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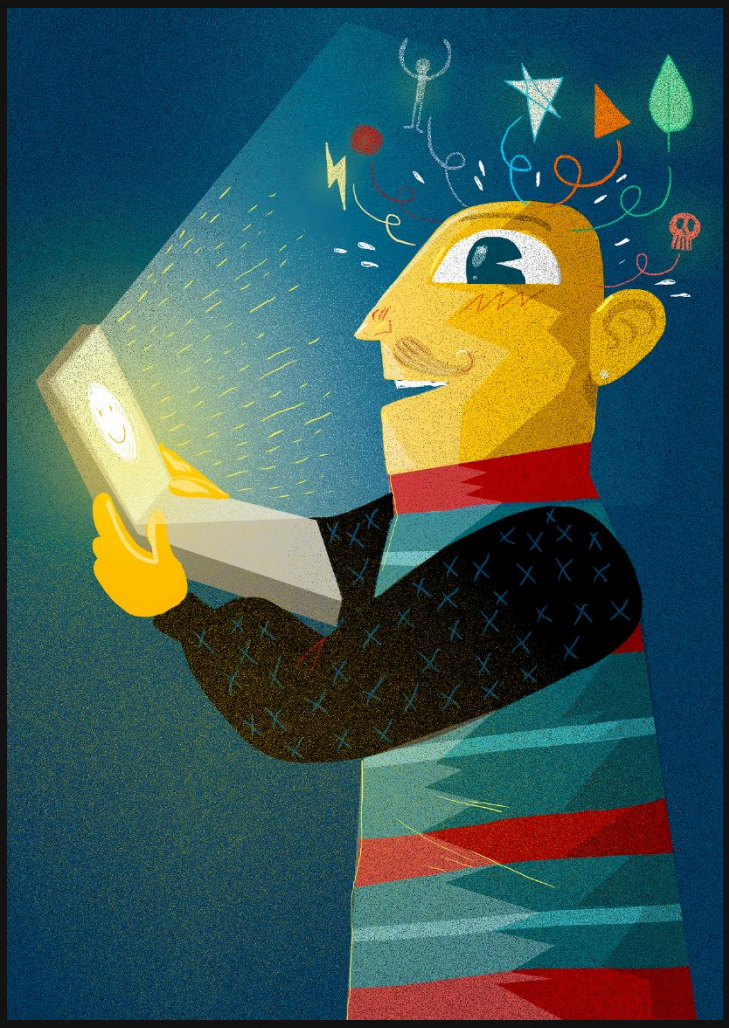

Untitled. Illustration by Gabriel Alayza Moncloa.

Special Issue

Revisiting Teaching and Games. Mapping out Ecosystems of Learning

edited by

Björn Berg Marklund, Jordan Loewen-Colón and Maria Saridaki

Issue 15 (2021)

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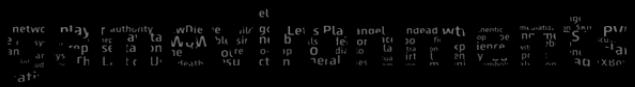

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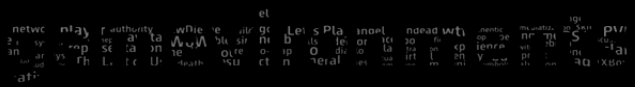

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Report

The Secret Chamber of Interdisciplinary Collaboration. Negotiating *OutSmart!* A Serious Game for Adolescents

Suzana Jovicic, Barbara Göbl and Dayana Hristova

Abstract
This report explores the challenges of interdisciplinary collaboration underpinning the participatory design of *OutSmart!* (forthc.) – a serious game developed for and with adolescents to reflect on their social media use. We scrutinize how the process can be organized to manage contradicting tensions between disciplines and methodologies. *OutSmart!* was the result of three years of research conducted by a social and cultural anthropologist, a cognitive scientist and a computer scientist. The research involved workshops, a survey, interviews and participant observation. The focus of the report lies on the workshops (including discussions and prototyping sessions) with Viennese high school students. First, we discuss interdisciplinary issues and learning processes within our interdisciplinary research team. Second, we present examples of our knowledge co-creation process with students leading to a further renegotiation of our research focus and methodology. These negotiations helped us to critically assess our underlying assumptions and to reflect on our positioning as researchers. At times, the playfulness of the game design approach pushed us beyond the comfort zones of our academic disciplines.

Keywords: Serious Game, Adolescents, Social Media, Interdisciplinarity, Design, Participatory Design, Co-Design, Anthropology, Cognitive Science, Computer Science, gamevironments

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The journey begins with a boy with messy hair and a chatty butterfly who has a lousy sense of humor. After the butterfly accepts the terms and conditions of a new app, the butterfly and the boy are sucked into a smartphone and must find their way out. Though reluctant, the boy must help the butterfly navigate worlds filled with social media icons, Wi-Fi trampolines, phlegmatic ghosts, and mafia hourglasses (any similarities to symbols featured in the social media app *Snapchat* (2011) are likely intentional). The likable but sometimes clumsy insect relies on the boy's help, who becomes its teacher and the expert of the social media worlds they navigate in an attempt to find their way out of the smartphone.

The story is the introduction of *OutSmart!*[i] (forthc.), and the boy[ii] is the game's main character, steered by a young player, at an intended age of 14 to 17. *OutSmart!* is a mobile and web-based, co-created serious game (a platformer/jump'n'run single player game) designed to offer adolescents a playful space to reflect on social media-related topics, such as gamification, marketing models, and privacy. The results of the collaborative research process[iii] underlying the game have been published elsewhere (e.g., Göbl et al. 2020, Hristova 2019, Jovicic 2021). This report takes a step back and reflects on the interdisciplinary issues and synergies that accompanied the participatory design sessions. The design process involved a myriad of human and non-human actors and elements – doctoral students from the fields of social and cultural anthropology, computer science, and cognitive science and their supervisors; alongside students and teachers from several Viennese schools; the virtual characters brought to life in character design sessions; as well as the materials that facilitated the process: smartphones, colorful papers, scissors, plastic bottles, glue, or lurid feathers. Here, we ask how this complex ecology can be organized to create a relevant playful and reflexive environment for all stakeholders.

First, we will briefly engage with the arguments from the field of Design Anthropology and Science and Technology Studies that provide some guidance on the question of interdisciplinary collaboration with opposing agendas, before discussing examples of collaboration within the interdisciplinary team as well as with students.

Background

In much of the literature on interdisciplinary collaboration between societal and technological approaches, the precise organization of interdisciplinary design processes is a) either not an explicit concern; b) there is a sense that the social sciences are represented as a *soft* data provider in Human-computer Interaction; or c) that computer science is conceived as a service provider in the context of digital humanities. For instance, Science and Technology Studies scholars David Moats and Nick Seaver argue that although many scholars have attempted to address such tensions through various frameworks (e.g., Irani 2015, Munk et al. 2019),

> "the horizon of possibilities in these interactions is often set by the more technically capable participants (Ruppert et al. 2015) rather than the 'qualitatively' oriented ones." (Moats and Seaver 2019, 3)

Typically, Moats and Seaver (2019, 3) note, developers set the tone through "normative stances regarding what counts as 'useful' or 'interesting'," in hackathons and data sprints for instance. In this process, qualitative scientists can become detached spectators, providing information useful for programming rather than in-depth co-creators or contributors of processual input. Conversely, scholars engaged in technology-critical approaches frequently remain in their echo chamber: while complaining that computer and data scientists are not aware of their research, they tend to write for audiences within the social sciences and humanities (ibid.).

Moreover, they tend to construct dichotomies in which they elevate themselves to ethical police, while data and computer scientists are imagined as unethical practitioners – a dualism that obscures and distracts from the actual tensions that exist in practice and prevents fruitful collaborative processes (ibid.). Cognitive Science, with its diverse interdisciplinary approaches, finds itself in-between: on the one hand lies its operationalization for data *thirsty* user research practices and on the other – its scientific endeavors and ethical concerns. In this project, we have encountered such tensions ourselves; tensions that can be utilized to gain insight into sometimes *uncomfortable* yet also fruitful collaborative work, rather than to reinforce reductive distinctions between ethical theorists and unethical practitioners.

These tensions are not surprising, as different disciplinary approaches may be based on contradicting histories, ontologies, epistemologies, and agendas. In the context of design and anthropology, for instance, agendas and methods seem to pull in opposite directions. Designers often aim to create specific impact and interventions, while anthropologists tend to avoid such impact, mostly committing to the role of observers and analysts (Gunn, Otto and Smith 2013). Moreover, in anthropology, as in other social sciences and humanities, there is a dominant model of the *lone researcher*, while design is deeply collaborative at its core (ibid.). Exploring these tensions is a critical precondition to addressing the immensely complex interplay of society, culture, technology, and design (Gunn, Otto and Smith 2013, Drazin 2013, Pink, Ardevol and Lanzeni 2016). In this research report, we follow the suit of scholars working at the intersection of these conflicting disciplinary forces and ask how we can creatively overcome such apparent dualism and learn from collaborations with our research partners and future *OutSmart!* players.

Researchers

We began with a simple premise: the game would address relevant topics related to social media as identified by participating students, and not merely predetermined by us, the researchers. To aid us in this endeavor, we would use a range of qualitative and collaborative methods. Data collection (through participant observation, interviews, workshops, and a survey) and development of the serious game through participatory workshops (figure 1, figure 2) in nine Viennese high school classes (N = 119, f = 60, m = 59, aged 14-17) informed individual scholars' work, aided by frequent discussions within the project team over the course of three years.

Here, the first challenge emerged. The qualitative research methods anthropologist and cognitive scientist applied, which take inspiration from Constructivist Grounded Theory (Charmaz 2014), are predominantly inductive, i.e., the topics identified as relevant by our research participants cannot necessarily be determined in advance. In the case of ethnographic fieldwork, this requires months, sometimes years, of in-depth engagement with the research field (Hammersley and Atkinson 2007) before findings can be confidently shared. In contrast, serious game development requires a clear and early focus on the learning objective (in addition to a *game* goal, or in this case, finding a way out of a smartphone) that determines the game's critical purpose. Early identification and definition of learning goals is often considered necessary to coordinate the interaction between pedagogical aspects and gaming implementation (Carvalho et al. 2015).

Figure 1. Prototyping sessions. Photo by the authors.

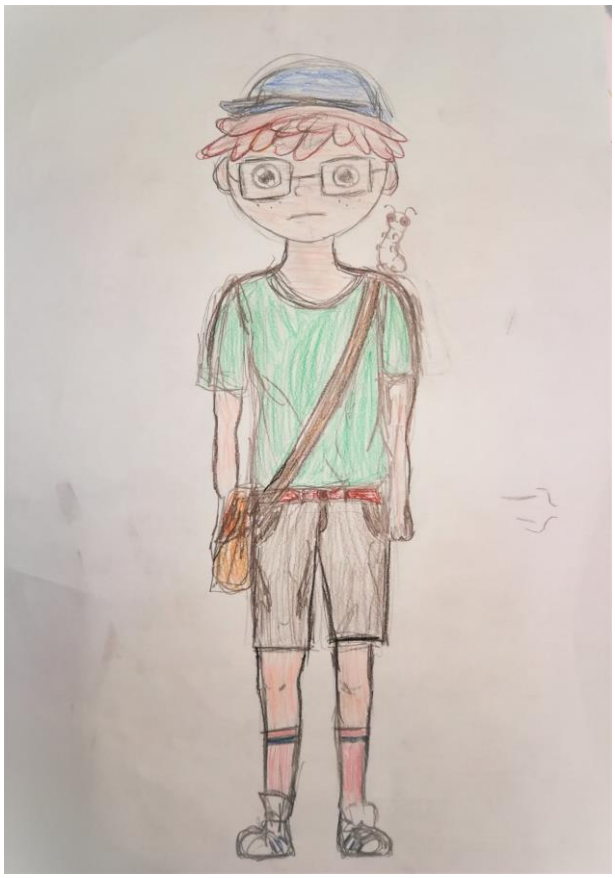

Figure 2. Player character sketch created by students during a prototyping session. Photo by the authors.

To consolidate these differences, we conducted early exploratory workshops, which allowed us to engage with our research participants and begin early prototyping of possible game concepts without many instructions to the students other than communicating basic game design principles, and the requirement to include themes related to social media into their prototypes. Besides the design-related value of conducting workshops for the creation of early game prototypes, the workshops also allowed us to calibrate our differing perspectives through mundane tasks: Instead of lone researchers meeting every few weeks with their own preconceptions, we all designed and ran the workshops together, learning as we went. Although each of us conducted their respective research alongside the workshops, the computer scientist asked questions and observed social interaction just as the anthropologist and cognitive scientist engaged in game design deliberations. Instead of tackling abstract goals, the team initially focused on everyday tasks, such as keeping students from falling asleep or keeping murders, hamburgers, and drugs out of the storylines of their game prototypes – tasks, where the input and support from the teachers proved invaluable.

Soon, however, we had to revisit the issue of learning goals. In a typical educational serious game, this goal may be well confined by specific facts or information that are playfully elaborated during gameplay. Evaluating such a game is similarly definable – one can assess players' knowledge through pre- and post-tests. In this case, however, our premise of eye-level dialogue was seemingly at odds with the notion of merely imparting information unto our learners. We were not there to simply *teach* students about social media, but to learn from them as the experts in their own social media use, thereby establishing a bidirectional learning loop. A similar challenge emerged when we discussed what alternatives can be offered instead of top-down information. For some games, for instance in the health sector, the learning unfolds through

behavioral change. This, however, conflicted with our premise of not steering students into behavior that we, as adults, defined as desirable. Although we could legitimize behavioral change to some extent by encouraging students to help us design a version of an ideal change that we all find acceptable (e. g., spending less time on social media), this approach essentially prescribes normative behavior, thus deeming it universal. At the same time, these dilemmas are neither abstract nor purely ideological – the game requires a learning objective to guide both us and our young co-designers.

These were the questions we discussed in endless meetings, each of us bringing our own ideologies, and research agendas to the table. In the first year of our collaboration, those discussions included misunderstandings that remained invisible at first, as we used different terminologies defined through our own disciplinary lenses and were oblivious to the lack of shared language, or to the fact that we attached differing meanings to the same words, according to the respective disciplinary background. This is best exemplified by the term *persuasive*. At first, we used it in various contexts, for instance to describe how social media persuades users to behave in a certain manner. Soon, however, different connotations started to emerge. For example, from a developer's perspective, if the game succeeded in persuading the players to engage in play and reach both the game objectives and the learning goals, it would reach its overall goal, otherwise it might just present a waste of everyone's resources. After all, games need to rely on persuasion, even if this means that certain design elements *nudge* the user to move in a certain direction to find the exit. Consequently, from the perspective of a serious game designer and a computer scientist, the term *persuasive* is positively connotated in this context, in fact, it is essential for the process. Moreover, in the context of serious games that rely on behaviorist models, persuading someone to engage in a behavior change (Fogg

2009), such as exercise and healthy eating, might represent a subjectively desirable form of *manipulation*.

In contrast, the social science constructivist perspective seeks to understand behavior, including power relations and political implications of social and technological issues, while avoiding exerting influence on the interlocutors' practices. Although the idealized notion that the researcher does not affect the field (and vice versa) has long been overcome in anthropology (Stodulka, Dinkelaker and Thajib 2019), the notion that the researcher may coax and manipulate behavior would raise major ethical questions among anthropological colleagues. Thus, engaging in designing persuasive environments seems utterly incompatible with an anthropological modus operandi, other than from a distanced and somewhat morally elevated position as a critic of behaviorist and paternalist agendas inherent to such games. Here, persuasion has a rather negative connotation as an extension of the *biopower* (Foucault and Gordon 1980, Rose 1998) of state actors and experts in their production of the ideal citizen – or in this case, ideal *digital natives* or youths who critically engage with social media and subscribe to discourses that attribute danger and laziness to seemingly unproductive and non-empowering digital practices (Jovicic 2021). From such a perspective, persuasion would patronize the users (Schüll 2016).

At first glance, this description of our own process seems to reproduce the dichotomy between "ethical critics" and "unethical practitioners" (Moats and Seaver 2019, 3), rendering the different ideological and methodological approaches irreconcilable. Yet, the dynamic boundaries between manipulation and necessary guidance lie on a continuous spectrum. Deconstructing certain practices alone, as typical of critical approaches, or merely following technical frameworks and models based on principles of efficiency, a historical trend within computer sciences (Suchman 2011),

paralyzes eye-level dialogue. Within the context of our game design, such abstract discussions quickly turned specific. The game needed us to find a common language, to document every aspect of the game in detail, leaving little room for vagueness. In other words, the specific design decisions moved us to crystallize our stances regarding ethical questions, to converge on solutions that we all find both ethical and enriching for our potential players.

So, we relied on the game to playfully find a way out of the cul-de-sac through a *secret chamber*. *OutSmart!*, our serious game (figure 3), consists[iv] of several modules dealing with various topics related to social media, which the player has to pass through. Before leaving the smartphone, the boy and the butterfly must reach a castle and fight the final boss. In this castle, a secret chamber is finally revealed; a chamber that reveals the *secret* mechanisms used in *OutSmart!* to direct the players. The idea is not only to display typical gamification mechanisms used in social media, but also to make transparent our own *persuasive* efforts in the environment of the game. Furthermore, to avoid employing game mechanics that keep the player in the game for an excessive amount of time, we have set intentional constraints to play time in terms of length. These decisions were a compromise that allowed us to apply game-inherent motivational and persuasive mechanics to enhance the gameplay experience and guide the player without necessarily reinforcing problematic practices used on social media platforms and in games, thus striking a balance between patronizing persuasion and necessary guidance. However, these negotiations were only half of the process. The other crucial half took place with our workshop participants.

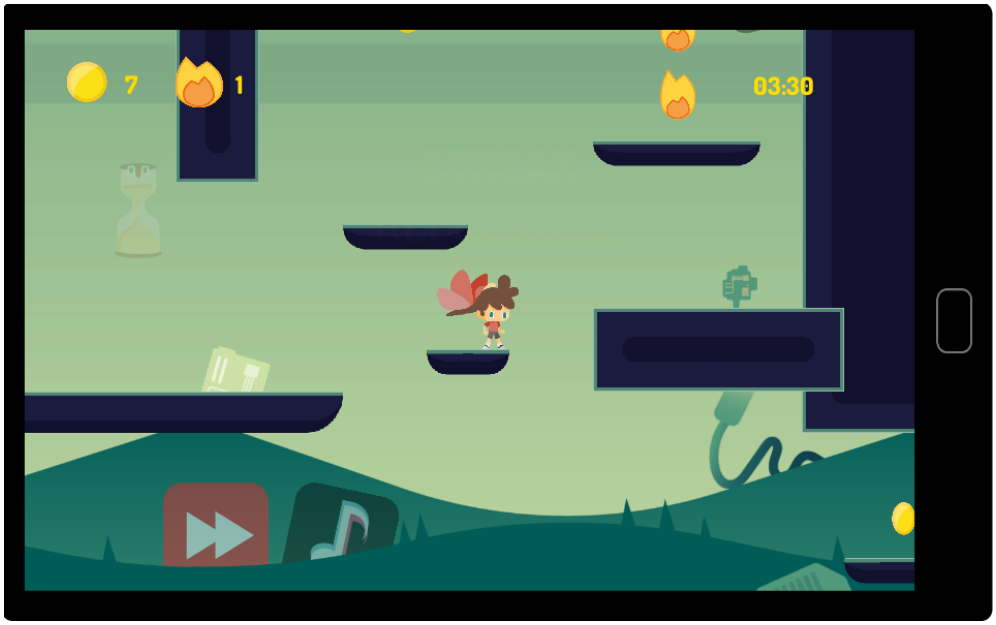

Figure 3. A Module of *OutSmart!*

Workshops

Negotiating topics of the game during the workshops had its own unanticipated obstacles. The workshops evolved with each session, based on our experiences and student's feedback, however the core consisted of group discussions and playful prototyping with various materials we introduced (such as colorful paper, markers, foil, clay etc.), or which students found in their environment, such as empty bottles. Initially, we delivered input on game design, marketing and business models and privacy in social media, which we increasingly shortened and replaced with creative exercises such as quizzes, and role plays to reduce obvious signals of boredom during our lectures and increase interaction (Göbl et al. 2020). In particular, the group discussions provided a platform to address issues related to social media and gaming in a group setting. They were helpful in highlighting nuances in discourses among youth in contrast to/and in response to popular discourses in the media.

Our workshop experience demonstrates how knowledge is negotiated and co-created in an open process, both theoretically and methodologically. For instance, in the first workshop, the research team began with an invitation to an open, non-structured discussion on social media. Not surprisingly, this invitation was met with silence. Not only did our initial method prove inappropriate, but it also highlighted an important digital literacy issue: Students seemed fed up with topics that had previously been presented to them mostly in a top-down, repetitive, and sometimes dismissive manner by adults. Mention of social media was occasionally commented on with *Oh no, not social media again* and eye rolling.

In order to overcome this silence and to spark discussion in the classroom, we started the next workshop with the viral motivational video *Look Up* by motivational speaker Gary Turk (2014) which makes a series of popular, placative claims about how social media is harmful to social life. Our goal was to bring an entertaining summary of common assumptions about digital media use – a viral YouTube video – into the classroom to stimulate the discussions we failed to inspire previously. The video's backstory follows a young man who crosses paths with a girl, falls in love with her, and leads a happy, heteronormative life. At some point, however, there is a dramatic twist: Time is turned back as the video reveals that the young man did not, in fact, meet the love of his life, as he did not *look up* from his phone when the girl crossed his path. The video is an emotional appeal to spend less time with our devices. Given the black and white narrative of the video, we expected a defensive response from the students. Instead, silence once again reigned, with a handful of students voicing agreement with the digital dystopia message. In a subsequent workshop elsewhere, we added a *Look Up* parody video (Tan 2014) to curb the discussion, turning all of

Turk´s statements on their head, introducing an alternative narrative and opening a discursive space for counterarguments. However, this strategy only inspired a few giggles and once again culminated in vague, superficial agreement.

Finally, with a different school class, we distilled the provocative statements from Gary Turk's original video and gave students green and red cards to raise if they agreed or disagreed with the statements as we read them aloud. The moment when students had to make a final decision and to take a (visual) stand was also a moment when monolithic assumptions about social media began to crumble. When asked if *online activities are less productive than painting or making music*, participants juggled the nuanced experience of everyday use of digital media technologies with popular discourses, while also highlighting the uncertainties that arose from trying to make sense of it. The following transcript demonstrates how they challenged each other's replies and pointed out contradictions with concrete examples:

Student A: "Yes, it [arts and music] is more productive than social media, but you still don't do it."
Student B: "Sure it's better, but..."
Student A: "I think both are productive."
Student B: "Yeah, but if you make music for example, it's not the same as using the social media all for yourself?"
Student A: "Yes, but when you do sports, for example, you do something for your body, so it's productive."
Student B: "You can also be creative online ... or make money".
Student A: "I watch Insta [Instagram] baking videos and save them for later and think 'I'll do that sometime,' but I never end up doing it even though I think 'really cool'...if you actually do it, it's productive, but just saving it..."
Student B: "But if the video is an inspiration to you?" (Student discussion, 1 October 2018)

Even students who initially agreed with familiar mainstream assertions against digital media (e. g., social media are not productive) began to question such generalizations, pointing out incoherencies and weaknesses of these statements while reflecting on their actual everyday practice. It was at this point that the process of knowledge co-creation emerged. By inviting them to reflect on stereotypes concerning the use of social media and smartphones, we also challenged our own biases early in the process. Their nuanced negotiations, for instance regarding the productivity of spending time on social media, further motivated us to reconsider the potentially patronizing overtone of our serious game. While participant observation and formal interviews allowed for more spontaneous conversations and insights in different settings, facilitated group discussions and creative methods allowed us to engage in an intense form of peer discourse. Oftentimes, these debates were in stark contrast to pervasive narratives within popular discourse.

As highlighted in the literature on co-designing serious games, an entirely democratic co-design process is not realistic, since designing serious games demands both game design and domain expertise and a lack of either may result in unsuitable contributions (Khaled and Vasalou 2014). Moreover, uncritically holding on to the ideal of entirely democratic co-design might obscure inevitable hierarchies of such encounters (ten Brinke 2019). Thus, in our participatory design sessions, we invited adolescents to contribute ideas and decide on specific game elements, but allowed ourselves to adapt problematic input at times and link ideas from different workshops together before re-evaluating the design with youths. Many student-developed prototypes were not suitable for the final version of the game due to reasons such as including content alluding to violence and illegal activities or, especially in early workshops with less specific instructions, missing a connection to the social media theme. In between workshops, the research team had to curate content in order to

present the output to the next group of participants, allowing them to evaluate and assemble previous students' and their own ideas in a coherent narrative within the context of our serious game – which was then translated into further design decisions. Moreover, the fact that we granted students the role of the experts was emphasized in the introduction to the workshops and integrated into the game design itself by taking advantage of the *protégé effect* which postulates that learning is more likely if the person is not being taught but teaches and informs others (Chase et al. 2009). The players are the experts who help the butterfly navigate the complex worlds; the players guide and are not lectured in a top-down manner. Instead, they *outsmart* the forces behind the malicious app that initially trapped them in the smartphone.

Conclusion. Reflexivity and Playfulness

Returning to the ultimate learning goal of the game – rather than simply informing or aiming to change behavior, *OutSmart!* opens up a reflexive space. The player traverses social media-inspired worlds, seeing their workings turned inside out rather than critiqued from a paternalistic point of view that alienates research participants weary of social media tirades. The game is not merely a *solution* that focuses on the digital tool and idealizes the promise of enlightening transparency, instead, it occasionally interrupts fast gameplay with slow sequences in order to raise questions. Thus, it gives players space and time to reflect on their own social media use without being presented with everything that is – from our perspective – negative or manipulative about social media.

It is not our goal to claim that this specific approach is a perfect solution to the issues we raised here and that this particular version of game design solves all problems. In our evaluation workshops, for example, we found that the tested module in itself had limited success in motivating players to reflect on their own social media use (Göbl et al. 2021). However, while giving feedback on the specific design elements and suggesting alternatives, students were vividly reflecting on the issues addressed in the game. Despite the limited ability of the game to encourage reflection on its own, the process of evaluating and re-designing the game itself enabled an effortless space for reflection. Similarly, the workshops, with equal participation from disciplines with different ideologies and agendas, were valuable experimental spaces for incorporating both the investigative, critical, and empathic sides of critical social science and the creative, innovative, and future-oriented sides of computer science (Gunn, Otto and Smith, 2013).

Overall, the playfulness of the game (process) allowed us to interweave our differences in a similarly playful manner. The game's *magic circle* (Huizinga 1938) had drawn us in and had created a third, hybrid space that does not solely belong to the researcher nor the users (Muller 2002). The materiality of technology (Sørensen 2009) – be it a piece of colored paper or the game design document – turned the design process into a playful space, while "ambient playfulness" (Hjorth and Richardson 2014, 54) of colorful materials, creative ideas and game prototypes added lightness to the tensions inherent in the process. Playfulness and creativity, involved in the design process, were not only essential to engage students, who visibly enjoyed playing with materials and creating stories and prototypes, but also for us. After all, design is not "merely a site of technological production, but an important process of cultural production and reproduction as well" (Smith and Otto 2020, 26). The material presence, a shared reality so to speak, of a game design document outlining design

decisions prevented us from hiding behind disciplinary codes and canons, much like class discussions were deepened by the presence of red and green cards that had to be pulled when we asked complex questions that had no simple answer.

Unlike commercial projects, however, we had no pressure to develop the next game blockbuster; we were outside the market pull or the expectations of the funding agency. In our project, enabled by a specifically interdisciplinary grant from the Austrian Academy of Sciences, we had the resources, namely the setting and the time to engage in a long process of negotiation, both between the different disciplines and with our research participants; to hold exploratory workshops and calibrate our terminologies over months and even years. There is no shortcut to this process. In addition to creating playful exploratory spaces with play, design, materials, methods, and ideologies, it is critical to create structures in which hierarchy-free, interdisciplinary collaboration is not only possible but also explicitly encouraged.

References

Carvalho, M. B., Bellotti, F., Berta, R., De Gloria, A., Sedano, C. I., Baalsrud Hauge, J., Hu, J. and Rauterberg, M., 2015. An activity theory-based model for serious games analysis and conceptual design. *Computers & Education*, 87, 166-181.

Charmaz, K., 2014. *Constructing grounded theory*. London: SAGE.

Chase, C. C., Chin, D. B., Oppezzo, M. A., and Schwartz, D. L., 2009. Teachable agents and the protégé effect: Increasing the effort towards learning. *Journal of Science Education and Technology*, 18(4), 334-352.

Göbl, B., Hristova, D., Jovicic, S. and Hlavacs, H., 2020. Serious Game Design for and with Adolescents: Empirically Based Implications for Purposeful Games. *Proceedings of the Second International Conference, HCI-Games 2020, Held as Part of the 22nd HCI International Conference, HCII 2020*, Copenhagen, Denmark, 19-24 July, 2020. Basel: Springer International Publishing, 398-410.

Göbl, B., Hristova, D., Jovicic, S., Kriglstein, S. and Hlavacs, H., 2021. OutSmart! Evaluation of a Serious Game and its Conversational Interface for Reflective Social Media Use. *GAME-ON 2021*, 22-24 September 2021, Aveiro, Portugal.

Hristova, D., Göbl, B. and Jovicic, S., 2019. The Social Media Game? How Gamification Shapes Our Social Media Engagement. In: Dillon, R., ed. *The Digital Gaming Handbook*. Boca Raton: CRC Press, 63-94.

Drazin, A., 2013. The social life of concepts in design anthropology. In: Gunn, W., Otto, T. and Smith, R. C. eds. *Design Anthropology*. London: Routledge, 33-50.

Fogg, B. J., 2009. A behavior model for persuasive design. *Proceedings of the 4th international Conference on Persuasive Technology*. April 2009, 1-7. DOI: https://doi.org/10.1145/1541948.1541999.

Foucault, M. and Gordon, C., 1980. *Power/knowledge: Selected interviews and other writings, 1972-1977*. New York: Pantheon Books.

Gunn, W., Otto, T. and Smith, R. C., 2013. *Design anthropology: theory and practice*. London: Routledge.

Hammersley, M. and Atkinson, P., 2007. *Ethnography: Principles in practice*. London: Routledge.

Hjorth, L. and Richardson, I., 2014. *Gaming in social, locative and mobile media*. London: Palgrave Mcmillan.

Huizinga, J., 1938. Der Mensch und die Kultur. Berlin: Bermann-Fischer.

Irani, L., 2015. Hackathons and the making of entrepreneurial citizenship. *Science, Technology & Human Values*, 40(5), 799-824.

Jovicic, S., 2021. Scrolling and the In-Between Spaces of Boredom: Marginalized Youths on the Periphery of Vienna. *Ethos*, 48(4), 498-516.

Khaled, R., and Vasalou, A., 2014. Bridging serious games and participatory design. *International Journal of Child-Computer Interaction*, 2(2), 93-100.

Moats, D. and Seaver, N., 2019. "You Social Scientists Love Mind Games": Experimenting in the "divide" between data science and critical algorithm studies. *Big Data & Society*, 6(1), 1–11. DOI: https://doi.org/10.1177/2053951719833404.

Muller, M. J., 2002. Participatory design: the third space in HCI. *The human computer interaction handbook: fundamentals, evolving technologies and emerging applications*, Mahwah: Lawrence Erlbaum.

Munk, A. K., Meunier, A., Venturini, T., Vertesi, J. and Ribes, D., 2019. Data sprints: A collaborative format in digital controversy mapping. In: Vertesi, J. and Ribes, D., eds. *digitalSTS. A Field Guide for Science and Technology Studies.* Princeton: Princeton Press, 472-496.

Pink, S., Ardevol, E., and Lanzeni D., 2016. *Digital materialities: Design and anthropology*. London: Bloomsbury Publishing.

Rose, N. S., 1998. *Inventing our selves: Psychology, power, and personhood*. Cambridge: Cambridge University Press.

Ruppert, E., Harvey, P., Lury, C., Mackenzie, A., McNally, R., Baker, S. A., Kallianos, Y., and Lewis C., 2015. Socialising big data: from concept to practice. *CRESC Working Paper Series* (138). Available at http://hummedia.manchester.ac.uk/institutes/cresc/workingpapers/wp138.pdf, accessed 28 November 2021.

Schüll, N. D., 2016. Data for life: Wearable technology and the design of self-care. *BioSocieties*, 11, 317-333. DOI: https://doi.org/10.1057/biosoc.2015.47.

Snapchat, 2011. [mobile app] (Android, iOS) Evan Spiegel, Bobby Murphy and Reggie Brown, Snap Inc.

Smith, R. C. and Otto T., 2020. Cultures of the future: Emergence and intervention in design anthropology. In: Smith, R. C., Vangkilde, K. T., Kjærsgaard, M. G., Otto, T., Halse, J. and Binder, T., eds. *Design anthropological futures*. London: Routledge, 19-36.

Sørensen, E., 2009. *The materiality of learning: Technology and knowledge in educational practice*, Cambridge: Cambridge University Press.

Stodulka, T., Dinkelaker, S. and Thajib F., 2019. *Affective dimensions of fieldwork and ethnography*. Cham: Springer.

Suchman, L., 2011. Anthropological relocations and the limits of design. *Annual review of anthropology*, 40, 1-18.

Tan, J. H., 2014. *Look Down*. [YouTube] 11 May 2014. Available at: https://www.youtube.com/watch?v=9Jhd3HXcaEk&t=2s, accessed 12 March 2020.

ten Brinke, S., 2019. Attuning Engagement: Methodological and Affective Dimensions of a Failed Collaborative Research Project in Timor-Leste. In: Stodulka, T., Dinkelaker, S. and Thajib F., eds. Affective dimensions of fieldwork and ethnography. Cham: Springer, 263-278.

Turk, G., 2014. Look Up. [YouTube] 25 April 2014. Available at https://www.youtube.com/watch?v=Z7dLU6fk9QY&t=187s, accessed 12 March 2020.

OutSmart!, forthcoming. [video game] (Android, PC) Barbara Göbl.

[i] The game's code is based on the Unity game engine and will eventually be publicly available.
[ii] In further iterations of the game, we would have added other genders to personalize the player options.
[iii] The research was funded by the Austrian Academy of Sciences. The game development was financially supported by the Department of Social and Cultural Anthropology, University of Vienna.
[iv] So far, one module has been developed and tested (Göbl et al. 2021).