The Benefits of Academic Esports:

What the Research Says about Student Success

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September, 2021

MASTERY
— C O D I N G —

Introduction

No matter how it is evaluated—from the number of gamers across the globe to the billions of dollars flowing through the industry to the diversity of people and cultures who participate—the size, scope, and impact of esports on the world is irrefutable.

But can esports be of academic benefit to the world of K–12 learning? Our team will answer that question in this document. (Spoiler alert: the answer is a resounding YES!)

The world has around 2.7 billion gamers, and the industry of esports is a $175 billion multinational business.

As you will see in the material that follows, studies have shown that esports provide many of the same benefits as traditional sports, such as basketball, soccer, football, and baseball. Some of the similarly transferred positive correlations include the development of the following:

- **teamwork**
- **communication**
- **strategic Thinking**
- **sportsmanship**
- **leadership**
- **adaptability**
- **resilience**
- **tenacity**
- **self-regulation**

Our research also demonstrates that students receive a plethora of cognitive and social benefits, including the following:

- **improved hand-eye coordination**
- **enhanced attention**
- **elevated visual acuity**
- **amplified visual processing and executive function**
- **superior problem-solving development**
- **enhanced self-confidence**

And the list goes on...

The Research Base

For our paper, we curated data from more than twenty sources. Our conclusions are derived from scholars around the world. From Jan Plass, a professor at New York University, to J. Ronald Gentile, a teacher at University of Buffalo State University, to Samuele Marcora, a scholar at the University of Bologna, the materials herein are gleaned from an international array of university scholars. A complete list of scholars whose work we consulted is included in the appendix.

In this paper we will also show that some of the biggest names in tech are deeply involved in the gaming industry: Microsoft, Amazon, Google, Facebook, Unity . . . The list goes on and on.

But how big are esports in the United States? Three out of every four US citizens play video games—an estimated 244 million American gamers! Worldwide, there are an estimated 2.69 billion (that is billion with a B) gamers. As the data proves, the size of the audience is staggering.

So are the revenue dollars. As the following chart shows, gaming generates revenue through a variety of devices and media.
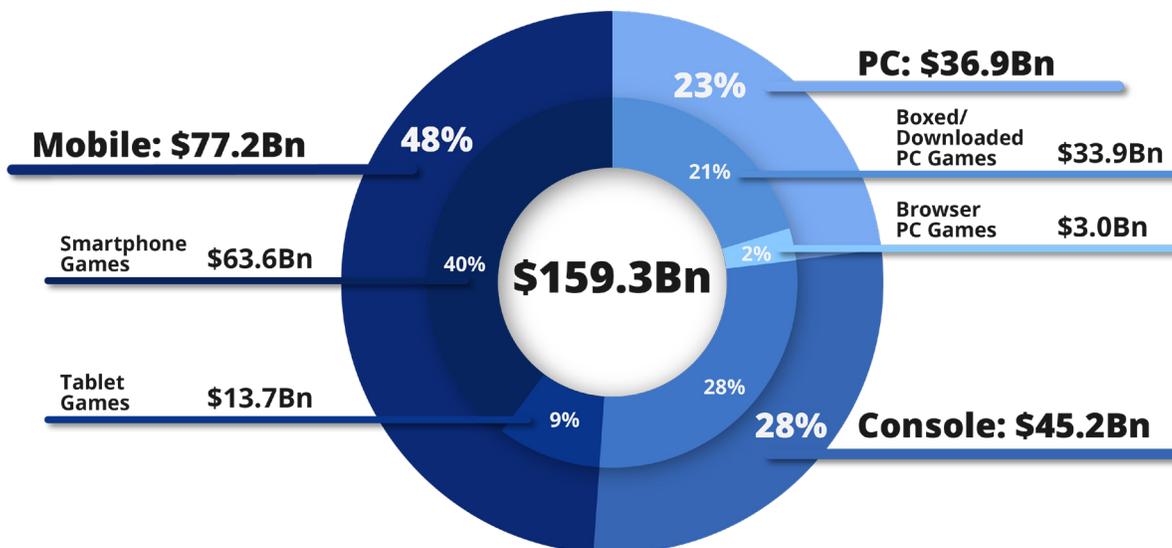

Table 1. Per Device & Segment with Year-on-Year Growth Rates (Newzoo, 2020)

Yes, esports have arrived. And with it comes the opportunity for students to benefit academically from their love of gaming. The research on this is quite clear.

Esports: The Landscape

As an industry, esports are generating a staggering amount of revenue, jobs, and entrepreneurial opportunities—and their growth shows no signs of slowing.

Esports has grown by an astounding 49% in the three-year span of 2019–2021, and the projected expansion of esports' popularity shows no signs of slowing. Some notable aspects about this growth deserve particular consideration:

Revenue in million U.S. Dollars

Year	Revenue
2019	957.5
2020	947.1
2021	1084.1
2024*	1617.7
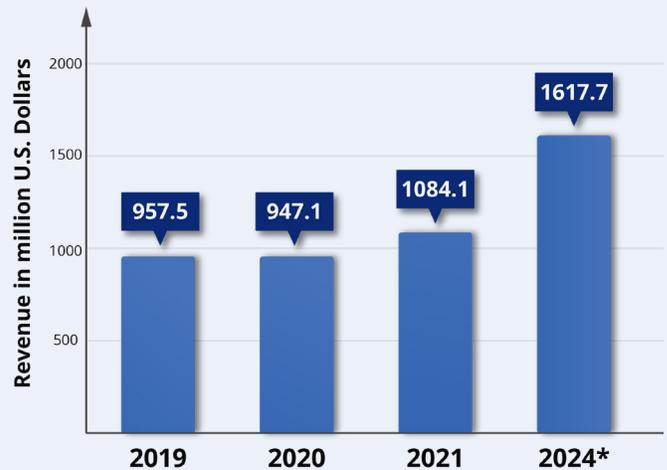
- According to Newzoo, global e-sport revenue will reach just short of $1.1 billion by the end of 2021, a year-over-year growth of +14.5% from 2020's $947.1 million.
- It is estimated that more than three-quarters of the total market revenue will come from media rights and sponsorship.
- E-sport broadcasters are "contending with marketers of traditional sports for the same coveted demographic" (Syracuse University 2019)[1].
- A huge increase in programs focused on developing STEM education, as well as college and career awareness services for youth, through esports has gained immense traction in the past few years, and trend lines indicate exponential growth in the years ahead.
- Almost three hundred colleges today feature e-sport scholarship programs.

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[1]. Syracuse University, "With Viewership and Revenue Booming, Esports Set to Compete with Traditional Sports," accessed January 18, 2019, LINK

Esports makes the Olympics

"With the launch of the Olympic Virtual Series in 2021, the International Olympic Committee took the first big step into the world of esports. For the first time, e-sport competitions were held at the 2021 Summer Olympics. The e-sport competitions were divided into the following disciplines:

- sailing: virtual regatta
- cycling: Union Cyclist Internationale
- rowing: open format
- motorsport: FIA/Grand Tourism
- baseball: World Baseball Softball Confederation - E-baseball Powerful Pro Baseball 2020"[2]

The acceptance of esports in the Olympics proves that the competitive nature of esports is justified and that esports is developing into something internationally accepted as a sport on par with traditional sports.

Esports and the Pandemic

While other large industries suffered during the COVID-19 pandemic, esports flourished. Although the pandemic affected the esports scene through the canceling and postponement of major events, which lowered the amount of merchandise and number of tickets sold, the number of esports players ballooned across the globe. This presented new revenue opportunities for companies facing a changed landscape. "Game makers, players and esports clubs have the opportunity to get resources from different areas. These are sponsorship, media rights, publisher fees, merchandise and tickets, digital, and streaming revenues."[3] These revenue streams can be seen directly in Figure 3.
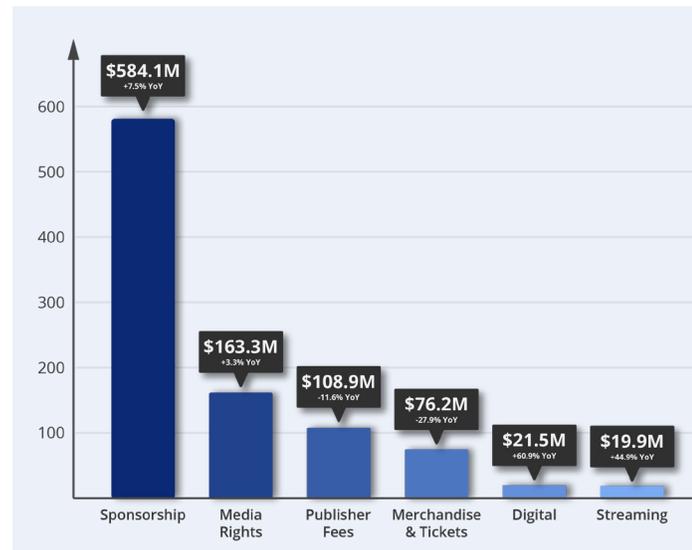

Figure 3. Esports revenue streams for 2020 according to Global Esports Market Report data (Newzoo, 2020)

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[2]. Constantin Duge, "Olympic Virtual Series: Premiere for eSports at the 2021 Olympics," ISPO, 2021, LINK
[3]. Ahmet Fakazlı, "The Effect of Covid-19 Pandemic on Digital Games and eSports," International Journal of Sport Culture and Science 8 (2020): 335–344, LINK.

Figure 4 depicts the viewership and interactions online for a popular racing game. The platforms being followed are YouTube and Twitch. YouTube is a platform in which music and videos are shared. Twitch also has music and videos, although its platform focuses on livestreaming. The viewership across both platforms saw an increase at the start of the pandemic.
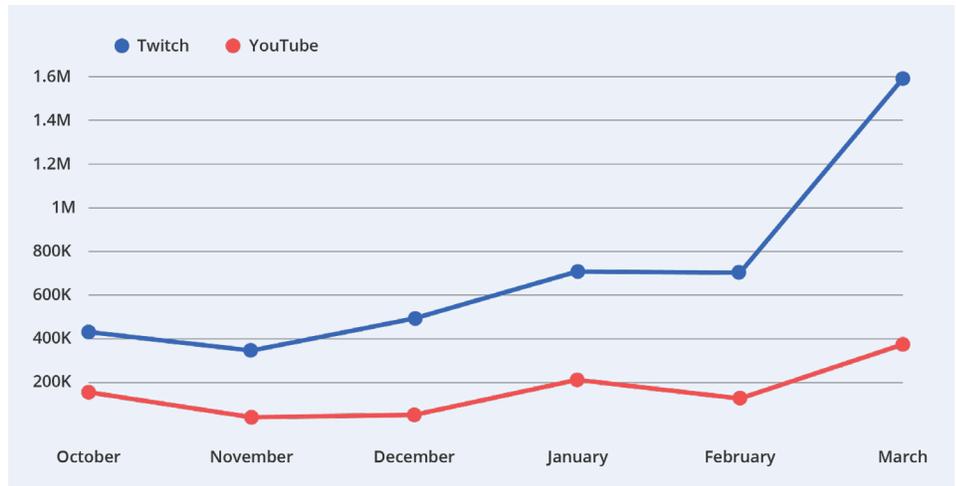

Figure 4. Number of viewers of iRacing between October and March (Jackson, 2020)

Twitch's viewer count doubled. This increase had many causes; however, the most prominent cause was that there were more people indoors seeking entertainment. "Unlike traditional sports, it can be seen as an important advantage that esports [are] digital and online broadcasts can be made. As a matter of fact, when Table 2 is analyzed, it is estimated "within the next 3 years that the streaming revenues will develop by 44.9%."[4]

Workforce Opportunities

Esports and video games are not just competitive opportunities—they are also career options.

Whether a person wants to become a professional player or create games, the video game industry is still a developing field with many opportunities. A 2019 study of graduated students who took some form of video game program in college found "84% of respondents stated that they were currently employed. This included full-time, part-time, and contract work as well as self-employment. The rate of employment increased with the age of respondents. For example, 70% of the youngest cohort of respondents reported being employed compared with 100% of the oldest cohort."[5] This research

Figure 5. Percentage of employed respondents by age (Higher Education. 2019)

demonstrates that with college interest in esports, job opportunities begin to present themselves.

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4. Ahmet Fakazlı, "The Effect of Covid-19 Pandemic on Digital Games and eSports," International Journal of Sport Culture and Science 8 (2020): 338, LINK.
5. Higher Education Video Game Alliance. 2019 Survey of Program Graduates. 2019. Available from: HEGVA: LINK

Esports and their Misperceptions

Now to debunk some of the common misperceptions surrounding esports and gaming.

01

Misperception: Competitive gaming may lead to an adverse effect on a students grades.

What the Research Says: NOT TRUE

In a study of over 1,500 students, "the results showed that more strategic video game play predicted higher self-reported problem solving skills over time than less strategic video game play."[6] Students who spent time developing their skills in team-based games grew in many ways, unlike students who spent their time playing individually. The opposite result can be observed: ultimately, the students

Shown above is popular, turn based, historical, strategy game Sid Meier's Civilization VI

with higher "self-reported problem-solving skills predicted higher academic grades." As a result, students who developed these twenty-first century skills received higher grades than those who did not.

02

Misperception: Violent Video games may lead to fostering more aggression in youth.

What the Research Says: NOT TRUE

Although there is a small increase in temporary aggression, the long-term benefits show that gaming has a more benefits than drawbacks. In a study of over 2,000 boys aged 10–19, participants were surveyed about their video game habits as well as their aggressive cognitions and behaviors. From this study, a similar phenomenon can be observed. Ultimately, the students playing more violent games tended to be less aggressive as "violent video games appear to be exemplary teachers [of managing] aggression."[7] The students who were able to directly express their anger in the video game were less likely to experience impulses of aggression.

6. Paul Adachi and Teena Willoughby, "More Than Just Fun and Games: The Longitudinal Relationships Between Strategic Video Games, Self-Reported Problem Solving Skills, and Academic Grades, Journal of Youth and Adolescence 42 (2013): 1041–1052, LINK
7. Douglas Gentile and J. Ronald Gentile, "Violent Video Games as Exemplary Teachers: A Conceptual Analysis," Journal of Youth and Adolescence 37, (2008): 127–141, LINK.

03

Misperception: "Video games are mindless and that they will "numb your brain."

What the Research Says: NOT TRUE

This is largely not true and is quite similar to the misconception surrounding students' grades. Esports can be seen as the equivalent of Chess and Go, two of our oldest and most prestigious sports in modern society.

As shown in Figure 6, cognitive function is the fundamental primary requirement for both chess and esports. Because chess is a board game in which the cognitive decisions are taken in a turn-based manner, both parties have time to breathe and think. By contrast, Rocket League, a popular esports game in which the gamer plays soccer with a car, is constantly in motion, and makes split-second decisions that could lead to a goal for either the participant or their opponent. Ultimately, both situations require a large quantity of cognitive ability, disproving the myth that video games rot brains or that they consist of mindlessly clicking behind a screen. Every click in a video game has a purpose.
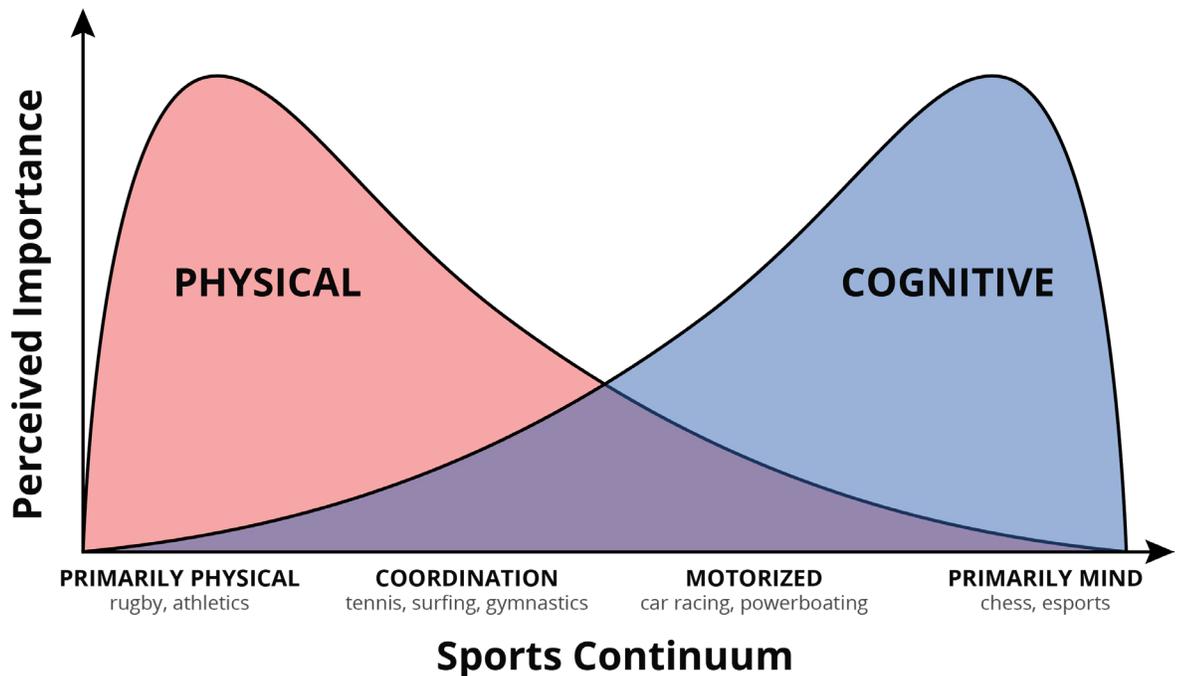

Figure 6. Perceived Importance of physical and cognitive skills across the sports continuum (Campbell, 2018)

Flow State

The "mindless clicking" that occurs in a gaming session could be a direct positive mental activity, as the one clicking is highly immersed in a "flow state."
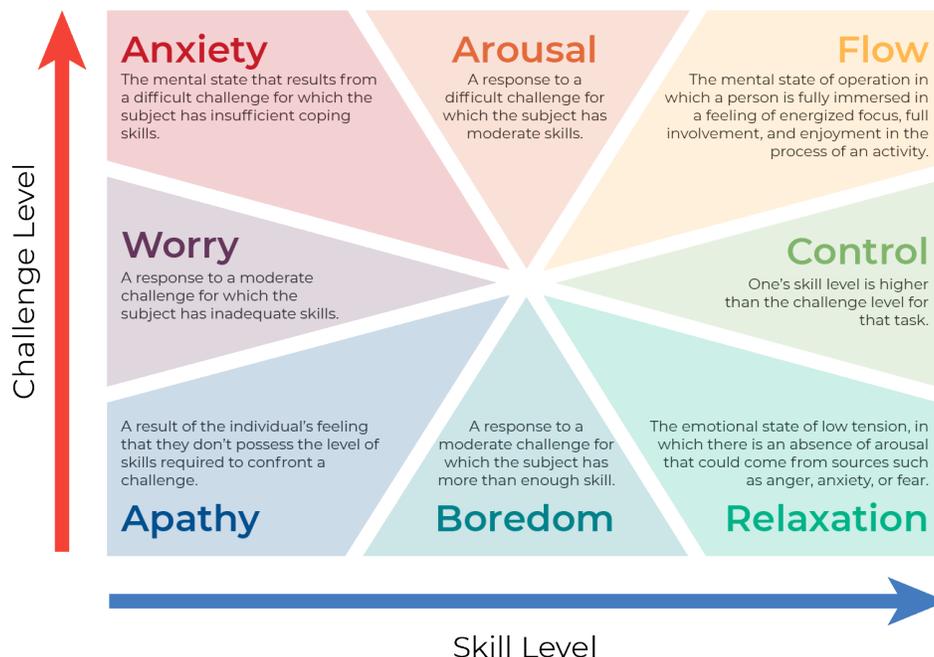
A flow state is defined as a "mental state of operation in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment of the process of the activity,"[8]

During this flow state, video games can be utilized to make learning more effective because the students experience a fully immersive environment, allowing for potentially greater retention of learning material.

What is Game-Based Learning

Game-based learning (GBL) theory takes the concepts of gaming—such as perseverance, consequences, and eventual success—and applies them to learning. GBL teachers have the students work toward a goal and give them the opportunity to make choices as well as face the consequences of those choices. The students are actively searching and exploring the correct ways - and incorrect ways - to reach the end goal, creating an active learning environment instead of the traditional passive learning environment of listening to lectures.

Anxiety
The mental state that results from a difficult challenge for which the subject has insufficient coping skills.

Arousal
A response to a difficult challenge for which the subject has moderate skills.

Flow
The mental state of operation in which a person is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of an activity.

Worry
A response to a moderate challenge for which the subject has inadequate skills.

Control
One's skill level is higher than the challenge level for that task.

A result of the individual's feeling that they don't possess the level of skills required to confront a challenge.
Apathy

A response to a moderate challenge for which the subject has more than enough skill.
Boredom

The emotional state of low tension, in which there is an absence of arousal that could come from sources such as anger, anxiety, or fear.
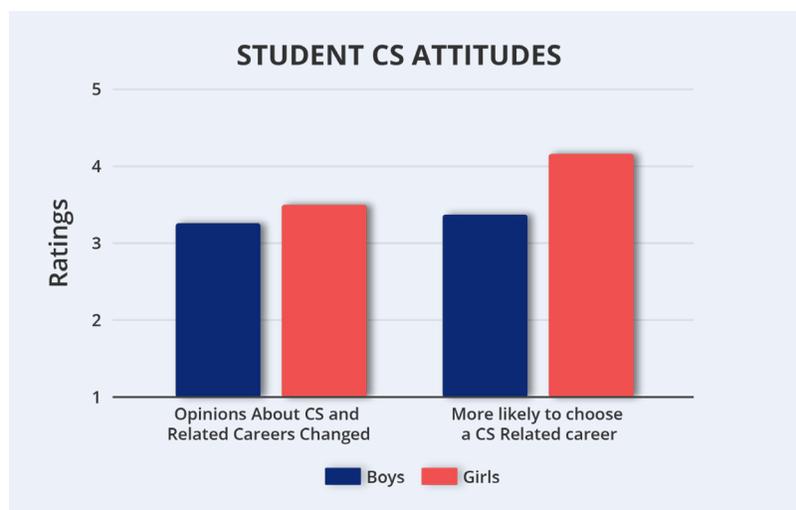**Relaxation**

Challenge Level

Skill Level

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[8]. Csikszentmihalyi Mihaly. "Flow: The Psychology of Optimal Experience," Internet Archive, (1990): 71, link.

GBL teaches students how to think of games not only as entertainment but as a tool for personal growth. "The topic of esports fits well with the students' interests and provides an interest-driven learning environment for students. This interest is connected to the development of academic and professional skills, especially by fostering STEM skills."[9]

GBL can create an environment that can serve to demystify the initial complexity of many STEM fields such as programming.

The authors of a study on what influence games and GBL had on girls' interests in STEM (starting as early as middle school) found that their interests in STEM grew. "Because of the need to introduce STEM subjects and assess interest before students begin high school, the target audience for this project was middle school-aged students. These students would be exposed to programming through playing a computer-based game. They would be provided with an engaging experience with the goal of demystifying computer science."[10] After introducing female students to GBL designed to be inclusive of girls, their interest in computer science increased. The game was intentionally created to contain a female main character and more female supporting characters, none of whom were sexualized or stereotyped, and the tasks were non-gendered—all with the goal of being more inclusive to increase the girls' interest in STEM as early as middle school.

STUDENT CS ATTITUDES

A bar chart titled "Student CS Attitudes" showing Ratings (y-axis from 1 to 5) for two categories. "Opinions About CS and Related Careers Changed": Boys approximately 3.25, Girls approximately 3.5. "More likely to choose a CS Related career": Boys approximately 3.4, Girls approximately 4.15. Legend: Boys (dark blue), Girls (red).

GBL can come in many forms:

In a workshop where students made their own GBL games, it was found that "student voice blog responses indicated interest was boosted by successfully creating a working game of their own, and as a result, students were inspired to do well in future science classes and had new interests in pursuing STEM-related careers."[12] The creation of educational games allows students to understand many aspects of STEM better such as trial and error, cooperation, and experimentation.

10. Desmond Bonner. "A Game-Based Learning Approach to Increase Female Participation in Science, Technology, Engineering, and Mathematics Fields," Iowa State University, 2015, LINK
11. Leonard Annetta et al., "Investigating Science Interest in a Game-Based Learning Project," Journal of Computers in Mathematics and Science Teaching 33, no. 4 (2014): 381–407. Waynesville, NC USA: Association for the Advancement of Computing in Education, LINK.

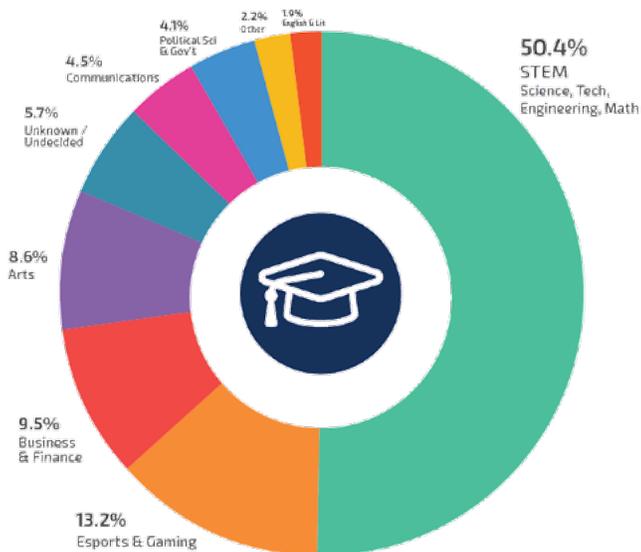## GBL teaches students similar problem-solving skills to those that are applicable in STEM careers.

"Nigel Nisbet, a former teacher and MIND Research Institute's Vice President of Content Creation, said, 'I think one of the things that's important to realize is that, for people facing challenges in STEM careers, those challenges don't switch off, it's not like a textbook you can close and then go home,… games provide that immersive opportunity for problem-solving that you just can't replicate anywhere else.'"[12] The immersive opportunity he describes can be analogous to a flow state—something pivotal to gaming.

Esports and College: Scholarships, Teams, and Clubs

Gaming is no longer just a hobby in college. It has become a path to higher education. "With opportunities to earn scholarships and occupy varsity slots on collegiate esports teams, students belonging to university clubs or varsity teams have started to take playing video games in college seriously."[13] Gaming teaches students indispensable life skills. "As esports become more recognized throughout the world, colleges and universities are seeing the potential of an untapped group of potential students who excel at teamwork, critical thinking, and technical skills."[14]

Study Preferences of Aspiring Esports Players Seeking Collegiate Esports Scholarships

- 50.4% STEM Science, Tech, Engineering, Math
- 13.2% Esports & Gaming
- 9.5% Business & Finance
- 8.6% Arts
- 5.7% Unknown / Undecided
- 4.5% Communications
- 4.1% Political Sci & Gov't
- 2.2% Other
- 1.0% English & Lit

"As of 2021, approximately 200 universities have offered some kind of varsity esports program and have spent nearly $15 million related scholarship programs for top-tier video gamers."[15]

Academic esports are powerful tools that can open eyes and doors for students and lead to scholastic opportunities. This is reinforced by the actions of Riot Games, the publisher and current developer behind one of the largest esports in the world: League of Legends. "The connections between traditional athletic conferences and collegiate esports have become an important avenue for gaming

12. Nyle Sky Kauweloa and Jenifer Sunrise Winter, "Taking College Esports Seriously," Loading: The Journal of the Canadian Game Studies Association 12, no. 20 (2019): 35–50, LINK.
13. Nyle Sky Kauweloa and Jenifer Sunrise Winter, "Taking College Esports Seriously," Loading: The Journal of the Canadian Game Studies Association 12, no. 20 (2019): 36, LINK.
14. Gregory Rothwell and Michael Shaffer. "Esports in K–12 and Post-Secondary Schools," Education Sciences 9, no. 2 (2019): 105: LINK.
15. John Pierce. "Collegiate Esports: Much More Than a Game," Global Sport Matters, April 8, 2021: LINK.

developer Riot Games, for instance, to build relationships with universities as part of their mission to establish esports as a college varsity sport."[16] Academic esports not only help those who learn through these games but also present opportunities for gaming companies and developers.

Gamer-to-Maker and Metagaming

Gaming is not solely a form of entertainment; it can be a creative hobby. One way is through Metagaming, or user-generated content. Metagaming is a bridge between a more casual gaming experience and a more creative side of gaming. This bridge can lead to becoming a maker. "Youth often engage in the creation and adaptation of multimodal literacy practices through video games; this is known as metagaming. Through metagaming, adolescents create para-texts (texts and resources that are related to a publisher-created text) and engage in complex literacy practices."[17] Through metagaming, gamers can become more interactive with their gaming experiences, leading to more creativity and a greater desire to be a maker.

Gamers are developing skills that not only allow them to research and break down the systems surrounding in-game structure but also to understand the ways in which these systems are constructed. This cycle of theory crafting, researching, disproving or proving your hypothesis, and answering the "why?" question is a highly coveted skill in the modern workforce environment and academic environments. Ultimately, metagamers are fantastic problem solvers, allowing them to rise to the top among their peers and have an easier time finding workforce opportunities.

CASE STUDY: MASTERY CODING'S PATHWAY ESPORTS CURRICULUM
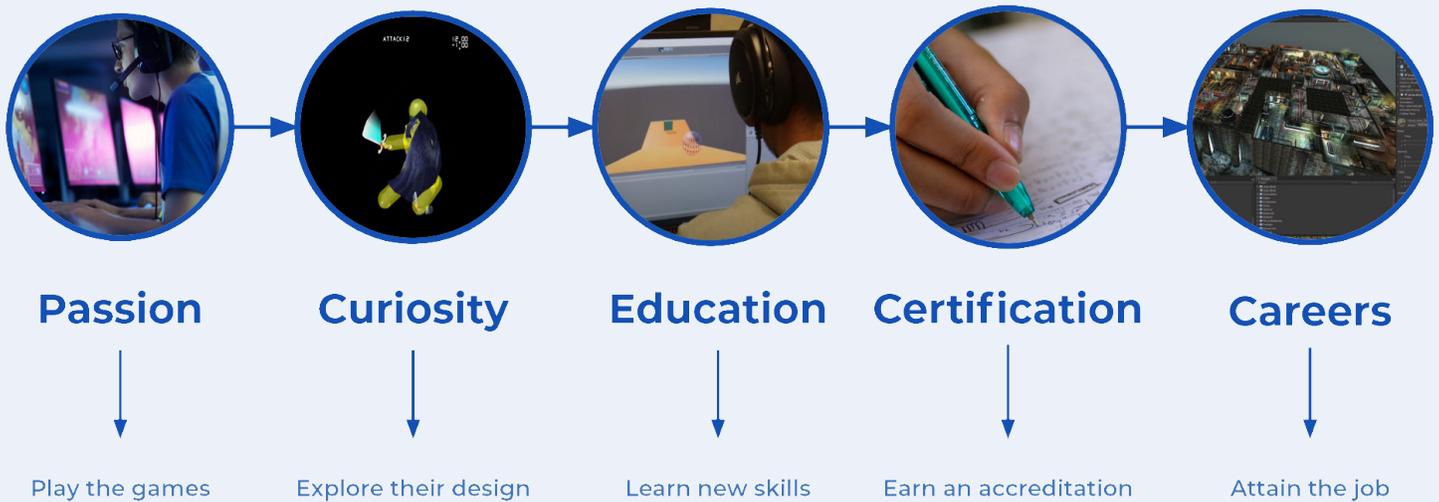
One company has created an academic esports curriculum that is winning the hearts and minds of students across the country. A close look at Pathway Esports reveals the gamer-to-maker pedagogical strategy being used.

Pathway Esports provides students with the tools and skills to create their own games and turn their creativity into a reality. The chief tool that is taught

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16. Nyle Sky Kauweloa and Jenifer Sunrise Winter, "Taking College Esports Seriously," Loading: The Journal of the Canadian Game Studies Association 12, no. 20 (2019): 36,
17. Dodie Niemeyer and Hannah Gerber, "Maker Culture and Minecraft: Implications for the Future of Learning, Educational Media International 52, no. 3, (2015): 216–226, LINK.

for game development is Unity, a real-time 3D development platform that allows developers to take 3D models, audio, images, and other assets and combine them with C# code to create their own behaviors, interactions, and gameplay mechanics. Unity can be used to make any number of creations, such as cinematics, mobile games, virtual reality games, and other video games. Teaching students Unity gives them the means to turn their passion and curiosity for GBL into a finished product that serves to further inspire them. Moreover, Unity is one of the chief programs used in the workforce, reinforcing its importance in the curriculum.

Passion	**Curiosity**	**Education**	**Certification**	**Careers**
Play the games	Explore their design	Learn new skills	Earn an accreditation	Attain the job

GBL's LONG TERM BENEFITS:

GBL fosters social interaction between students and teachers, making it easier to work with others. "The social aspects of team play in esports emphasize social and emotional learning among students. The creation, publication, and implementation of the esports curriculum fill a gap between students' interests and the school and community."[18] GBL is based on reaching goals and attaining problem-solving skills to create a more complete person in society. Although some may view games as an antisocial activity, GBL and esports are inherently social activities that demand cooperation and communication. GBL is a teacher of socio-emotional learning.

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18. Lee, Je Seok, Minerva Wu, Diana Lee, Lee Fleming, Lindsay Ruben, Tom Turner, Kevin Brown, and Constance Steinkuehler. "Designing an Interest-Based Integrated Curriculum Around eSports." International Journal of Designs for Learning 11, no. 3 (2020): 80.

Esports and Social and Emotional Learning

Games can teach players to search for understanding in daily life:

> "In this sense, having a deep understanding of games is more than being able to analyze games in a meaningful way, know how, and why, games help create certain experiences and evoke certain emotions and feelings in its players . . . Understanding games is about having the ability to establish connections between games and between games and anything else."[19]

This kind of attempt to understand the world around you and the people around you is important to socio-emotional learning. Games give an avenue for storytelling and narratives that can positively affect the players by teaching them valuable lessons such as empathy, humility, and the pitfalls of violence. More specifically, e-sport competition teaches the competitors to deal with their own egos and emotions in a healthy manner.

Community in Esports

Using esports as more than just a competitive environment allows players to learn how to work in a team environment similar to other team sports. "Social contexts facilitate learning, often by allowing players to participate in communities of practice . . . that involve the beneficial effects of collaboration. Games are social spaces when their designs and expectations allow players to feel that they are part of a community and can participate in actions and decisions."[20] Gamers have had a community since the earliest days of the internet through gaming forums. In esports, tournaments and conventions are epicenters for community. And more recently, the livestreaming platform Twitch has allowed gaming communities to survive the global pandemic. Community is intrinsic to gaming: "by nature these games are powerful, and are just as viable as other forms of social spheres of interaction. That the community surrounding a game doesn't simply appear, but is one that is nurtured and grown through those directly influencing it."[21] Games are a platform for students to learn to create their own communities with people who share a common interest.

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19. José Pablo Zagal, Ludoliteracy: Defining, Understanding, and Supporting Games Education, ETC Press, 2010, LINK.
20. The American Journal of Play, "The Rise of Massive Multiplayer, Online Games, Esports, and Game Live Streaming. An Interview with T.L. Taylor," American Journal of Play 12, no. 2 (2020): 107–116, LINK.
21. American Journal of Play. Interview with T. L. Taylor, 112.

Conclusion

E-sport is a growing industry, and with this growth, the pathways and opportunities only become more apparent. Through GBL, esports can lead to success in many different fields. GBL's effects on a student can lead to growth emotionally and intellectually, ultimately laying a foundation not only for success but also for happiness. We at Mastery Coding recognize the growing necessity to implement video games and esports into schools, and we hope our persuasion and evidence will lead our readers to a similar conclusion. Academic esports are currently, and will continue to be, key ingredients for youths' success.

Mastery Coding at the Forefront of Academic Esports

No other curriculum offers an integrity of academic efficacy like Mastery Coding's Pathway Esports. Authored by subject matter experts, their pedagogical schema is to channel students' passion for gaming into college and career opportunities, and they do this through a multimodal approach to instruction that includes standards-based, cross-disciplinary lesson plans; a deep commitment to professional development (for coaches, educators, and district leaders); curriculum maps that provide scope-and-sequence pacing plans; and STEM instruction that can open the door to careers in gaming, computer science, and other workforce opportunities in emerging technologies.

THE EDTECH AWARDS
TRENDSETTER WINNER 2021

THE EDTECH AWARDS
COOL TOOL FINALIST 2021

Gaming as a Gateway to College and Career Opportunities

Mastery Coding's Academic Esports uses gaming as a gateway to coding, graphic design, software development, business management, marketing, organizational leadership, and much more. Some of the benefits for students include the following:

- **participation in a noncontact sport that generates college scholarship opportunities and career-pathway internships that can lead to dynamic jobs**
- **robust student engagement that is harnessed to introduce workforce opportunities in entrepreneurship, broadcasting, marketing, social media, and more**
- **the development of social and emotional learning. Mastery Coding's program is aligned to the 5 Core Competencies of Social and Emotional Learning with curriculum connections woven into the program at every turn.**
- **equity and inclusion: Mastery Coding gives students who would not normally participate in more traditional team sports the opportunity to be part of the academic community through a unique lens.**

> *"Esports helped me develop and learn skills that have helped me in my college courses and career. I have learned many life lessons from playing on an organized team that will stick with me."*
>
> *—Colin "McGregor" Grier | E-sport Captain | Champlain College*

Mastery Coding's Pathway Esports™ Toolkit

With Mastery Coding's Pathway Esports™ toolkit, students and schools have everything they need to start and run their very own esports team and compete in local and national tournaments.

Pathway ESports™ Overview: A General Gist of What to Expect

Building a Team

- **Major Titles - choosing the right game**
- **Team Setup - recruitment and hardware**
- **Team Roles - players and coaches**

Practice Makes Perfect

- **Day to Day - how to train**
- **Gaming Athletes - mind, body, heart**
- **Flow State - getting in the zone**

Competitive Gaming

- **Industry Trends - what you need to know**
- **Esports History - how we got where we are**
- **Careers - parts of the industry**

Competition

- **Entering Competitions - tournament sign-up etiquette**
- **Career Opportunities - college and careers**
- **Hosting a Tournament - running a tournament**

How it Works

Mastery Coding's Academic Esports program runs like any other sport on campus. And no prior experience is needed - for either coaches or players.

Mastery Coding's Academic Esports After-School Clubs

Mastery Coding's Academic Esports After School Clubs have seen tremendous success among students who partake of its engaging activities. These virtual programs help learners stay engaged with their peers digitally and educates them on STEM career opportunities, digital citizenship, and online safety.

Mastery Coding's Academic Esports After School Clubs promote digital competency and teach students valuable online skills about how to manage conflicts and treat each other well. These programs add an additional opportunity to find the joy and engagement that come with traditional after-school activities like book clubs, sports, and chess.

Online Safety Is a Top Priority

To ensure children's safety, these clubs will take place on Mastery Coding's COPPA-compliant, Safe Harbor-certified platform and include coaches who are federally background-checked and have SafeSport certification and training.

Mastery Coding is developing a network of digitally literate students that treat each other with respect and dignity in a nontoxic environment.

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