TRAINING DESIGN STUDENTS TO BUILD A BETTER FUTURE

TREINAMENTO DE ESTUDANTES DE DESIGN PARA CONSTRUIR UM FUTURO MELHOR.

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ABSTRACT

So far, during human evolution, we (humans) have been going against nature instead of adapting and evolving with it and in this aspect Covid-19 outbreak has been a humbling experience. Many so-called solutions are designed without considering or evaluating the negative consequences that we are all facing nowadays and that are going to get worse over time if changes are not made. We claim that designers have the responsibility of stepping up human evolution as our role in this Material Realm (Margolin, 2002). For that, we propose the concept of a simulation game (Second Planet) that aims to shape design students' actions towards solutions that will improve human evolution. As a simulation, students would be able to prototype, test and implement their solutions in the Second Planet where the consequences of their solutions could be analyzed from societal, environmental and ethical dimensions without causing harm in the real world. A tool to promote a change in the student's behavior towards the implementation of social responsibility in Design.

KEYWORDS: Design in the anthropocene. Design for sustainable behavior. Design for social innovation. Human evolution. Systemic design.

RESUMO

Até o momento, durante a evolução humana, nós (humanos) temos ido contra a natureza em vez de nos adaptar e evoluir com ela e, neste aspecto, o surto de Covid-19 tem sido uma experiência humi- lhante. Muitas das chamadas soluções são concebidas sem considerar ou avaliar as consequências negativas que todos enfrentamos hoje e que vão piorar com o tempo se não forem feitas alterações. Afirmamos que os designers têm a responsabilidade de intensificar a evolução humana como nosso papel neste reino material (Margolin, 2002). Para isso, propomos o conceito de um jogo de simulação (Second Planet) que visa moldar as ações dos alunos de design em direção a soluções que irão melhorar a evolução humana. Como uma simulação, os alunos seriam capazes de prototipar, testar e implementar suas soluções no Segundo Planeta, onde as consequências de suas soluções poderiam ser analisadas a partir de dimensões sociais, ambientais e éticas sem causar danos no mundo real. Uma ferramenta para promover uma mudança de comportamento do aluno face à implementação da responsabilidade social no Design.

PALAVRAS CHAVE: *Design no antropoceno. Design para um comportamento sustentável. Design para inovação social. Evolução humana. Design sistêmico*

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1. INTRODUCTION

> Imagine a civilization so artfully and carefully designed that it would protect posterity, ecological processes, and the larger fabric of life on Earth, for as long as one can imagine. (ORR, D., 2017, p. 14, c. 1)

Humans have come a long way in making tools and using them to their own benefit. We have come to the point where our tools make new tools which were supposed to benefit us, humans. Yet why would someone consciously ignore to understand the possible consequences of their design? A systematic decision making that has negatively affected us all for at least a couple hundred of years. As part of the human (as a species), designers have not consistently shown how this profession can change the human world for the better but rather, have been playing a big part to worsen the manmade complex problems humans face, also known as the Grand Challenges, "formulations of global problems that can be plausibly addressed through coordinated and collaborative effort" (GEORGE, G *et al.*, 2016).

We argue that all humans are designers to some extent as we, regardless of age or background, do plan and bring to reality projects and solutions. Notwithstanding the facts above described, intelligent design, as classified by Orr, when properly used can "reduce material, water and energy use and therefore, pollution". Important authors have expressed their concerns on the role designers play in society (MARGOLIN, 1998; MARGOLIN, V., 2002; MARGOLIN, 2009; MARGOLIN, V.; MARGOLIN, S., 2002; ORR, D., 2017; PAPANEK, 1972) As ORR, D. (2017) similarly emphasized in his work "The political economy of design in a hotter time" starts with a good example of how design choices can and are used to create and deepen exclusion in society by designing a super life style for super humans who can feel better when treated and seen as unique or superior to other people in some way; a made up, airbrushed "Super-human perfection" shown through "higher profits" that promotes "exclusion". These Superhuman aspects are not to promote better humans but sadly provide a narrow unnatural perspective of a make-believe story on how we should live our lives and achieve (a never achievable) happiness.

In order to better understand it one must understand the Affordances' definition adopted in this article, brought up by DAVIS, J. L. (2020), as in a "multifaceted relational structure", that permeates the whole fabric of technological paraphernalia developed by designers. Such technologies, as he clearly expresses, "do not make people do things but instead, push, pull, enable, and constrain. Affordances are how objects shape action for socially situated objects." (DAVIS, J. L., 2020, p. 6). Another important definition is on the terms "developed" and "developing" countries where here the mentality adopted for these terms meant to be "exploiter" and "over-exploited" countries, as well expressed by Michael Parenti (1986 *apud* (T. JANAKOS, 2011)) "Poor countries are not 'under-developed', they are over-exploited".

There are indeed many ways one could deal with this worldwide endemic problem. With this in mind, the British economist Raworth (2012) from Oxford University developed a visual framework called "Doughnut model" to help societies to prosper harmoniously within this planet. As humans certainly need to learn a new way of living within this planet, this work is focused on Tertiary design students as the future generation who will need to deal with this and other more complex problems. As they will need a tool to faster understand the consequences of their design solutions, this game simulation idea aims to improve their critical level of thinking and therefore, the solutions proposed by them. It may sound unfair to rely on the universities alone to undo what most school systems do to our children by shaping them to not think critically and only prepare them to do what they are told, but someone needs to prepare them to think critically so they can shape humanity's future.

In order to guide the reader, we are going to ask three questions: Could we use a technological tool, in this case a game, to offer students more experience on the consequences of the solutions they propose? How complex would that tool be? What parameters would be used by the game simulation? With this game tool concept, the intention is to offer students more experience in a shorter amount of time, to slow down the production of unnecessary prototypes and to only use real humans to test solutions that are focused to improve humans' lives and therefore, our species' evolution.

2. THEORETICAL FOUNDATION

We, as humans, have built a material world, Realm of the Material World (EEKELS, J, 2000/02), all around us that is not building us up but rather making us weaker and sicker due to our physical, economic, political, and sociocultural contexts that promotes unhealthy

behaviors since childhood (BROWN, C. L. *et al.*, 2015; SENTALIN, P. B. R. et al., 2019). The exploiter countries (PARENTI, 2005) in the world shall lead as an example to other countries and this position also comes with the responsibility of doing what is best in many different aspects but the most important might be what is best for humans. As a design student learning the level of complexity in which countries operate, their social, cultural and economic differences, this level of complexity is not something a student can get his head around easily as much as institutions and professors do their best. This complexity can be tackled by Systemic Design approach that, as brought by Barbero and Toso (2017 *apud* Ceschin, F, 2019),

> [...] the Systemic Design approach seeks to create not just industrial products, but complex industrial systems. It aims to implement sustainable productive systems in which material and energy flows are designed so that waste from one productive process becomes input to other processes, preventing waste from being released into the environment (CESCHIN; GAZIULUSOY, 2019/10, p. 113, c. 10).

As a way of speeding up some of the experience a student may encounter in real life, that is what the simulation is for. It can offer the same level of complexity and is able to forward in time showing the consequences (including behavioural) of the solutions (products/services/systems) that are being tested by the student. Offering the student a real-life experience that would take months, years or even longer, through a game reality simulator that is fed with proper parameters and data from the real world is a potential tool to adopt. One factor that must be taken into consideration on the parameters in this game simulation is to make sure students understand that Humans are one of the species that inhabit this planet and more than often we forget about it, that we are part of nature like any other species that also share this planet. Re-incorporating nature in our urban lives is not an option. It is a need. Although, it may be the other way around as in re-incorporating ourselves in nature. Nature is far bigger than us humans, we are not here helping nature, we are fighting to survive and if we, as any other species, do not adapt to nature, we will fade away like any other species that has failed to adapt so far. And when thinking about adaptability is hard to avoid mentioning Darwin's work here, in the words of Megginson.

> Yes, change is the basic law of nature. But the changes wrought by the passage of time affects individuals and institutions in different ways. According to Darwin's Origin of Species, it is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself. Applying this theoretical concept to us as individuals, we can state that the civilization that is able to survive is the one that is able to adapt to the changing physical, social, political, moral, and spiritual environment in which it finds itself (MEGGINSON, LEON C., 1963)

In other words, it is not the adaptation of the planet that should be under work here as it has been the mindset since the Industrial Revolution but rather, the human adaptation to an ever-changing humanity that inhabits a planet that has its own limits. Humans should be able to adapt to their environment and to nature rather than copying or trying to act or manipulate nature. Our mindset must change. As ORR, D. (2017, p. 6) framed "ecological design then still exists as a patchwork in a larger society, not as a coherent solution to the systemic problems of a capitalist society". The economic and social so-called "progress" over the last century has been accompanied by environmental degradation that is endangering the very systems on which our future development and very survival depend. COVID-19 offers an opportunity to develop recovery plans that will reverse current trends and shift our consumption and production patterns to a more sustainable course. (UN - SDG, 2020). The lifestyle humans have adopted for approximately the last 260 years, counting from the First Industrial Revolution back in 1760, is unsustainable in many ways and levels as defended by the UN and its SDG: "the equivalent of almost three planets could be required to provide the natural resources needed to sustain current lifestyles".

> The emergence of COVID-19 has underscored the relationship between people and nature which essentially revealed the fundamental tenets of the trade-off we consistently face: humans have unlimited as so-called "needs" (created by consumerism and not real human needs), but the planet has limited capacity to satisfy them. We must try to understand and appreciate the limits to which humans can push nature, before the impact is negative. Those limits must be reflected in our consumption and production patterns (KUMAR, P., 2020).

3 PREPARING DESIGN STUDENTS FOR CHANGING OUR WORLD

Why focus on design students? To answer that question, it is important that we clarify two aspects that need to be addressed first, one is about what is lacking in our students in general? And the other, who specifically are "Design students"?

We use here the definition of Critical Thinking described by DAO, T. e HOCKE, J. (2021, p. 141) "the development of qualities necessary for students to understand themselves critically and act autonomously and critically in new contexts". The lack of the development of Critical Thinking within the educational system overall is old news (MCPECK, J, 1981; FACIONE, P. A, 1990; SIEGEL, H, 2010) and unfortunately, still far from becoming part of our reality (DAO, T.; HOCKE, J., 2021).

The idea that education and training should help students to develop the dispositions or attitudes deemed to be associated with critical thinking, as well as the ability to think well, has been connected with employers' alleged desires for school, university and college graduates who are curious, critical, analytic reflective thinkers – problem-solvers who are quick to learn, as well as flexible and able to add value to their organizations (PITHERS, R. T; R. SODEN, 2000, p. 238).

It is well known that in general when a student arrives at the university their mind has already been shaped to accept orders without questioning them, to think that there is only one right answer, to compete with their peers, and that whatever they may be really interested in is not important, the only important aspect is to be trained in the skills that are going to be useful to some organizations. A reality that is also shared by most tertiary education. Although, as explored by DAO, T. e HOCKE, J. (2021) obedience and docility in a culture will certainly affect how Critical Thinking is seen and developed, which means that for such countries, Critical Thinking may be seen as "aggressive" argumentation (Dao, T., Hocke, J., 2021, p. 141 apud Bailin and Battersby 2020, 2). It is important to keep this in mind when developing critical thinking in different countries as the local culture will influence directly on how critical thinking is seen and applied.

On the second point to be clarified, who are the "Designers"? As defined by Norman (2013, p. XII) "we are all designers in the sense that all of us deliberately design our lives, our rooms, and the way we do things", following this mindset we understand how broad the term "Designer" can be applied to and this is why, for matter of clarity, we narrowed it down to people that pursue a formal education in Design within a tertiary educational institution.

Here we apply the same understanding defined before regarding to Design as that it was born to put order in the industrial mess (CARDOSO, 2012); that it also acts as a tool of the art of persuasion that developed technological and psychological obsolescence only to generate profit for the system, resulting in one of the biggest problems of production and waste management, being both socially and environmentally harmful (Cardoso, Rafael (2012); Papanek, Victor (1972); Wilkinson, Pickett (2009); SCHWARTZ, B (2004); TAYLOR, C (2009); Santos, Walker (2014)). Moreover, we also understand that the designer must be aware of and responsible for the value and impact of their work on society and understand that their activity is characterized by taking political decisions that will define the weight, positive or negative, of that impact (GRALHA, 2018, p. 29-30). Even though in recent decades there has been a growth of more eco-friendly objects, they still don't dominate the shelves of stores. For design to participate in a positive way in the well-being of humanity it "must disengage itself from consumer culture as the primary shaper of its identity and find a new terrain where it can begin to rethink its role in the world" (MARGOLIN, 2014, p. 130).

Besides, it is important that design students understand that the so-called third world (over-exploited countries) is indeed rich, its people on the other hand, are poor (PARENTI, 2005), understanding other nations realities is needed when designing solutions. Each place has its own potentialities to be developed and its own problems to be solved, prejudices must be brought to light and dissolved. Moreover, it is clear that designers have a social responsibility to assume and do better. However, they're still taught to keep the status quo by serving and developing solutions to an unsustainable economic system that continues to degrade our own habitat and disregard any consequences, even when being directly confronted by them, as emphasized by most authors mentioned in this article so far. This paper focuses on design students as an attempt to fill the gap other young and not so young designers lack, more experience in understanding the consequences of their decisions, direct and indirectly over the course of time in a complex system (the relationship between our society and this planet). To do so, we offer a concept of a gaming tool that in a short period of time could potentially offer design students that the kind of experience without compromising the real world and real lives, just as medical students use dummies to practice performing surgeries, a simulation-based learning.

The Second Planet game can be used as a "technique, rather than just a technology that promotes experiential and reflective learning" (DATTA; UPADHYAY; JAIDEEP, 2012, p. 167) just as the dolls used by medical students (Figure 1). Students have the opportunity to understand quickly that their design decisions have direct consequences to the people and environment to

where their solutions are applied and why it worked or not while having the opportunity to correct the mistakes

Figure 1 – Birthing DOLLS train doctors to cope with pregnancy complications - and even come complete with 'blood' and a pained expression". Source: www.dailymail.co.uk

Change in a student's mindset ought to be a good starting point: as long as we allow ourselves and teach students to live and work for a system that rewards psychopathy "lack a conscience, have few emotions and display an inability to have any feelings, sympathy or empathy for other people." (BODDY, 2011, p. 256), most of us are definitely fated to live in misery. Much has been said about sustainability (About 1,380,000 results on Google Scholar from 2015 to 2020) and from many voices (BONSIEPE, 2011; CESCHIN; GAZIULUSOY, 2019/10; FISHER, 2004; GONÇALVES-DIAS; SANTOS; WANDERLEY, 2014; MARGOLIN, 1998; SINGAPORE, NATIONAL RESEARCH FOUNDATION -- NRF, 2016; PAPANEK, 1972) and yet little has been done when compared to what we needed to have done.

Another important definition to be made regarding how this Second Planet simulation game' concept is about what 'Social' work means as it does carry a great variety of meanings thus, creating a belief used by some professionals that their work has nothing to do with Social work/projects. Here are the definitions used to base this paper: according to Collins dictionary, "Social means relating to society or to the way society is organized.", on the Oxford dictionary, "connected with society and the way it is organized", on Cambridge "relating to society and living together in an organized way" and "relating to society and the way people live together". In short, 'social' here means the relationship among human beings regardless of the group size, either consisting of a small group of students in a specific school/classroom or an entire population that belongs and shares the same continent or, why not, planet. A more general approach as to

how social work is perceived and how it goes hand in hand with developing solutions for a complex system like the globalised society we live in. For a better comprehension we bring in the definition from Redig (2011) that points out that those who are involved in social work normally.

> […] are divided into two subgroups: one thinks that the way is to create (another) NGO focused on social assistance provided in stimulating sports, artistic and professional activities for the needy population of the hills of Rio de Janeiro. The other wants to stimulate the local economy, expanding and perfecting the city's production, trade and services, while the first wants to train professionals, the second wants to create demand for these professionals. The first calls itself social, but it is not, because it addresses only a part of the problems of part of society - even if it is huge, and its problems are also. The second, on the other hand, is social because it turns to the whole society, from the "lower" to the "upper" class, seeking to improve the economic living conditions of the city as a whole. While the second group seeks definitive, or structural, solutions, the first reaches palliative, or cyclical, solutions. (REDIG, 2011, p. 93)

Bridging this concept with the Second Planet game simulation, the intention is that in the game focus should "stimulate the local economy, expanding and perfecting the city's production, trade and services" by "seeking to improve the economic living conditions of the city as a whole" (REDIG, 2011, p. 93), moreover this economic advancement must not come at the expense of a deteriorating environment.

Even though there is a huge amount of design methodologies that claim to better humans' (users', clients') life just a quick look around the news will tell you otherwise. As empathized by Orr (2018) Designers' mission "would be to design social systems that work with, not against, natural processes. Imagine a civilization so artfully designed that it would protect prosperity, ecological processes, and the larger fabric of life on Earth, for as long as one can imagine." (Orr, 2018, p. 14).

4   METHOD AND DEVELOPMENT STRATEGY

Most of us have had the experience of watching a toddler throwing a tantrum at a public place, being aggressive, disobedient and disrespectful towards others. Usually it is understood that that child had too much attention from adults, that these toddlers have been given everything they wanted, whenever they wanted regardless of the consequences, and for assuming such behaviour, parents adopt physical punishment on their

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toddlers. Now, let's make a parallel here, has capitalism given too much attention to us humans by giving everything we wanted, whenever we wanted regardless of the consequences? Does that sound similar? Do we all deserve physical punishment? We humans have been a spoiled child of an economic system and we must acknowledge that this behavior is highly inefficient. We need to understand that we can't have everything we want, all the time, just because we want it while disregarding the consequences to others or to the global ecosystem.

Bringing the topic back to the game conception here developed, we intend to offer students with a tool that can offer them quicker feedback on the consequences of their design decisions, by helping "shape action for socially situated objects" (DAVIS, J. L., 2020, p. 6) which is roughly based on The Sims that is - a game that dynamically simulates an entire system of networks and focuses mostly on human relationships. It has been described as a human behavior or psychological simulator. Rather than employing purely player-inhabited characters or purely autonomous characters, the game puts players in the role of influencing semi-autonomous characters. They are semi-autonomous because while they have their own innate behaviors, they depend on player influence to dictate their actions. The viewpoint is isometric rather than first person, allowing players to have a god-like view over the game terrain (PEARCE, C, 2004).

As PEARCE, C (2004, p. 148) mentioned "The Sims is a cross between a dollhouse, a Tamagotchi, and the television program Big Brother", where the player will have a house and relationships to care for, a job or some sort of income to maintain its status and comfortable material lifestyle. The player can even be a thief in the game but it has to find a way to survive as the Sim can and will die eventually. The Sim will have their own free will to some extent and forcing it to do things it won't want to do, will cause the Sim to demonstrate problems such as irritation and depression. In the words of Pearce

> Sims' characters are built from a kit of character parts that induces various physical (mostly having to do with appearance), as well as personal traits. The emphasis here is more on personality than in skills, however. You can construct your own configuration of such traits as neatness, friendliness, etc., or you can select an astrological sign that will automatically configure a personality for you. Based on this, the character will have certain natural qualities and aptitudes. Your characters can also acquire skills that will enable them to avoid things such as kitchen fires, or improve their job performance, thereby earning promotions at work. Sims are very moody and when they aren't getting their needs met, they will throw tantrums, shaking

their fists and calling to you in "Sim-ish," a combination of verbal gibberish and symbols that appear in comic book bubbles over their heads. Images such as food, kissing, and recreational activities provide indicators of what Sims want or what they are conversing about. The Sims has taken a radically different approach to narrative than most of the games that preceded it (PEARCE, C, 2004, p.150)

The game has been used for scientific purposes such as behavioral sciences (KUHN, S *et al.*, 2018; LIN, 2015; TORNQVIST, 2015) for its database on a diverse range of possibilities on psychological and behavioral traits (Figure 2). The game offers an option that allows the player to select actions to be done by its Sim and forward time to see the consequences of all the actions that were made by the player and by the Sim itself as it has, to some extent, its own free will.

Figure 2 – Shows a small selection of the "Select Traits" option on The Sims. Source: The Sims official website

In addition to that human relationship simulation game, there is The Cities Skylines, which is a city simulation game that allows you to construct your city from the ground up. This game has been rated PEGI 3+ which means that it is easy to learn, but hard to master (Figure 3).

Figure 3 – A more complex city built in Cities: Skylines. Source: City Skylines official website

The player is the mayor of the city to be built and has to find balance in essential requirements such as education, water, electricity, police, fire fighting, healthcare and much more along with the city's real economy system. Citizens within the city react "fluidly, with gravitas and with an

air of authenticity to a multitude of game play scenarios" (Cities: Skylines on Steam).

What we argue is the development of a behavior life prediction game simulation, Second Planet simulation game, that uses as its basis the concept of both The Sims and Cities: Skylines parameters to be used as a tool on the development of a different behavior among students towards the solutions they propose. This Second Planet game can be built by using a human behavior database that is collected from social media and many other virtual tools, which will offer a simulation closer to real life in the real world. This allows students to try out their ideas/proposals/solutions and by doing so, having a laboratory to experiment their ideas, projects, products, systems etc, this would offer the students the opportunity to gather more experience while still in the university and offering better solutions later on as the life experience needed to provide those would be given, partially, by this game tool. Schools could use such a tool as a curricular component where the student would face real world problems and try to solve them in the game as a first step in the development of their projects prior to trying it out in the real world with real people where damages can not be undone. That would also minimize the use of unnecessary prototypes that may result in a wasteof material and time from all stakeholders.

The parameters involved in the Second Planet to evaluate the impact caused on the game by the student's solution can be based on the 17 Development Goals by United Nations, or guided by global goals to be achieved and based on studies that show how we can evolve human species to live better with nature to which all humans are part. For example, the Goal 11 "Sustainable Cities and Communities" aims to make cities and human settlements inclusive, safe, resilient and sustainable. Its Targets shall be fed into the game as metrics to indicate the effectiveness to be achieved such as the Target 11.1 that by 2030 aims to "ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums" (17 Development Goals by United Nations).

As a curricular component, students would have a semester/term to write a critical review on the consequences of their solutions tested on the simulation Second Planet game. Students should be prepared to think critically when joining the workforce upon graduating from an educational institution, although "Despite widespread agreement on its importance, classroom assessment methods do not often accurately engage and capture students' critical thinking skills." (SHIVELY; STITH; RUBENSTEIN, 2018, p. 151). To better assess student's critical thinking, Shively, Stith e Rubenstein (2018, p. 152) developed Eight Universal standards: 1- all reasoning has a purpose; 2- all reasoning is an attempt to conclude a problem; 3- all reasoning is based on assumptions; 4- all reasoning is done through a point of view (POV); 5- all reasoning is based on evidence; 6- all reasoning is shaped by constructs; 7- all reasoning contains interpretations by which we draw conclusions, and; 8- all reasoning has implications.

With these Eight Universal standards Shively aims to help teachers "evaluate students' abilities to apply these universal standards to their reflection, analysis, and evaluation" and have highlighted them in the rubric developed on Table 1.

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Table 1 – Components of Critical Thinking to Develop Assessment Criteria. Source: Shively K. (2018, p. 153)

	Novice	Developing	Expert
Summarizes topic or argument	Does not organize information, leading to inadequate understanding	Inconsistently demonstrates ability to organize information, leading to inadequate understanding	Consistently demonstrates ability to organize information, leading to adequate understanding
Considers previous as- sumptions	Assumptions are defined, but not explained as having significance to the position	Assumptions are defined and linked to topic ideas, but not clearly explained or elaborated upon	Assumptions are defined and linked to topic ideas, but not clearly explained or elaborated upon

Communicates point of view	Does not identify own position on the issue	Identifies own position on the issue, drawing support from experience	Identifies own position on the issue, drawing support from experience, and information not available from assigned sources
Provides evidence of research	No evidence provided to support argument	Accepts evidence at face-value, even if incorrect, inadequate, or misrepresented to support argument	Information is gathered from appropriate and credible sources to support argument
Analyzes data	No analysis of a topic. Student only lists or defines concepts of topic	Demonstrates ability to analyze and make interpretations of topic	Demonstrates ability to analyze and elaborate on interpretations of topic
Considers other perspectives and positions	No identification of other perspectives and positions	Identifies other perspectives and positions	Identifies and assesses other perspectives and positions
Draws impli- cations	Cannot explain or testify to the impact of new information	Explains or testifies to the impact of new information	Explains the impact of learning new information, making predictions, and generates new ideas
Assesses conclusi-ons	No reflection of idea evolution on argument development	Limited reflection of idea evolution on argument development	Extensive reflection of idea evolution on argument development

The limitation of the Second Planet game idea is still how to find a common ground on how to use behavioral data and how to effectively avoid the information to be backtracked to a specific individual. As well known, Mark Zuckerberg, Founder, Chairman and Chief Executive Officer of Facebook has been in court several times due to Facebook's privacy issues as people are not fully aware about how their private and behavioural information is being used (most of the time manipulating them into engaging into more consumerism behavior). We believe that using these behavioral data to contribute to the Second Planet game here proposed would not only help students change their behavior towards their social responsibility "as suggested by Jelsma (2006), designers need to take moral responsibility for the actions of people as a result of interactions with designed artefacts" Ceschin e Gaziulusoy (2019/10, p. 54). It also helps

developing a mindset focused on developing human evolution as long as people's information were to be used as randomized numbers and not being identified as the game does not need to pinpoint a specific person to produce results.

For educational matters the Second Planet game can be as important as simulation dolls are for medical students

> Simulation is the artificial representation of a complex real-world process with sufficient fidelity with the aim to facilitate learning through immersion, reflection, feedback, and practice minus the risks inherent in a similar real-life experience. (DATTA; UPADHYAY; JAIDEEP, 2012)

The Second Planet game concept should help reduce material, water, energy use and therefore, pollution in the process of learning to develop design solutions for a complex system like our society.

5   CONCLUSION

Designers' mindset needs to be changed into a social type of mindset, a focus that would improve human evolution instead of corroborating with its demise. As design school's responsibility is to develop those students' skills and guide them into what should be the best design decisions to be made as professionals, focusing on them is just a matter of practicality although the game could easily be used by any and all design professionals or even companies for a broader and quicker change.

Regarding three questions made earlier: Could we use a technological tool, in this case a game, to offer students more experience on the consequences of the solutions they propose? How complex would that tool be? What parameters to be used by the game simulation? The Second Planet game concept proposed has the potential of helping developing students' social responsibility by understanding the possible consequences of their solutions in society and to the environment. Furthermore, it allows students to comprehend how design decisions may impact in the complex world we live in and ultimately, giving students more experience while still in their college years.

The level of complexity for its development may not constitute a problem as it would not be a new tool but rather a tool that would allow a deeper complexity into its system. On the other hand, the amount of data needed to feed the game is an issue due to the level of behavioral data required. The game may not be viable in countries where the law towards privacy issues is not flexible enough. However, it's very important that people's privacy is protected and their data must not be backtracked to the individuals (from which the behavioural data is being gathered). As it is a matter of policies that vary from country to country, the Second Planet game would definitely raise discussion on privacy matters and also a good way to show that sharing data can be beneficial when used correctly.

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