherwise disengaged in traditional sports, extracurricular activities, and even school itself. As a Director of Instructional Technology observed in schools in Illinois and Wisconsin, an esports program gave "kids an opportunity to connect with their schools in ways that they may not have before... There's a lot of students who would love to participate in things, but they just don't have a way to connect." It is just such students – those who have yet to find a meaningful connection to their school – who may benefit most from alternative sports like esports. Seven of the programs interviewed hosted social events that were carefully designed to welcome a broad array of students who may not otherwise engage in sports or clubs. As Youth Esports of America observed, "people create events together and bond as a club." Such joint participation was reported as key to fostering student engagement in school and community.

Academic and professional skill development. Esports may not only be a plausible way to get students engaged in school; they may also be a plausible way to engage students in academic work itself. While only one program investigated, the North America Esports Federation (NASEF), included a standards-based curricula for participating students, seven of the leaders interviewed asserted that their programs provide a context in which students can gain academic, technical, professional, and social skills. As High School Esports League noted, over time, participating students became skilled "managers, analysts, streamers, and casters" for their teams and clubs. Such roles required not only technical and professional skills but also "teamwork, communication, leadership, self-efficacy, [and] self-esteem" (Pennsylvania High School Program), skills valued in the workplace regardless of domain.

Interest-driven learning. Interest-driven learning has a long history in education, beginning with Dewey (1913) and running through Piaget (1945) and Vygotsky (1978) to more contemporary theorists (Papert, 1993; Gee, 2003) and theoretical frameworks (Connected Learning, Ito et al, 2013). From this perspective, one primary reason that esports programs may be effective vehicles for learning academic content is the fact that some students' take an avid interest in the topic already, one which naturally lends itself to connections to disciplinary knowledge and skills. As a founder and officer of the earlier High School Starleague commented, "esports allows technical, interest-driven learning... Every aspect of the educational world is involved, and it's a place to apply classroom learning." Four of eleven programs investigated stated that interest-driven learning was the primary reason to bring esports to schools. Leaders commented on their desire to motivate participants to solve real world, authentic problems in a context and to build skills related to their own experiences and interests. An executive of Youth Esports of America argued that the out-of-school context may well provide more access to ideas rather than less, stating "It's not as intimidating to them [high school students] to learn something new in this technological space."

Social and emotional learning. Social and emotional learning (SEL), the development of self-awareness, social awareness, relationship skills, self-management, and responsible decision-making, is "as critical to development and school success as academic instruction" (Applied Learning Sciences Division, 2017). Across the programs investigated, SEL was recognized as one important benefit of involving students in esports in a school-affiliated and mentored way. From general observations of players growing in "character, teamwork, and perseverance" (Early High School Starleague) to the incorporation of specific activities and support structures "to help these students realize the impact of their words, because ... we're building the future gamer" (NASEF), leaders note the opportunities they see for high school esports programs to foster and improve SEL among their students in a space otherwise known for toxicity among some players in response to competition, observation, and stress.

Co-ed teams. Other SEL-related benefits mentioned were the opportunity for coed team building, increased student retention in school, and the shifting role of school athletics directors to school *activities* directors, creating a more equitable and level playing field across student sports and clubs generally. This unique opportunity for co-ed team building was viewed as a particularly exciting prospect given the limited opportunities for students of different genders to collaborate and compete in traditional athletics. Currently, the demographics of collegiate and professional leagues skew heavily male, giving high school programs a chance to play a catalytic role in the reshaping of the competitive esports pipeline.

Frictions and Barriers

Leaders of these earliest efforts to bring esports into high schools have encountered common areas of friction in implementing their programs. The most commonly described barriers to esports in high schools include parental and societal concerns about esports (and videogames more generally) and challenges gaining access to and support from schools themselves.

Parental and societal concerns. Parent, teacher, and school administrator support for a program is the difference between success and failure in any afterschool program. When important stakeholders and gatekeepers have reservations about competitive videogame play for youth, program organizers must be able to convincingly communicate how feared risks are mitigated and even possible benefits. Eight of eleven programs detailed difficulties in gaining parent, teacher and administrator support; some shared their successful strategies for addressing the concerns. High School Starleague learned that students "will go to the teachers who already have some idea about gaming," and therefore empowers student participants with "making faculty listen." PlayVS reported efforts to onboard teachers directly, explaining "teachers care about their students. We just need to explain education outcomes to convince them." In the end, each program investigated found at least partial solutions to the problem of stakeholder skepticism, relying on the possible benefits of programming and relevance to kids to persuade administrators, teachers, and families.

The skepticism facing youth esports programs can be seen as part of a much broader skepticism about videogames and gamers more generally. Stereotypes of gamer culture as toxicity and intolerant and of gamers as lazy and antisocial are common – so much so that one

esports league, the Youth Esports of America, set "chang[ing] the stigma around what high school gamers look like" as an explicit goal of the program itself. For one program investigated, NASEF, toxic behaviors in the club serve as teachable moments in which coaches, teachers, and peers can mentor and shape the root issues of self-awareness, social awareness, relationship skills, self-management, and responsible decision-making – just the SEL skills that esports programs purportedly have the capacity to help build. "A lot of the students know; they just don't talk about it. They don't talk to their friends about, 'you know your username's kind of problematic.'" (NASEF). For participating students, such instances provide an opportunity to give and receive feedback on their conduct for a more experienced peer or mentor that few ever encounter in online gaming contexts in the wild.

Health concerns are also common among parents and worth discussion. While the value of screen time limitations for youth remain hotly debated (White, Schofield, & Kilding, 2011; Lauricella, Wartella, & Rideout, 2015; Hale & Guan, 2015), concerns over youth and media consumption remain. Program leaders interviewed in this investigation suggested addressing concerns directly rather than ignoring them. In a teacher's words from an active Pennsylvania high school, "we have to have the conversation about healthy relationships with digital media." Such conversations can expand beyond the topic of screen time to give parents, administrators, teachers and even students themselves an opportunity to share perspectives and find common ground.

***Program professionalism*.** Given the novelty of high school esports programs, inexperience and under-preparedness among leadership and staff remain shared concerns. Not all program staff can be expected to already have experience in esports or established expertise in adolescent development and learning. Interviewees commented on the importance of youth programs having a clear mission related to youth development, actionable plans for addressing anticipated risks, and professionalism among students and program staff. Leaders commented that, given the nascency of esports in the US generally, unprofessionalism on the part of a single program could well have negative effects across the entire high school esports ecosystem, including and especially participating students themselves "Unprofessionalism has put a bad taste in a lot of people's mouths… Leagues need to understand that it affects not just us, but it affects the students as well. If you do a bad job it's going to push back esports in high schools as a whole for everybody," (High School Esports League).

These barriers to successful implementation detailed by our respondents may make the high school esports space a difficult domain within which to work. In what followings, we describe a number of recommendations that emerged from the data for current and future such programs. Our goal is to level up the professionalism of youth esports programs overall.

Discussion and Recommendations

Leaders of high school esports programs in the United States report that organized esports programs can indeed be a vehicle for positive student engagement and learning. The most common barriers such programs face are skepticism and concern from parents, teachers, and administrators. Those same community members, however, can become the much-needed support for program implementation if the benefits of such programs are well articulated, the concerns are discussed and addressed, and program staff and students are professional and well-

organized. How might organizers go about meeting these conditions? What topics might researchers study to support work that benefits students? As part of our interviews, we asked leadership directly for advice for educators, organizers, and researchers interested in launching and studying similar programs. In this final section, we highlight their most frequent recommendations.

Combine strong engagement at the local level with a stable central organizing body that connects them. Associating esports teams and clubs with local individual schools or educational non-for-profits (as opposed to non-scholastic for-profit entities) better ensures that programming unfolds in a context already attuned to the scholastic and social-emotional needs of youth. Contextualizing esports programs within the domain of youth programming more generally ensures that program focus remains on school engagement, academic and professional skill development, interest-driven learning, and social and emotional learning – not just competition or profit. Here, a central organizing body is crucial to establish the competitive league structure for games and overall legitimacy and accountability for programs involved. It also sets expectations of equality in competition and quality in communities and classrooms. As Jesse Wang (Early High School Starleague) argued, "we need one unifying organization that standardizes high school esports. People wouldn't participate so much in high school robotics competitions without NASA organizing them."

Engage and educate parents, teachers, and school administrators. Overt outreach and onboarding of school community members not only better inform key stakeholders but also better supports participating students, helping create a supportive social network for their activities that can prove crucial to ensuring their activities are beneficial. Programs should make the case for how programs connect to value and goals beyond the game and explain the "opportunities out there for someone who's pursuing [esports] ... and then outline the progress that's been made in college around scholarships and other opportunities that are available to students, and once you start to talk about those types of things rather than playing videogames it becomes a much easier conversation" (EGFH). Moreover, they should provide formal and informal supportive roles for teachers and parents. Mentors do not need expertise in esports to help shape students' experiences in activities in positive ways. For more than one program examined, a single teacher in the school willing to engage with and support the school's esports community has meant the difference between success and failure.

Let student interest drive key program decisions. Students can and should be allowed to take on leadership opportunities in helping shape key aspects of the program such as game selection, club roles, logo design and promotion, and event management. As Schrodt, (Electronic Game Federation) advises, "Coaches managers, analysts can all be student run... Try to fit in the opportunity for students wherever that is relevant or possible." Rather than colonizing the interest areas of students, program leaders can and should cede control of some programming to honor students' own interests. Balance here is key: Students can take the lead when supported and scaffolded by adult mentors. Maintaining interest as the driving force behind program design better ensures engagement in scholastic tie-ins and provides important leadership experience and opportunities for kids.

***Build closer relationships between high schools and colleges across the nation*.** Relationships between local high schools and institutions of higher education underscore the academic value of programming and expose some students to aspirations they might not otherwise consider. Collegiate esports teams and clubs are an important source for high school team coaches and mentors; esports athletes from nearby college campuses can serve as role models, advisors, content experts and more. As one program described, "university students are volunteering to help the high schoolers with their teams. They're working with them, mentoring them, and streaming... The kids are just amped about it" (High School Esports Training Camp). Programs in higher education also stand to gain from such relationships through the development of a pipeline of skilled high school players with an eye toward the collegiate level.

***Carefully consider the educational aspects of selected game titles*.** While it is imperative to select game titles that students actually want to play and compete within, it is also important to keep a sober eye out for titles that well align with program goals beyond competition itself. Inevitably, some esports titles will align better with program outcome goals than others. Balancing interest against suitability helps ensure that final game selections promote with targeted professional, academic and social-emotional benefits.

***Design activities and materials to foster professional and academic development*.** Potential benefits for youth esports participation do not necessarily arise on their own out in the wild without mentoring, scaffolding, and designed activities. Rather, thoughtful materials and activities can be used in after-school and out-of-school meetings, practices, and events to teach students related, important skills. For example, esports titles like *League of Legends* have natural connections to core standards in statistical reasoning, communication, and basic math. Programs can include thoughtful activities to promote knowledge and skills across a variety of disciplines and school subjects, appealing to a diversity of students and student interest. For example Dr. Diana Lee (NASEF) sees opportunities for "esports-focused English classes that get you interested in creative writing, journalism, or marketing; or learning to analyze and decode complex statistics about the games you play to improve your gameplay ... while building the skills to collect, manage, utilize, and communicate relevant information within a networked community." Making good on the claims about the benefits of esports programming for youth means designing to promote them.

***Emphasize the development of social and emotional learning*.** Promoting social-emotional learning through in-game teamwork and out-of-game community and club interactions and cultural norms is a necessary prerequisite to any program claiming that esports can be a positive playspace for kids. Programs can and should emphasize SEL development to ensure that programs do not inadvertently replicate the forms of toxicity sometimes found in public, unmoderated esports community (online) spaces. Here, youth programs hold much promise, not just for the social and emotional lives of participating students but also for raising the quality of esports communities, both amateur and professional, more broadly. Students trained and mentored in more productive, humane forms of online interaction may well help set a better precedent for online behavior to be passed down from one student generation to the next.

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APPENDIX

Interview Protocol for US HS Esports Program Leadership

What are your program's overall, academic, and competitive goals?
How did your program get started? When? Was it school-initiated?
Is your program operated out of a school/district, or is it run by an outside organization?
What challenges have you run into with this program?
What successes have you had with this program?
Does your program have scholastic ties?
What makes your program a school activity as opposed to any other club without scholastic ties?
What is the parent reaction to your program? How do you talk about it with them? How do they participate?
What geographic area does your program cover? School? School district? County? State? Where do participants come from?
What are the logistics of student participation (i.e. is it an after school program? Is there bussing? Do parents drive?)?
What is the community around your program like? How big is it?
Can students participate in your program in ways other than playing on a team (e.g. as shoutcasters, analysts, coaches, managers, publicity, social media)?
What games are included in your esports program?
What would you like to change about high school esports or your program in the future?
Who else do you know of trying to get esports started in high schools? Who else should I reach out to?
Is there anything I have not asked about that you want to talk about?