Toward a Design and Play-Focused Approach to Teaching Technical Game Design

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ABSTRACT

As of 2023, education surrounding game design has become a fixture in university education systems around the world. As the teaching of game design is an inherently interdisciplinary subject with many connections to the arts and humanities, there are a diverse range of perspectives as to what the focus of each curriculum should include. In this essay, we argue that game programs with a more technical focus should include both design and play-focused approaches embedded into the pedagogy. We present two case studies drawing from our education journeys studying games as well as our experiences teaching in both game and computer science programs, and discuss the resulting benefits of integrating these concepts into our practice.

KEYWORDS

education, pedagogy, game design, computer science, play-centric, larp, design

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1 INTRODUCTION

As of 2023, game curricula have become broadly established within university-level education. As the study of games is a very interdisciplinary subject, educations may cover a broad range of topics from the humanities and design to more technical computer science topics such as game AI or game engines. Thus, discussions surrounding if and how to craft a game curriculum that can encompass all of these elements is highly relevant to both administrators and educators. Some make claim to having a broadly scoped game curriculum, covering many topics within games— for example the interactive media program at the University of Southern California (USC) "combines a broad liberal arts education with the technical expertise needed to create games" - Tracy Fullerton [16]. However, this isn't the only perspective as to how to build out a game curriculum. In the early 2000s, game curricula were sparsely found at universities, and were created as offshoots of other, more established disciplines within the universities. Despite the growth of games as its own discipline, this is still true today—many game-focused educations are specializations within the university's computer science department such as at the Game Development specialization of the Computer Science program at the University of Saskatchewan [1], Computer Science: Game Design at University of California, Santa Cruz [2], or Computer Science (Games), at the University of Southern California (USC) [3]. In these curricula, the majority of the courses rely heavily on computer science topics such as databases or multi-threaded programming, potentially taking away space from other more design, play, or liberal arts focused courses. These kinds of arts courses are often overlooked in a computer science-focused curriculum, or seen simply as "electives" (i.e., non-integral to the "technical" curriculum design). Usually the curricula that are more balanced toward many aspects of games are not part of the technical departments at all, but stemming out of an art or humanities-focused department. For example, as mentioned earlier the USC Game Development and Interactive Design curriculum [4] blends many aspects of the game industry into one (i.e., art, design, computer science, and business) as well as the Video Game Design and Development degree at the Universidad de Diseño y Tecnología [5].

Not only is this a problem stemming from how game curricula were initially attached to other domains when first created, but also of values still prevalent today amongst many administrators. Anecdotally, it seems that educators still see that specializing in a more established sub-discipline of games (e.g., computer science *or* art *or* business rather than a focus on *all* these elements) will lead to diminished future employability. These values seem partially based on an old fear that the game industry was unstable and not here to stay, and majoring in a more established subject would increase future employability outside of the games industry should one fail to be hired within it. However, with the games industry now valued at over US$249.60bn worldwide as of 2023 [6]; it is clear that education surrounding games is profitable, and those studying it will be highly employable. Not only is an education that focuses on the broad range of game topics a well-regarded research discipline of its own, but also an asset to the industry; helping to train individuals to enter the game industry post-graduation. Game industry professionals value education surrounding game-focused educations—there are

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[1] https://admissions.usask.ca/computer-science.php#Programoptions
[2] https://admissions.ucsc.edu/programs/computer-science-computer-game-design
[3] https://catalogue.usc.edu/preview_program.php?catoid=12&poid=13000
[4] https://catalogue.usc.edu/preview_program.php?catoid=18&poid=26149&returnto=7464
[5] https://udit.es/en/studies/official-degree/video-game-design-and-development-degree/
[6] https://www.statista.com/outlook/dmo/digital-media/video-games/worldwide

now many company-led game industry training programs and trade schools that teach specific tools and skills needed for jobs or demands from the game industry [7]. For example, Ubisoft now offers a graduate program in games [8], which trains students specifically on Ubisoft's own tools and needs. University game educations focusing on a broad range of game-related topics (e.g., design, UX, business, production, audio design, interactive storytelling) and tools used within them (e.g., Unity 3D [9], Autodesk Maya [10], Twine [11]) will help to better support and train future game industry professionals.

In this paper, we argue for the approach to technical game education that trains students on many various aspects of games rather than simply as a specialization within the computer science degree. We specifically advocate for incorporating aspects of design and play throughout the more technical computer-science focused game design courses, or establishing a few of these courses (i.e., particularly design and play-focused courses) as fixtures within the more technical computer science curricula. As two junior researchers (one postdoc, one assistant professor) that have studied and taught within technical computer science/game programs at various universities for 8+ years, we present two case studies as accounts of courses we have taught (*Educational live-action roleplay* and *AI in society*). In the first case we share general curriculum elements, and in the second we focus on describing a particular task within an assignment, both advocating for the adoption of these and similar design and play-focused elements into technical game educations. We also share resources for how other educators can adopt elements of these courses into their own, as well as reflections from our experiences teaching these courses in 2022 and 2023.

2 BACKGROUND

In this section, we present perspectives toward the interdisciplinary struggle of where to focus game education curricula.

The first computer games education dates back to 1998 at Abertay University in Scotland [23] and since then many have risen up worldwide, stemming from departments of computer science to art, design, production, user experience, and humanities [12]. A majority of these games curricula exist within technical and computer science based educations. Tunnel and Norbisrath [36] analyzed 113 bachelor game programs in Europe, highlighting the overspecialization of technical game and game art curricula. Their work emphasizes that technical game programs rely heavily on game development and programming courses, and lack design or art oriented courses; yet these prove necessary for jobs within the game industry [28].

Another perspective focuses on the fact that we should educate for the ever-growing technology field and therefore support a more generalized computer science education. Kenwright [20] discusses the need for game design curricula to not hyper-focus in games specifically, yet rather emphasize more general computer science topics. As before with the work from Tunnel and Norbisrath, what Kenwright describes is a phenomenon that is present in many technical games curricula. For instance, Meeks [30] discusses how game development curricula put great emphasis on the programming aspects of game design, overshadowing design and humanities aspects. Bayliss and Bierre [1] explores if, given the specialization and focus on games, students receive as rigorous of a computing education. They argue that game curricula is as rigorous of an education, but also place a greater emphasis on creativity in the programming tasks. Moreover, these studies highlight the importance of **interdisciplinary curricula** [9, 16, 30] as a fundamental aspect of game education. Czauderna [9] advocates and outlines a model of game design education that emphasizes games' broader implications within aesthetic, historical and cultural contexts, rather than the technological development of games. Fullerton [16] discusses the overemphasis on technical aspects of game design and advocates for a play-centric approach to education that elicit critical thinking and creative expression. She states, "Such programs effectively prepare students for entry-level positions in the game industry, such as a 3D animator, but, by depriving them of a broad liberal arts education, do not encourage the kind of critical thinking necessary to transcend existing boundaries of content and expression.". This play-centric focus emphasizes design thinking [10], which would help in supporting and building students' capacity for communication, collaboration, critical thinking, and creativity [35]. Interdisciplinary technical games education would not only attract more diverse prospective students, it would also better prepare them for the game industry, and even enable education for those that might just want to explore the boundaries of games and play as described by Jenström [19].

In a more general sense, curricula, the classroom, and ultimately higher education institutes need to adapt towards the developing society and the prospective students and their diverse backgrounds. Technical games education and games education in general, attract students with diverse backgrounds and ideas, and they should emphasize and adapt to these, yet it is common that institutes shapes students to specific goals rather than the other way around [7]. However, there are clear limitations and challenges on developing game curricula with a strong focus on the resources, and structural and organization restrictions that exist in higher education [27, 29]. For example, anecdotally, within our institutions the problems are multifold: there are not enough staff within the CS or games departments that have both the expertise and hours to teach these kinds of topics, syllabi are set well in advance or not able to be adapted to include these elements, or there are already tight teaching schedules not allowing for additional content. Taking these challenges in consideration, in this paper we take a similar play-centric and design focused perspective to Fullerton [16]. We acknowledge the organizational challenges that designing such a curriculum presents, and advocate for broadening technical game education toward a more interdisciplinary curricula both as courses of their own or by incorporating play and design approaches into existing courses to underscore design thinking.

[7] https://thegameassembly.com/, https://futuregames.se/
[8] https://www.ubisoft.com/en-us/company/careers/interns-graduates/ubisoft-graduate-program
[9] https://unity.com/
[10] https://www.autodesk.com/products/maya/overview?term=1-YEAR&tab=subscription
[11] https://twinery.org/
[12] https://www.princetonreview.com/college-rankings/game-design/top-25-game-design-grad

3 CASE 1: EDU-LARP AS PLAY-FOCUSED EDUCATION

Here we detail a case study describing the curriculum and reflections from the teaching of a course, *Educational live-action roleplay* (edu-larp) to third and fourth year undergraduate students. This course curriculum was first created and taught by the first author of this paper at University of California, Santa Cruz in the Spring of 2023. This account highlights the benefits of incorporating more *play-focused* courses alongside and integrated within the more technical game design curricula. In this section, we describe and advocate for this course and more courses like it to be included into technical game education.

Live-action roleplay, or larp, has been a popular leisure activity for many years, but has been expanded out for use in research and teaching contexts as well (e.g., as an embodied design method in human-computer interaction domain [26]). In an educational context, it is referred to as edu-larp, or educational live-action roleplay [4]. In education today, edu-larps exist for all types of school subjects from natural sciences to geography [13]. In Denmark, there is even an entire school, called Østerskov Efterskole [14] that incorporates edu-larp into the curriculum directly as the primary mode of engagement with the material [8, 31]. Edu-larp is cited as an active and experiential learning approach [22] that promotes empathy-building and perspective taking, identity exploration, hones problem solving skills, and enhances creativity and cooperation amongst students [25]. Many different levels of education incorporate larp or larp-like elements into their curricula, for example in middle school classrooms [4]. In terms of university-level education, however, few established game design curricula incorporate elements of larp. A few notable ones that do include the Transformative Play Initiative [15], part of Uppsala University in Sweden, as well as the former Transformative Play Lab led by Theresa Jean Tanenbaum at UC Irvine [16]. Research at this lab includes many aspects adjacent to larp, including "questions of identity, justice, playfulness, design, and futurity" [17]. Incorporating transformative play or similar approaches into technical curricula has myriad benefits for students: encouraging empathy building, identity exploration, perspective-taking, and playfulness.

3.1 Curriculum Design & Resources

The course design was inspired by the NSF-funded project "The Anywear Academy", which was designed as a 5-day summer camp for youth [18] as a way to teach STEAM skills through the design and creation of social wearables. In this camp, educational live action roleplay provided a frame and narrative context for the learning [13, 14].

The syllabus of the course states:

"*This in-person course will focus on introducing students to edu-larp (educational live-action roleplay). Students will attend lectures, which are designed to be interactive, mixing videos/presentations about larp and edu-larp with activities and discussion. Assignments will focus on different aspects of larp (including its application within education, design, and other such contexts) through the enactment of larp scenarios, and reflection on these scenarios. The final project will consist of the students designing and enacting an edu-larp within the context and domain of their choosing, utilizing all the learnings from the course*".

This curriculum was designed as a 10-week course, and run at UC Santa Cruz in the Spring of 2023. As the primary goal was experiential in having the students participate in and design as many mini-larps as possible throughout the 10 weeks, each week would build off the previous week and cover different sub-domains relating to edu-larp. The course was project-based with weekly assignments to either complete critical reflections based on in-class larps or readings. While the course was focusing on edu-larp in particular, each assignment (and week) was covering a different topic drawing from research in a broad range of domains surrounding edu-larp: education and roleplay [5, 17], larp and edu-larp [13, 26, 34, 37], social and emotional design [18], and others. The readings for the course drew from the vast number of resources available on the Nordic larp wiki [19] and the Knutepunkt books [20], which are compendiums of talks and insights from the Knutepunkt conference series taking place in Scandinavia each year. In addition, numerous larps designed by others were run, such as one designed by Carly Kocurek called 'Are you like OK?' [21] and 'Omgiven av Känslor' (translated from Swedish to 'Surrounded by Emotions') originally designed in 2019 by Swedish larp designers Karin Johansson and Jon Back. Each week was dedicated to building skills, all helping students progress toward a final project, which was a group assignment to design and play through an edu-larp (30 minutes, with around 10 participants). The first 5 weeks were dedicated to participating in a number of larps and learning different sub-topics relating to larp, and the second 5 weeks focused on designing larps. The focus on 'edu'-larps rather than just on larp was meant as a way to help students understand the applicability of using larp for purposes other than leisure—for example as a tool within their own game design and education journeys. While this course was implemented originally within a 10-week time-frame, pieces have been extracted and compressed to be used as parts of other courses. Ideally, pieces of this course could be adapted for use within a technical computer science course. For example, in an Intro to Game Design or a Game Programming course, there may be one assignment dedicated to exploring embodied design methods, and all the games or tasks must be constrained to designing with and for the body, such as the use of embodied controls as an alternative controller or using bodystorming as a method to design the game interactions. Further resources including the syllabus, readings, in-person exercises, larp documents, and other course-specific resources can be found at https://github.com/aeau/play-pedagogy.

[13] https://lajvverkstaden.se/malgrupp/skola/
[14] https://osterskov.dk/
[15] https://www.speldesign.uu.se/research/games-and-society-lab/transformative-play/Transformative-Play-Initiative/
[16] shut down in 2023 https://transformativeplay.ics.uci.edu/
[17] https://transformativeplay.ics.uci.edu/research/
[18] https://sites.google.com/UCSC.edu/anywear-academy
[19] https://nordiclarp.org/wiki/Main_Page
[20] https://nordiclarp.org/wiki/Knutepunkt-books
[21] https://alexandria.dk/en/data?scenarie=17899

3.2 Reflections and Implications for Technical Game Design Curricula

This section highlights anecdotal reflections from the running of this course in the spring of 2023, in terms of both the benefits and challenges of teaching edu-larp. This perspective is educator-focused, but partially informed by discussions with the students of the course, from midterm and final course evaluations.

Added a range of embodied design methods to students' designer toolbox. This course was composed of students both from the Computer Science: Game Design major and Art & Design: Games & Playable Media (AGPM), thus students had a range of technical backgrounds and expertise. In general, students indicated little to no familiarity with larp or larp-adjacent methods prior to the course beginning. One notable exception is a student that mentioned they used embodied sketching as a way to try out certain mechanics of a weapon they were making in a game designed for another class. By the end of the course, everyone had used bodystorming [32] and other embodied ideation methods [33] as techniques to design physical play experiences. The diverse set of methods taught within the course adds designerly techniques for use by the students as future game designers.

Students became highly skilled at roleplay. One particular assignment was for students to facilitate a short one-page RPG of their choice (in their final project groups) for the rest of the class. This was setup for the first 20-30 minutes of each class, allowing for students to warm up roleplaying as well as break up the lecture. Each week, the students had to exercise skills they often never do: improvisation and performance. Students got more and more comfortable throughout the course, until at the end it was seamless—the group became seasoned roleplayers.

Diversified their design thinking skills in service of designing social games. In general, students in the course were studying a curriculum that was largely setup around digital games. The design of larps is quite unique, having students think outside of the constraints they are used to, toward more *social* and *physical* elements of game design. In the design exercises, it was challenging to help students out of their previous mentalities about what larp is and should be. Many students wanted to design their larps with a win condition, or including typical tabletop elements such as dice rolling. Many struggled to think of larp as both social *and* embodied, instead creating games that highlighted one or the other such as classic hidden role roleplay games like variations of Werewolf [22]. However, we see this as a necessary step in the process of allowing students to break these pre-constructed notions in order to think outside the box. One challenge was that while few students had experience playing other non-digital roleplay such as dungeons and dragons or murder mystery games, many did not. In the future having a two-part course would be of benefit in teaching edu-larp; one part orienting students to common types of tabletop or general roleplay experiences, and then adding a design exercise focused on changing something to break the genre convention. The second part of the course would then focus on larp and edu-larp, after students are more comfortable and accustomed to the genre.

[22] https://en.wikipedia.org/wiki/Mafia_(party_game)

Engaging in social play frequently helped willingness to engage with the material. Throughout the course and from feedback received from students after the course ended, it was clear how important it was for students to engage and socialize with one another, and given the space to do so within the curriculum itself (i.e., with peers they might otherwise not interact with). This course combined students from two different departments, and without a course like this they would not otherwise meet. These assignments allowed them time to play together, connecting them through these shared experiences. After COVID, giving people a space to be together, socialize, and play is of the utmost importance for health and well-being. Allowing the space for this *within* the university curriculum allows for strong bonds to form between students. In turn, this also helped with their comfort in one another (functioning in a way as an alternative to social ice-breakers [11]), allowing them to more freely and willingly engage in the class activities.

4 CASE 2: SPECULATIVE DESIGN AS AN EXPLORATIVE TOOL

Here we detail a case study describing the implementation of a course project and assignment as an explorative tool, and reflections from the teaching of a course, *Artificial Intelligence in Society*. The course is an optional course for students with any background and without any pre-requisites, but is mainly taken by students within computer science departments that want to learn more about AI and its implications. This course project was first implemented and analyzed by the second author of this paper at Malmö University in the Fall of 2022 and 2023. This account highlights the benefits of incorporating more *design-focused* assignments and projects within computer science programs with the aim of highlighting the importance of future and design thinking and its possibilities for technical game design curricula. In this section, we describe the implemented task, reflections from going through two iterations of teaching the course, and expectations over the implementation of similar tasks within technical game design curricula. The project and assignment description along with other course-specific resources can be found at https://github.com/aeau/play-pedagogy.

Speculative Design focuses on critically imagining future scenarios and possibilities with the goal of exploring "what if?" questions [12]. This speculative and design fiction approach has many benefits, such as foresight of possible situations, helping address uncertainty, establishing steps towards a better future (or steps away a worse future), and most importantly, critical thinking over design and its implications. Previously, speculative design has been applied to a broad range of design tasks. For instance, Brown et al. [6] explored the future of IKEA catalogues with IKEA, and in that way it opens up for thinking and talking about present day concepts and constraints. The task reflected in this section is based on Fiesler's work on ethical speculation [15], where she discusses her approach to creative speculation for ethical and legal courses to address uncertainty and consequences with emerging technologies through the use of black mirror as a teaching exercise. Klassen and Fiesler [21] analyzed this further and interviewed instructors using black mirror in a similar way, highlighting benefits such as student engagement, framing for thinking about technology in

connection with ethics, and critical thinking over possible consequences. Within games and games education, speculative design and design fiction could help students not only understand better the expectations and needs of players and users, but also helping them have a pro-active design thinking approach to game design.

4.1 Speculative Design Task

The *AI in Society* course is mainly taken by students of different computer science specializations such as system development, IT and economy, and Information Architecture; yet there is no technical background or background knowledge needed to take the course. The main idea behind this speculative design project is to put into practice core concepts and topics learned and discussed throughout the course such as Large Language Models or Human-AI Collaboration.

Students were tasked, in groups, to use design fiction and imagine alternative futures where AI blends in society in some area of their interest. Their work is to think about the impact in society, the goals of the AI system, and explore the boundaries of these systems and future society and consider the trade-offs and limitations. Particularly, we discuss how the technology would affect society in the short- (6 to 24 months), mid- (5 to 10 years), and long-term (20 to 50 years). The assessment has little to no focus on grades, with the emphasis primarily on the discussion and design thinking that comes from the speculations, the design process, and discussing with others.

4.2 Reflections and Implications for Technical Game Design Curricula

Throughout these last two years, 14 different projects were submitted. In 2023, half of the students focused their topics on health-related activities such as collaborative systems in healthcare and elderly care. The other half focused on the education systems for students in different age groups such as in pre-school, high-school, and university level. In 2022, there was more diversity in the project domains, from AI systems applied to assist security guards at nightclubs to human-AI collaborative systems to help judges.

Student engagement and learning contextualization: When presented with this task, most of the students were unaware of what speculative design was. For some, the task was an "easy A" as there was nothing to develop and they could just (creatively) think about any topic. For others, this task presented a challenge given that it was an open assignment without a specific set of directions on what was needed to be done. However, at the end of the course most students felt that the project allowed them to explore their areas of interest and how these systems might reshape or reformulate those spaces. Contextualizing learning is a challenging task given the need to adhere to pre-set learning outcomes, yet doing so is necessary for students' deep learning [3], which can be addressed with these types of approaches.

Open environment to challenge today's assumptions: As technology develops, it becomes rapidly integrated in different areas of society. Many times, we see these technologies as positive and beneficial without thinking about their challenges or limitations. Similar to what Brown et al. [6] highlight in their IKEA catalogue work, imagining these possible futures enables a way for us to see the current situation of the present day through a more critical lens. For instance, students working on a system to assist security guards at nightclubs questioned the limitations and challenges of security guards, and why these challenges exist in the present day in first place. The task helped the students to critically reflect over today's systems and how they could change over time to fit the needs of the future society, as imagined today.

Observe situations from others' perspectives: In the end, the goal is to understand not only how something might affect ourselves, but how it would impact others. This is particularly true when we speak about AI, since the benefits and consequences of AI are completely disproportionate for different areas of society with more negative effects for underrepresented communities with an emphasis on fairness, bias, accountability, and privacy [2, 24]. Speculative design gives the opportunity to understand what steps could be taken to avoid unwanted consequences, and what needs to be discussed in the present day to diminish these. This course project places an emphasis on reflecting about who the target group of the design is and what their attitudes toward these technological changes would be, and who else in society may be impacted by this as well.

While this speculative design project was implemented in an *AI in Society* course, its core idea could be implemented in any course or activity like Fiesler's "black mirrors writer's room" [21]. This reflection highlights the possibilities to better understand current problems, ideas, and concepts by speculating on them. Technical game design students would gain an advantage from all of these benefits as the design of their games, tools, or systems could be further explored through speculation.

The following examples are possible ways we see such a speculative design assignment incorporated into a technical game course.

Example 1 - Speculative design in game design projects: When faced with the task of designing a game, students take different paths to formulate their game ideas. Among the many ways this could take place, they might think about the set of mechanics and dynamics that would make the most engaging game experience to their standards, or they could also think about the narrative and how it is driven. If we could instead set the design problem as a speculative project, students could have a safe environment to explore their ideas and the challenges and trade-offs that come with it; effectively integrating more design thinking to the project preparation.

Example 2 - Speculative design for the development of Ms. PacMan AI: Instead of thinking about a project that could already include some type of design elements in it, we could take a typical technical game design assignment for a games programming course. Developing the AI of Ms. PacMan is a typical task in Game AI courses. The task may vary given the particular technique to use, but AI design seldom happens. One reason for this is that the task itself does not encourage design thinking, but also because usually it is more important that the algorithm or implementation is correct rather than the behavior or the process. We argue that all of these elements are as important, and that applying speculative design to such a task could help achieve all of them and foster problem solving and creative/critical thinking. Particularly, speculative design could help understand the expected behavior and how that would affect possible players and other parts of the game, currently and in the future.

5 CONCLUSION AND NEXT STEPS

This work is based on post- reflection of the education journeys and teaching experiences of two junior academics (a postdoctoral fellow and assistant prof.) within the global north and western education systems. We acknowledge that this gives us a particular bias and perspective toward game education and this is reflected in both our viewpoints and the way in which we structured our courses. In addition, our inspirations for the design of these courses come from largely Western research areas. In the future, we hope to look into and draw inspiration from game curricula beyond the global north to other parts of the world. In summary, we advocate for the broadening of technical game curricula by incorporating courses or elements from a design and play-focused approach. We specifically discuss our account of edu-larp and speculative design as ways of doing this, however there are many topics and practices that could be incorporated (e.g., transformative play, design thinking, critical design, roleplay).

We acknowledge that our reflections and cases are just two approaches that could be used to inspire a more interdisciplinary games education. Our aim with this paper is to call attention to the ever-present need (we think) to establish design-focused courses like this within game design educations. Conversely, we also advocate for a more interdisciplinary education the other way around: more technical courses should be offered within art and design focused game programs as well. For example, the art-focused games program at UC Santa Cruz called Art & Design: Games + Playable Media does not require students to take any technical computer science courses that are not focused on art or animation [23]. Programs like these should encourage students to take computer science courses as well, allowing for a more interdisciplinary games education [36].

In conclusion, neither of us had these type of courses, projects, and assignments throughout our educations. We see this as an inherent weakness with the current technical game curricula, as these design and play-focused assignments emphasize a myriad of important skills as described in our reflections. However, we are aware of organizational, structural, and managerial limitations that could reduce the possibilities in higher education institutions to incorporate these and similar ideas into an interdisciplinary curriculum. Therefore, we also believe that these ideas can be added into existing curricula. Resources we provide at https://github.com/aeau/play-pedagogy can help future educators include elements of our courses into their own.

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