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Playing Out Diplomacy – Gamified Realization of Future Skills and Discipline-Specific Theory

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Abstract

Future horizons, shaped by unpredictable ecosystems and exponential automation, require discipline-specific as well as transdisciplinary skills to navigate. In the context of political science education, negotiation simulations, for example in the form of board games, can aid in developing both. As a plausibility probe for wider investigations, we set out to research whether an International Relations course concept utilizing the classical board game Diplomacy with pedagogically altered rules and

gaming conditions enhances students' (n = 23) understanding of discipline-specific knowledge and future skills. We utilized a conceptual pre-post measure as well as free-form learning diaries to investigate development in participants' conceptual understanding and future skills along the course. The results tentatively suggest quantifiable and qualitatively observable changes in the discipline-specific conceptual, as well as more broad-based competence level. The gamified learning environment provided students with an activating and engaging learning environment that better acquainted them not only with discipline-specific theory, but more importantly, also with skills regarded important for their future.

Keywords *active learning • diplomacy • future skills • gamification • IR • learning environments*

Introduction

The complex and ill-defined problems of our time, such as solving climate change, global pandemic crises, digital automation and the rise of Artificial Intelligence (AI) as well as global inequality, require increasingly practical solutions. In addition, these should be able to efficiently make use of the multifaceted disciplinary knowledge acquired through generations of research in an interdisciplinary, phenomenon-based manner (Messerli et al. 2019; Brown et al. 2010; Messner, Schlacke, Fromhold-Eisebith, Grote and Matthies et al. 2019). Automation of work and increasingly complex AI systems are factors that will radically transform the global landscape in the near future (Messner et al. 2019). It has been hypothesized that fourteen per cent of existing occupations are at high risk and a further thirty two per cent at substantial risk of being automated in the next fifty years, with a total of forty seven per cent of jobs eventually lost or transformed (Nedelkoska and Quintini 2018; OECD 2018). This presents an unfamiliar environment for future professionals, in which they need to possess the relevant discipline-specific, as well as interdisciplinary knowledge and skills to be able to navigate effectively and independently (OECD 2018, 2019; Lonka 2018).

Although job transformation is projected to be especially significant in manufacturing and agriculture, the entry-level positions of low- and middle-skill routine jobs also at risk present challenges for the integration of highly educated youth to working life (OECD 2018). The “engineering bottlenecks” of the future (Frey and Osborne 2017), i.e. tasks that are especially difficult to automate include ones requiring creative intelligence and original ideas as well as social intelligence, understanding human actions in social contexts and assisting and caring for others (OECD 2018). In addition, the irregular, analytic tasks related to the implementation, maintenance and use of new technology are increasingly prevalent as the automation is initiated. The German Advisory Council on Global Change, in their extensive report on the projected transition to the ultimately “digital Anthropocene”, emphasize “broad content and personal competence” as necessary to adapt to these new kinds of complex and agile working environments, in addition to the above-mentioned skills. They present three central dynamics of the Digital Age, with the included risks of digitally empowered totalitarianism and autocracy, total surveillance and eroded freedom as ultimately disrupting social cohesion and democracy, alongside the acutely obvious ecological crisis and the ultimate existential threat to *Homo sapiens* through the rise of artificial superintelligence (Messner et al. 2019). All of these dynamics and the associated challenges are already visible in the modern world; AI development is rapidly generalizing from the narrow, content recommendation algorithms, and the fabric of democracy faces mass-scale undermining of facts and (scientific) knowledge, through what have been called even actual “lie machines” (Howard 2020). The challenges brought about by increasing automation naturally require new solutions also on the part of governments, e.g. innovative income distribution solutions to help citizens adapt. Legal entities and concepts are in need of comprehensive (re-)assessment in the age of big data, eroding privacy as well as the potential of human-machine –interfaces and cybernetics with many different plausible, possible and desirable futures (Messner et al. 2019; Voros 2003.)

Trying to keep up with these recent trends, curriculum design has taken a more global scope—from the transmission of detailed, factual information towards more broad-based skills and competencies projected to be important in the future world. The central elements in these frameworks are somewhat similar across institutions, and the Organisation for Economic Co-operation and Development (OECD) Learning Compass 2030 (2019) depicts the essential features of these quite thoroughly. The OECD-framework emphasizes factors such as multifaceted conceptual knowledge (disciplinary, epistemic, procedural and interdisciplinary), skills (socioemotional, cognitive and metacognitive, as well as practical and physical, such as digital skills), attitudes and values (personal and collective), transformative competencies (creating new value, reconciling tensions and dilemmas and taking responsibility), (co-)agency as well as working in evolving cycles of anticipation, action and reflection. A central goal is that of pro-societal participation and responsibly enhancing the world through one's influence on people, events and circumstances (OECD 2019).

As repetitive and tedious factual memorization is increasingly outsourced to better-performing computers (i.e. Nedelkoska and Quintini 2018), the released cognitive capacity can be put to better use in solving ill-structured, practical problems relevant to all disciplines and professions (Head 2008; Brown et al. 2010). In the context of higher education, apart from more occupational training programmes, such as medicine (Barrows 1996), in most academic disciplines, theory is still taught in a way that is rather detached from practice, which prevents it from effectively transferring between different practical contexts and being understood more systemically and even programmatically. One such discipline is that of political science. In its sub-discipline international relations (IR), teaching tends to be theory-driven, especially in Europe (see e.g. the widely used textbook by Jackson et al. 2019; Mattlin forthcoming). However, decades of research on learning and instruction point to the importance of activating previous mental models and experiences in a meaningful context, with practical connections to incorporate new knowledge on a deeper level that transforms perception and also transfers into meaningful practice (Bereiter and Scardamalia 2003;

Gick and Holyoak 1983; Hidi et al. 2004; Ito et al. 2013; Marton and Säljö 1976; Scardamalia and Bereiter 2014; Vosniadou 2009). Furthermore, so-called epistemic emotions of an activating nature, such as curiosity, interest and even confusion, have been found to effectively promote learning, and this is why learning environments that excite these emotions are so effective (Ketonen 2017; Csikszentmihalyi 1996; Heuer and Reisberg 1992; Muis et al. 2015; Pekrun 2014).

One commonly used means of activating instruction and creating more engaging learning environments (see Lonka and Ahola 1995; Lonka and Ketonen 2012), is the use of games and gamification (active learning). Games are naturally engaging by awakening various (epistemic) emotions, such as interest and curiosity, as well as effectively challenging pre-existing mental models. The Diplomacy-game by Avalon Hill (Hasbro), is one negotiation simulation that has proven effective in university teaching of IR, both with regard to practical skills and in imparting theoretical knowledge (Asal et al. 2019; Bridge and Radford 2014; Mattlin 2018; Rittinger 2018; Mattlin forthcoming).

Diplomacy offers a general simulative environment for the teaching of IR theory, which better presents the systemic and computational dynamics of the different theories to the students. Such pedagogical interventions are hypothetically effective in transferring abstract-level knowledge and thinking in foreign policy decision-making to the real world, which has been found challenging with more traditional instructional methods (Loggins 2009). This, in turn, is essential in developing students' skills needed to adjust to the above-described working life of the future, as well as also the opposite, in developing the future systems and institutions with the working theory and best practice of modern political science in mind. However, there are also risks that arise through using this sort of potentially competitive and emotionally arousing educational method, as students might adopt a certain mode in their thinking solely focused on winning and not so much on learning—the so-called “gaming the game” –phenomenon (Frank 2012). Similarly, the “seductive details effect” has been studied in educational psychology in relation to attractive but contextually detached situational details

in instruction (e.g. jokes or off-topic remarks) that captivate attention but are distractions from the main content being studied (Hidi and Anderson 1986; Sundararajan and Adesope 2020). One recent study also found little statistically significant evidence for (online) games being better than other instructional forms in teaching global empathy (Raymond et al. 2018).

Research questions

In this paper, we set out to investigate the learning outcomes of utilizing the Diplomacy –board game in the teaching of international relations (IR) and in light of the OECD-framework (2019) to systematically examine what kinds of future-relevant, broad knowledge, skills and personal competencies this type of unplugged negotiation simulation might develop when integrated seamlessly with more traditional methods. A game-based IR course concept, further described below, through offering also a systemic, simulative point-of-view to the theoretical content, was hypothesized to not only increase the discipline-specific knowledge of the participants, but also enhance the practical application of these discipline-specific concepts and, simultaneously, strengthen their more broad-based future skills and competences.

Our research questions were:

1. Does the IR course concept, built around the Diplomacy –board game, successfully support learning of discipline-specific conceptual knowledge and its application?

Our first hypothesis was that the pedagogically innovative course concept not only supported the learning of discipline-specific concepts but also their effective transfer through the enacted application in a simulated environment.

2. Does the course concept successfully support the development of students' future skills?

Our second hypothesis was that the course concept consolidated also the development of important future skills (such as social, emotional and cognitive competence, as well as value-based agency;

OECD 2019), through the enacted application of discipline-specific theory in a simulated environment.

Research design and data

This section describes in more detail the research context and design, study participants, quantitative and qualitative data as well as analyses used in exploring the research questions.

The gamified course concept of IR

A particular course concept that builds around the board game version of Diplomacy has been taught over the course of five years in two different universities in Finland (Mattlin 2018; Mattlin forthcoming). In this version of the game's pedagogical application, the game is fully integrated into the instruction within the IR course. Teaching and playing proceed intermittently throughout the course. The course consists of compulsory course readings (equivalent to two short textbooks), lectures that always include small group discussions in a fixed format, followed by a game session. After each lecture and game session, students will get a compulsory debate assignment that is done in an online learning environment (Moodle) before the next lecture. The course reading is split up in thematic segments. Each week's lecture and game sessions relate to the same theme. The game is designed to be played in teams of two, but it can also be played individually.

The course concludes with a thorough debriefing and feedback discussion. After the end of the lectures, students complete the writing of a learning diary, where they are encouraged to weave together the different course elements to demonstrate their learning of the essential course content ("*China's rise, diplomacy and the future of international relations*"). What particularly separates the use of Diplomacy on this course from other courses that have used it for teaching purposes, is that the game is adapted in several ways to make it more pedagogically useful (see Mattlin 2018), and

more suitable in teaching a broader range of theoretical IR content, by integrating theories directly into the game and its win rules (Mattlin forthcoming).

In the beginning of the course, students are explained the general learning objectives, and also given a general idea of what purpose the game serves in the course. However, many of the finer pedagogical points are not explicitly divulged yet at this point. During the feedback discussion at the end of the course, students gain a better insight into the pedagogical purposes of the course concept. At this point, they may also themselves already have discovered and pondered some of these pedagogical uses. These insights are then further deepened when students complete their learning diaries. After completion of the course, the teacher has sometimes shared an earlier pedagogical research article on the course concept with the students. Future skills, however, are not explicitly mentioned in any discussions with the students. One of the major objectives of the course is related to strengthening practical skills of analysis, debate and negotiation, through several forms of active learning. Students get a first-hand experience of what it might be like to act as a diplomatic negotiator with all the pressures, risks and uncertainties that it involves. They get to hone their skills at negotiation and at reading and deciphering other people's social signals and intentions. In the process, they may also discover something novel about themselves, and how they react under such stressful circumstances.

Study participants

The research was carried out across two implementations of the above-described course concept in two Finnish universities: the first one in the fall semester of 2018 ($n = 7$), the second in the fall of 2019 ($n = 16$). Using the same research design twice and in two different universities we aimed at increasing the reliability of the results and the consistency of conclusions. However, as is common in intensive research on pedagogical interventions in university teaching, the combined n of the study is still rather small, which limits the conclusions that can be made. The empirical part of this study is

therefore to be seen as a plausibility probe case study, or at most a pilot study, rather than a study from which statistical inferences can be drawn. Empirical plausibility probes, as Eckstein put it, are “*preliminary, rather loose and inconclusive, but suggestive tests, before more rigorous tests are conducted*” (Eckstein 2000, 142; Eckstein 1975; see also Levy 2008, 6-7). As such, it can only provide indicative empirical evidence for what kinds of results might be expected from a study with a larger data-set.

All 23 students were informed about the research to be conducted in conjunction with the course before the course started. The purpose and voluntariness of the research was explained to participants and there was a Q&A. Students were informed about their rights as research subjects, the anonymization and data management process of the material and the procedure of possible withdrawal, as well as that participation (or non-participation) would not affect their grade in any way. All the research participants signed a consent form for the study. From both data collections, all of the students (n = 23) consented to participating in the study. However, some opted out of additional permission (or did not return a second consent form) to also use their learning diaries as research data.

The study thus comprises data with a total of 23 subjects (15 female and 8 male), of whom 17 students also allowed the use of their learning diaries as research material and 19 answered both pre- and post-questionnaires. Out of these participants, 13 were majors in political science. Other majors included subjects ranging from Chinese language and contemporary history to data science. The participants’ ages ranged between 20 and 31 (median = 23). 12 reported studying in the Bachelor’s program and 11 in the Master’s phase.

Materials

The research material was both quantitative and qualitative in nature. The participants filled in the corresponding pre- and post-course questionnaires (which were later scored), in which they were tested on five discipline-specific concepts tangential to the most central material of the course (i.e.,

bounded rationality, security dilemma, groupthink, Jus ad bellum and deterrent). Students had not been given any advance information about the tests, nor prepared for them. On the pre-test, there had, however, been a mention that students would answer the same questions after completion of the course, but students were not reminded of this later during the course. The concepts all appeared at some point during the course, either in class, in the course literature, or the online discussion assignments. However, no special effort was made to memorize them, nor was particular attention drawn to them. Students had ca 5 minutes time to fill in the test. The tests were done in a pseudonymised way, and were not part of the course evaluation (which the students were also told), so there was no particular incentive to do well, nor any penalty for doing poorly.

Another research material consisted of learning diaries that also served as the course's main assessment assignment. After first having been graded, the learning diaries were used to investigate the students' spontaneous reflections relating to the application and transfer of discipline-specific knowledge and the development of future skills. The learning diaries were free in format and thus varied a lot in terms of how much and in what manner they covered the Diplomacy –board game situations and the related learning process. The students were guided to reflect on what they had learned during the lectures, game sessions and online discussions, and to integrate the various course elements in their diary in a creative way. The students were thus not specifically instructed to reflect on specific concepts or skills developed, and they wrote their texts simply to demonstrate their overall learning to complete the course. The qualitative data related to the phenomena assessed is thus unobtrusive and naturally occurring in nature (Webb et al. 1966), since any reflections with knowledge applied or regarding skills developed were reported spontaneously by the students. All the diary authors were non-native English speakers.

Analysis

Examining the learning of discipline-specific concept knowledge

The pre- and post-test concept definitions were assessed and rated by using three independent reviewers (IR professors unrelated to the course or the research project) in a blinded setup covering the pre—post as well as respondent and group dimensions. Thus, the raters did not know from whom the response was, if the answer had been given before or after the course, nor specific background information regarding the respondents. They received a single Word-file, in which students' answers had been reproduced in the exact same form as they had been written on test forms (including all typos), pseudonymised and reordered randomly. The reviewers graded the definitions on a 0—1 scale, 0.00 indicating “*a complete miss*”, 0.25 = “*somewhat on right track*”, 0.5 = “*grasps the basic idea*”, 0.75 = “*nearly complete*” and 1.00 = “*textbook definition*”. Empty/blank responses were rated as zero points. Thus, if the student had answered by giving perfect textbook definitions for all concepts, the maximum test points would have been five. Empty/blank responses were rated as zero points.

In each concept, Cronbach's alphas were calculated to determine the internal consistency of the raters. In concepts 1—5, the alphas were .64, .91, .90, .92 and .93 in the pre-test (N = 23) and .92, .91, .91, .91 and .91 in the post-test (N = 19), indicating adequate to excellent reliabilities of the combined scoring of the three independent raters. Hence, the independent ratings of the concept definitions showed good to excellent internal consistency among the raters and consequently sufficient reliability in the quantification of the qualitative responses.

The analyses of the test scores were implemented using IBM SPSS Statistics version 25.0.0.1. The mean scores and the standard deviations for the pre- and post-tests for each concept are presented in Table 1. The non-parametric Wilcoxon signed-rank test was used to compare the repeated measurements to assess whether the mean ranks differ, i.e., whether these students' knowledge in the concept definition test would change during the course (RQ1). In the statistical analyses, the largest

possible number of participants were included (19 participants' post-test data was available for the research).

Examining the development of future skills, including applied discipline-specific understanding

In order to examine the application of discipline-specific knowledge and the development of participants' future skills during the course, their learning diaries were analysed using qualitative content analysis with an abductive, theory-driven strategy based on the 2019 OECD-framework categorization (Krippendorff 2004; Patton 1990). The naturally occurring reflections in the learning diaries were interpreted as samples of the learning process on multiple dimensions, covering, in addition to the discipline-specific content knowledge, also the more broad-based skills applied and developed (Webb et al. 1966).

Analysis of the diaries occurred in two phases. In the first phase, the learning diary reflections regarding a) discipline-specific conceptual change and b) future skills in general were indicated with codes in Atlas.ti version 8. Altogether 188 quotations were identified across 15 diaries (two participants did not spontaneously reflect on the game or related learning in their learning diaries). In the second phase, each extracted quotation was then classified under the specific category of future skills (OECD 2019) it was seen to most closely represent. A table was constructed according to the OECD future skills framework (Table 2), and the quotes best representing each category were selected, along with the more general conclusive characterization of the skill's visibility in the data. In this phase, multiple overlaps between the quote classifications were also addressed to the best possible extent. Table 2 presents a synthesis of this analysis along with the best fitting quotes for each conclusion.

To enhance the reliability of the classification, the second phase of analysis was conducted by all the authors, and the first phase by two of the authors, including analysis of discipline-specific knowledge within the field of IR by the co-author working in the field. The unprocessed, qualitative

learning diary data coded under “future skills” in Atlas.ti is also presented in a quantitative format in Figure 1 to help the reader assess the reliability of the analysis by providing a more unsupervised look into the raw data. With the case of 17 subjects, a by-word frequency over 17 would mean that the (syntactically exact) term might be included in *all* of the subjects diaries and a frequency over 9 that the word might be in *most* diaries. We chose to limit the included word frequencies to 7, since there were also multiple syntactical derivatives, as we chose not to process these further based on semantics, at this point. We also excluded from the figure so-called “stop words” (Rajaraman and Ullman 2011) that were deemed irrelevant for this context of analysis. In the figure, the colours used to indicate the three OECD-framework categories were hand-coded by the authors to enhance figure readability as well as the alignment of the conclusions with this quantified, unsupervised look into the data. In this process, each syntactically exact term was checked in their natural semantic contexts in the data as well as the analysis framework.

Results

This section will explore the results of the study as they relate to the discipline-specific learning outcomes and future skills acquired through the course concept applying the Diplomacy –board game. We first report the change in participants’ concept knowledge quantified with non-parametric tests. Subsequently, we peek deeper into how the participants’ personal reflections on discipline-specific theory were affected by the course concept, as well as how it developed their future skills (OECD 2019).

Quantified learning outcomes in discipline-specific concept knowledge

The Wilcoxon signed-rank test showed that overall the increase in concept definition test scores was statistically significant ($N = 19$, $Z = -3.50$, $p < 0.001$, $r = 0.80$). The aggregated means of scores before and after the course were 1.04 and 1.80, respectively. A more detailed examination of each concept

definition revealed that the increase in test scores was statistically significant in *bounded rationality* ($Z = -2.26$, $p = 0.024$, $r = 0.52$), *security dilemma* ($Z = -2.02$, $p = 0.043$, $r = 0.46$) and *Jus ad bellum* ($Z = -2.82$, $p = 0.005$, $r = 0.65$), whereas in *groupthink* ($Z = -1.08$, $p = 0.281$, $r = 0.25$) and *deterrent* ($Z = -1.92$, $p = 0.055$, $r = 0.44$), no statistically significant differences in mean ranks were found. Thus, the scores in three concept definitions (as well as the overall test scores) changed significantly between pre- and post-tests in terms of increasing discipline-specific knowledge.

Table 1. Results of concept definition pre- and post-tests (N = 19).

<i>concept</i>	Pre-test		Post-test	
	Mean (<i>SD</i>)	Empty responses	Mean (<i>SD</i>)	Empty responses
<i>bounded rationality</i> *	0.07 (0.13)	37 %	0.18 (0.25)	53 %
<i>security dilemma</i> *	0.21 (0.34)	0 %	0.38 (0.42)	16 %
<i>groupthink</i>	0.24 (0.27)	16 %	0.32 (0.30)	16 %
<i>Jus ad bellum</i> **	0.21 (0.31)	42 %	0.40 (0.36)	26 %
<i>deterrent</i>	0.31 (0.33)	32 %	0.53 (0.48)	11 %
<i>all definitions</i> **	1.04 (0.99)	25 %	1.80 (1.20)	24 %

Note: The mean refers to the average of the points given by the three external evaluators for each concept definition on a zero-to-one scale (in *all definitions*, the aggregated score across all five definitions). If all students had answered by giving a perfect textbook definition, the maximum would have been 1.00 for each definition (5.00 for *all definitions*). Empty responses refer to how many students left the answer blank.

* difference in pre- and post-test scores was statistically significant at the $p < .05$ level.

** difference in pre- and post-test scores was statistically significant at the $p \leq .005$ level.

Qualitative aspects of the discipline-specific understanding and future skills developed

We next report the results of the qualitative analyses on how the participants' 1) core foundations of future skills (disciplinary and interdisciplinary knowledge, skills, attitudes and values), 2) transformative competencies (creating new value, reconciling tensions and dilemmas, taking responsibility), as well as 3) agency in anticipation action and reflection, developed during the course (OECD, 2019). Participant IDs are indicated alongside appropriate quotes with the first part containing the year of course completion (i.e. 19_ or 18_). Some of the result descriptions contain additional animating idioms, terms or statements (in quotation marks) that are derived in the exact form from the learning diary materials outside the longer quotations. In these cases, the participants whose diaries these quotations are derived from are indicated in brackets. Table 2 presents a synthesis of the qualitative analysis of students' free-form learning diaries on how the course concept managed to enhance their future skills, in light of the OECD-framework (2019).

First, however, in order to glimpse into the raw, textual data, Figure 1 presents us the unprocessed, future skills –related learning diary material in a quantitative format. The by-word frequencies are indicated with different relative sizes and the broad, OECD-framework categories analysed with three colours in the figure. Note that the most frequent word in the data, “game” (n = 88) indicates how the future skills –coding implemented was indeed related to the learning diary reflections concerning the board game –part of the course and, as this word is thus relevant to all the different categories, it was left uncategorized in the figure.

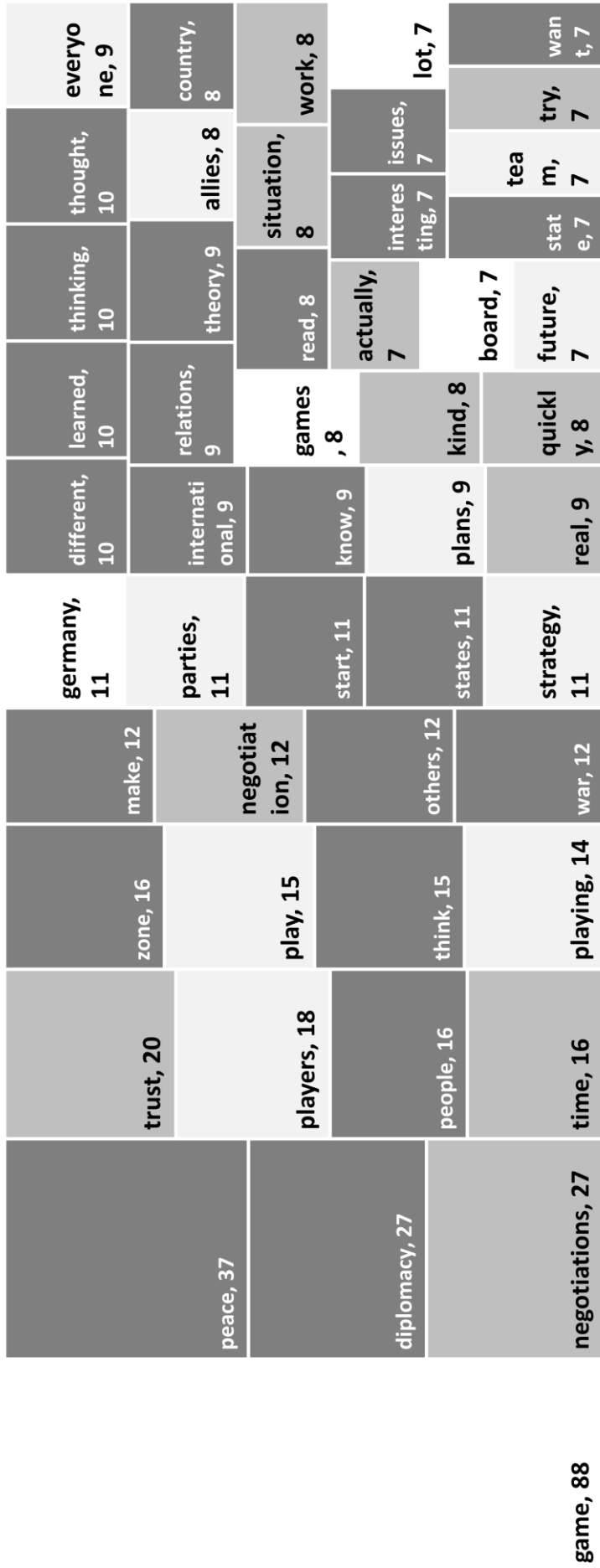


Figure 1. A word mosaic of the qualitative learning diary –data regarding future skills (coded in Atlas.ti). Included are words with at least 7, syntactically (not semantically) identical occurrences in the material. Size of the node thus indicates the relevant prevalence of the term in this list and the number the term’s frequency in the total future skills –quotation material (6831 words). Dark grey: Core foundations, Grey: Transformative competencies, Light grey: Agency, White: ambiguous regarding this categorization, categorized according to the OECD-framework.

Core foundations

The core foundations of the OECD-framework (2019) are *knowledge, skills, and attitudes and values* relevant for navigating uncertain futures. The content analysis of students' reflections revealed that concerning *discipline-specific knowledge*, the course concept had value in encouraging students to:

1) discover connections between theory and practice

For example, students often noted positively in their learning diaries that they got to “apply” and put into practice the theoretical knowledge that they had just acquired through the game constellations. The game made many of the theoretical notions effectively come alive. Vice versa, students were also able to use their game experience to reflect on discipline-specific theories.

19_5: The pre-readings were very educational and playing Diplomacy especially concretized many of the things we had discussed during the course, for example the art of diplomacy, international anarchy and the importance of being careful of how others perceive you.

19_15: Since the theoretical we learned in the session were applied and implemented in a practical way in the game session afterwards, the content was repeated and reinforced straight away. Especially the intersectionality and how everything was linked, as well as how different disciplinaries, as history, economics, politics were combined

2) make creative links to other theories

In their course diaries, several students made links to theories and thinkers not explicitly covered during the course, e.g. in this quote:

19_15: I found the session very interesting because the whole discussion about in which direction we are heading reminded me of Nietzsche and what he said about the 'eternal return'. I believe the question whether we develop as nations and people, learn from our mistakes and become more peaceful is a highly contested one. According to Marx, history is teleological and progressive, so we, as mankind, are actually going somewhere but maybe there's some truth about Nietzsche's idea, too, that people continue repeating the same events over and over again. An analysis of wars and their development can serve as an indicator of whether we're moving back to Hobbesian culture, which would mean constant wars or even increases in the absolute number. However, we have to keep in mind that the total number of wars isn't sufficient since the severity of a conflict and the number of victims are decisive, too.

3) reflect on various aspects of negotiations

Being able to experience the thrill and uncertainties of role-playing a diplomatic negotiator really drove home to many students what negotiations are about, in a way that just reading the same from textbooks may not do.

19_18: To sum up, I think that many things that we talked in the lectures I also experienced in the game which was very nice and helped to really understand diplomacy on another level. ... I noticed in the game how people had quite different perceptions about the game and other players. From the very beginning people made assumption about others which probably affected the end result and the game overall... People also had different negotiation tactics and it seemed that the things

we talked about on the lectures, such as trust, compromises, the will to have an agreement, third parties etc., were important also in the board game negotiations. You could also notice from playing the game how psychological factors and things like groupthink or heuristic fallacies can play a part in negotiations and how things like stress for example can have an effect on people and their decision-making. To conclude, I feel like I learned a lot from the lectures, and it was nice to see how the things that I learned in the lectures can actually affect negotiation situations.

4) reflect on the game's underlying assumptions themselves and their relation both to discipline-specific theory and world politics as such.

The original version of the Diplomacy game often sparks interesting class discussions about the game's rules and its relationship to discipline-specific theory and the real world (Asal, 2005). The modified game rules used in this course concept did not make an exception. As the below quotation shows, a student was able to reflect on these modified rules, linking them both to the rules of other similar strategy games, as well as to political thinkers:

19_12: I genuinely enjoyed the possibility to have multiple winners in a game. Most board games and computer strategy games are based on the notion that there can only be one winner, so as a board game hobbyist this was a breath of fresh air. Due to their single winner nature, strategy games can be considered Hobbesian, or Lockean at best, but never Kantian. In games like these, for example Diplomacy without the course's modified rules, all rules boil down to competition against other players at their core. Even making treaties and deals with other players are just means to an end, and the games are more about knowing when to stab someone in the back at the right time than forming true alliances, as there can only be one

winner. This is most likely comes from strategy games' roots in war games. Games like Risk were the epitome of the Hobbesian ideology of war against all, and would indeed be just about wiping out your opposition. As such rules for diplomacy and alliances were implemented not to allow players to work together, but to move the games towards a Lockean logic of rivalry. The rules are there to add complexity to the game and to allow different strategies, but at their core they are not about simulating real international relationships.

Some of the commentary on game rules in the diaries also reflected the critical attitude of students:

19_1: The result of the game did leave me questioning whether this version of the zone of peace with the rules it had was an accurate representation of the Kantian logic of anarchy, or at the least of its viability as a solution for resolving issues.

When it comes to *epistemic* and *procedural knowledge*, i.e., actually putting the discipline-specific knowledge into practice, the OECD-framework states that in the future individuals need to be able to think and reason like experts in structured, discipline-specific processes as well as simultaneously comprehend multidisciplinary expert viewpoints into a problem or a situation (OECD 2019). In their learning diaries, students reported that the time-pressures of the negotiations really put their expertise into the test, and required them to make educated interpretations of others' actions and negotiate on the basis of these—inevitably incomplete—interpretations, according to the given rules of the game and in line with their personal goals and knowledge. They also reflected on how the different realms of “*history, economics and politics*” (19_15) were interlinked in their problem-solving processes. They often reported experiencing that their understanding of “complex issues” has developed closer

to that of an expert, and have learned important skills that cannot be learned only from books, which also made them more encouraged to orient themselves towards a post-university career in diplomacy.

19_5: Before this course I thought I was too “dumb” to go to work in the field of diplomacy or international affairs in the future, but because of this course I feel I understand a lot more about those things and wouldn’t now think about a career within international relations [sic] as “too difficult” -- The way of strategic thinking we had to do when playing Diplomacy also got stuck in my head. Now I see many current events as some kind of game situations.

When it comes to *core skills*, the OECD-framework states that future citizens need to be able to function socially and emotionally, as well as cognitively and metacognitively, in an environment that is rapidly transforming, e.g., technologically (OECD 2019). The students clearly reflected on the importance of goal-oriented, interpersonal communication skills and the value of relationships for building trust in diplomacy, which was seen as the “*most important commodity in the game*” (19_1). They also acknowledged the importance of emotional self-regulation, as well as critical and creative thinking for the adaptive problem-solving related to the game, for instance, that sometimes one even “*has to use their acting skills and be in some kind of a ‘role’ to get one’s message through*” (19_5).

19_14: Fast we all learned that it’s a game that’s played and won purely in a social way. --This course teaches you how to deal and get along with other people and you have to get out of your comfort zone and you evolve your negotiations [sic] skills. And makes you learn what is the best way to approach people when you want something in exchange for something from them.

As for *attitudes and values*, in addition to establishing the social background of the above-mentioned most important human commodity, trust, the game enabled some of the players to enact their own, pre-existing personal morals and deeply held values, in the form of the negotiated peace treaty. Some mentioned that they were in fact drawn to the course only after they had heard about the modified rules and the possibility of alternative victory conditions to the traditional way of playing Diplomacy. This is also reflected in the Figure 1 relative frequencies of the words “*peace*” (37) and “*war*” (12), which might have turned out differently without the altered win conditions (Mattlin 2018).

19_1: On a personal level I don't enjoy betraying others even in a game setting so I was therefore excited to learn about the new victory conditions that added depth to the negotiations by making both trust and betrayal real options to choose from.

Transformative competencies

The so-called transformative competencies of the OECD-framework comprise of three aspects important for being able to “shape” the collectively desirable future: *creating new value, reconciling tensions and dilemmas*, as well as *taking responsibility*. While the role of reconciling tensions and dilemmas is self-evident in the context of IR, in spite of individual exceptions, students commended the opportunity of being able to take the related theory into practice with the implementation of the game. There were also reports of the weight of responsibility, on the students’ shoulders as they tried to navigate the quickly evolving horizon of potential futures shaped by their actions in this simulated environment towards the best possible outcome.

19_4: It all comes down to trust, and there was very little of it, if any. I only got all the demands met the day we had our last game session (5th of November) and I only got everyone to agree maybe a few minutes before the class started. I can only

image the nerves a real peace negotiator has to have, because my day was just an absolute mess. I did not take my eyes off my phone for a second. Getting everyone on the same page and to agree on minor details (some made absolutely no sense) was very stressing. I am glad we reached the zone of peace though, and I do feel like I was a major player in getting us there—

Agency in anticipation, action and reflection

As the ultimate goal of acquiring future skills, the OECD-framework defines agency as the ability and will to influence one's own life and the world around oneself for the better. One needs to be able to learn, independently, as well as in mutually beneficial relationships with one's friends, family, teachers and the community at large, so-called "co-agency" (OECD 2019). During the course, students co-dependently enacted, face-to-face and virtually in their social networking applications, a simulation consisting of multiple cycles of action, anticipation and reflection (OECD 2019). Thus, it established experientially the trust and diplomatic structures behind currently well-established political institutions shaped in the course of actual history and enabled students to engage in meaningful co-agency. Some, however, learned this lesson the harder way:

19_7: It was quite difficult to try to argue for our case when the council room was full of people that were decidedly against us, and Italy was unwilling to leave the room to negotiate with us, no doubt as a sign of solidarity for their new allies. -- In the end, not every hobbit is like Bilbo or Frodo Baggins, as most of the hobbit kind greatly prefers a life of leisure and minding their own business, taking it easy without succumbing to toil and suffering. -- In any case, we are currently living in an era that is going to experience many changes unheard of in human history, and along those changes we are going to need people who can keep a cool head and

try to use their negotiation skills to keep humanity somewhat under control. I believe that this course has helped me with that area immensely, meaning that I now see much clearer what I want to do in the future.

Table 2. Central findings of the qualitative content analysis related abductively to the categories of future skills by OECD (2019).

Area of Future Skills	How this is visible in the data	Related quotations
I Core foundations	<p>Knowledge</p> <p>Disciplinary: creative links between theory and practice and to other theories, theoretical aspects of negotiations, the game’s underlying assumptions and their relation both to discipline-specific theory and world politics as such</p> <p>Epistemic: how IR experts reason and make decisions under time pressure</p> <p>Procedural: rules of the game simulating how negotiation processes happen under practical pressure</p> <p>Interdisciplinary: topics of history, economics & politics fusing in reasoning</p>	<p><i>18_5: I have always perceived diplomacy as material that is not being applied or I didn’t had the chance to apply it before, but when we took the class and found out that there is a game — Moreover, all the lectures were like a link base for the diplomacy game, because after the first session, I always relate the actions and steps in the game to what we learned.</i></p> <p><i>19_6: Even if we wanted to play the game as neatly as we would like, not collecting any grievances and taking anyone’s elses land to as ourselves, it was hard to stay with just one clearly pictured plan in mind, since there was multiple players and we quickly saw our resources becoming lesser compared to them.</i></p> <p><i>19_6: This to me was in a sense essential to what game theory sees as "configuration of desires and beliefs", that we both told our opinions in different matters relating to other countries. Game theory has an assumption, that the outcomes of interaction stem from these configurations.</i></p>
	<p>Skills</p> <p>Social and emotional: building trust through goal-oriented interpersonal communication and relationships</p> <p>Cognitive & metacognitive: self-regulation in interaction, adaptive problem solving through critical & creative thinking, reflection on made decisions</p> <p>Practical & physical: basis for computationally understanding IR</p>	<p><i>19_16: -- and it also actually taught me quite a lot and also improved my negotiation and communication skills. By playing the game I learned how important it’s that you have at least some kind of plan or tactic when you start the negotiations but that you also have to be flexible and prepared to make compromises.</i></p> <p><i>19_4: First, if I ever were so lucky as to serve as a peace negotiator for an important peace deal, I would not act how I acted during the game of diplomacy. At least I wouldn’t lie. But I would figure out whether or not the people or states I’m working with are trustworthy.</i></p>

II Transformative competencies

Attitudes & values	<p>Enacting pre-existing personal morals</p> <p>Establishing background of ultimately human values and moral code (as Kantian game winning condition)</p>	<p><i>19_2: I am a staunch pacifist, and I wanted the online discussions and the Diplomacy game to reflect that.</i></p> <p><i>19_6: How is an idealist visual angle turned into pragmatism? How does a regime seem to resonate with many problems of today, be it corruption, sustainable consumption, global trade, or everyday politics that concerns people's values.</i></p>
Creating new value	<p>Through simulation constructing value of trust as social capital in an individual mind</p>	<p><i>19_1: Very quickly we recognized the most important commodity in the game: trust. We therefore abstained from outright lies in order to build the other players' trust in our word.</i></p>
Reconciling tensions & dilemmas	<p>On discipline-specific level</p> <p>In practice</p>	<p><i>19_4: Prenegotiations play a big part in negotiation process and work needs to be put in even before the parties get to the table. I found this pretty fitting as this has come to play in the game of diplomacy as well, there are conditions for joining an alliance and the conditions need to be met before you get an invitation to join in.</i></p> <p><i>18_5: Also when I participated in the game, I learned how it is complicated to make a diplomatic negotiation with other countries and how much process and negotiations it needs. And absolutely, the decision making process under circumstances of uncertainty and time pressure needs a tact and strategy.</i></p>
Taking responsibility	<p>Preparing for real world responsibility through experiencing the stress of moral reasoning under simulated, high stakes conditions.</p> <p>Learning from mistakes (Germany as an individual aggressor).</p>	<p><i>19_5: I was really stressed because we were kind of allied to Germany, but Austria-Hungary was our closest ally from the beginning. Would it be morally okay to go to the zone of peace, even though it would leave Germany all alone (at this time all the other countries were also interested in the zone of peace).</i></p> <p><i>19_16: -- Pressure resilience is put to the test when negotiating high stakes issues.</i></p>
III Student agency	<p>Committing to established political structures through experiencing their simulated procedural background</p> <p>Co-agency through a shared simulation</p> <p>Learning from simulated failure</p>	<p><i>19_5: It was very interesting to hear other players strategies and hearing how people perceived each other was very educational in the light of the themes we had discussed throughout the course.</i></p> <p><i>19_7: There was also the thing about absolute power corrupting absolutely, and if I would fail, I would have only myself to blame. Thankfully I was assigned a new team member just before the start of the game. Two heads work faster and better than one, after all.</i></p>

IV Anticipation—	The whole game as a series of simulated IR-relevant cycles of anticipation, action and reflection.
action—reflection -cycle	Closely resembles the design principles for constructivist gaming learning environments of Rosario & Widmeyer (2009)

Discussion

We set out to examine the use of an alternative, gamified approach to teaching international relations at the university level and how it might support the students in developing important, broad-based knowledge and skills with regards to their integration to the rapidly digitalizing future working life. As the results suggest, the gamified IR course concept managed to support the accumulation in students' discipline-specific concept knowledge, as quantified by the conceptual pre- and post-test setting. The learning diaries further revealed that the increase in discipline-specific conceptual understanding was most apparent in how students were able to apply theoretical insights into game situations and negotiations; how they creatively made linkages to theories not explicitly covered on the course; how they reflected on the art of negotiation, both in theory and in practice; as well as on the assumptions underlying the theory-based win conditions of the game in relation to real world events (Asal 2005; Rittinger 2018).

While Diplomacy is frequently used in IR teaching, it has tended to be used mainly to illustrate Realism, or to allow students to ponder and challenge Realism (Asal 2005; Rittinger 2018). This has also frequently been perceived as a problem and limitation in the pedagogical utilisation of the game (Mattlin 2018), as the original game underlines, even encourages, values and behaviours that are not conducive to the kinds of future skills that the OECD and other organizations call for (e.g. cooperation and collaborative problem-solving). This paper has discussed a pedagogically developed version of the game (Mattlin forthcoming). The data from students' learning diaries (see Figure 1) suggest that the teaching concept can overcome the limitations of the original game. Collaborative and constructive words (e.g. *diplomacy, negotiation/s, peace, relations, international, everyone, team, trust, allies*) are far more prominent in the learning diaries than destructive words. It is striking that

words such as *attack*, *betrayal*, *backstab*, *enemy* or *distrust*, with which the game is often associated (Eskin 2004), are almost absent from the learning diaries. It is increasingly imperative that the governmental and legal interventions to adapt to our increasingly digitalized and automated future (Messner et al. 2019; OECD 2018) are computationally aligned with the theories and best, practical normative structures established in the research tradition of political science. This is why it is also important that the students get to actually experience these theories in practice and computationally establish world peace within the game, reflected in this novel, Kantian win-condition of the game.

In addition to the discipline-specific concepts, the applied dimension of the game effectively supported the development of many important skills regarding students' future-readiness, e.g. discipline-specific epistemic and procedural knowledge (Hudson and Day 2019; Loggins 2009; OECD 2019), as well as the application of discipline-specific and interdisciplinary reasoning and decision-making both within the game and beyond (Gick and Holyoak 1983). The time pressure experienced in the simulated conditions also simulated the emotional weight of responsibility on actual diplomats' shoulders while making moral decisions, which the students experienced as stressing but also improving their self-efficacy of working in the field in the future (Bandura et al., 1997). Through the social aspects of the game, students reflected on the importance of good social and emotional skills and intentional self-expression for working towards a common objective. Their pre-existing attitudes and values were fulfilled as well as (re)constructed in an experimental manner through the game with the altered win conditions for peaceful outcomes (Mattlin 2018). Although there were also indications of the "gaming the game" –phenomenon in this sample with some students (the team playing Germany attracting attention, see Figure 1) role-playing more aggressively than they probably otherwise would exhibit in social relations (Frank 2012; Hidi and Anderson 1986; Sundararajan and Adesope 2020), the game, in most cases, managed to support participants' discipline-specific conceptual as well as procedural knowledge in the desired direction. The whole game also acted as a series of simulated, IR-relevant cycles of anticipation, action and reflection

(OECD 2019), and in this respect, it closely complied with the ideal design principles for constructivist gaming learning environments of Rosario and Widmeyer (2009).

One area of future skills in which the board game did not, at first hand, seem to develop the students was that of digital skills. However, an important area of 21st century digital competence (OECD 2019) are also the skills of computational thinking, which are the intellectual, unplugged counterpart of computer programming capability (Wing 2006; Drake and Sung 2011). Computational thinking enables the abstract formalization and automation of concepts as algorithms for the implementation of new digital products and services, which were also distinguished as increasingly prevalent tasks in the future working life (OECD 2018). Some students mentioned viewing current real political events as sort of “game situations” as a result of the game, which would imply that the simulation enabled these political science students to also computationally and systemically conceptualize their discipline-specific theory to some extent while playing it out. This might prove an asset in the future in the potential implementation of novel digital utilities such as that suggested by Honkela (2017) who outlined an AI “Peace Machine”, a socioemotionally sensitive translator for, in particular, international diplomatic negotiations (Hämäläinen and Honkela 2019; Messner et al. 2019). Already today, novel machine learning text analysis methods of social media are being used in the forecasting of political phenomena globally (Schrodt 2011), and these could certainly benefit from even stronger theoretical alignment.

Methodological limitations and suggestions

Some methodological limitations and suggestions for improvement should be noted regarding the current research, which, as mentioned, was conducted as a plausibility probe prior to potential larger investigations (i.e. Eckstein 2000). First, the sample of the study was limited in size (due to restrictions in the game implementation) and was focused on one academic discipline, constraining the generalizability of the results overall and beyond the subject matter of IR. However, we used two

student samples from different universities to improve the validity. Second, the concept definition task in the pre- and post-test has only limited capability of capturing the potential change in discipline-specific knowledge, although this information was based on objective evaluation and was supplemented by the self-reported data from learning diaries. In the future, we can easily expand on these results to create a conceptual test measure to gauge the essential conceptual change from naïve to more theoretically sophisticated views in a larger sample. The naturally occurring (i.e. not separately requested) and more comprehensive reflections in the learning diaries also shed more light on the in-depth understanding of conceptual knowledge and skills developed. Naturally, the participants might not personally recognize all of the understanding and skills implicitly developed during the course, but the large number of heterogeneous informants and data from multiple points in time enables better conclusions in this regard.

Regarding the reliability of the results of this sort of qualitative analysis, the impact of researcher personal bias was overcome by including three neutral evaluators in the analysis of the data, only one of whom is pivotal to the course pedagogy, as well as utilizing an outside analysis framework with solid research basis. Although novel, promising textual data mining techniques were not suitable for this particular material (i.e. Silge and Robinson 2017), quantifying the by-word frequencies (Figure 1) also provided one way to objectify the analysis. The OECD-framework as well as these new, discipline-specific insights could also be utilized in the creation of a Likert-questionnaire to collect a statistically more powerful sample in future investigations. Including the informants themselves in the evaluation of the established results would have further increased the reliability of conclusions, but due to the aim of minimal invasiveness of the research on the students, this was not implemented.

Third, since we did not have a comparison group (experimental research design), we cannot make inferences on how the gamified implementation impacted the results (if at all) compared to a more traditional pedagogical course implementation. However, there is always a trade-off in trying

to maximize an optimal learning experience equally for all students simultaneously with scientific rigor, and the current, minimally obtrusive and equal course implementation was advantageous in this regard. Utilizing a comparison group as well as the more structured quantitative measures regarding different future skills could further enhance the research design in the future. Finally, the current study did not investigate the long-term effects of the course or whether the changes in broad-based competencies and future skills would manifest in students' actual behaviour. A follow-up measure on the students could be used in the future to overcome this limitation.

Conclusions

To conclude, this innovative international relations course concept, built around the Diplomacy – board game (Mattlin 2018), managed to support discipline-specific learning as well as the future skills of the students. The game seemed to provide a meaningful context for the students to apply their theoretical mental models and thus better supported the deep level transfer of this knowledge base into analytical expert perception (Marton and Säljö 1976; Scardamalia and Bereiter 2014; Gick and Holyoak 1983; Bereiter and Scardamalia 2003; Vosniadou 2009; Hidi et al. 2004). However, in order to further improve the course concept and to enhance the adoption of theoretical material, it might be necessary to more actively instruct the students to make theoretical connections specifically when the theoretical material is almost entirely new to the players. A meaningful way to do this might be to better channel the excitement about the game to the online discussions, as these discussions have previously occasionally been somewhat performatory in nature. Also, the pedagogically enhanced win-conditions could even better mirror the different theoretical alternatives, an issue discussed more extensively in Mattlin (forthcoming), as going beyond more traditional Realist interactions and outcomes in practice requires better understanding of how to computationally formalize the more utopian, peaceful alternatives (Messner et al. 2019).

In the context of higher education, it is important to offer study options that reflect the actual knowledge practices engaging the concurrent generation of students in their lives in general (Kruskopf, Hakkarainen, Li and Lonka 2020). Discipline-specific knowledge from the current field as such is naturally important for building a sustainable, increasingly digital Anthropocene (Messner et al. 2019). However, traditionally cramming all the information from theory textbooks does not necessarily qualify one for the practical and multifaceted work of a modern diplomat, requiring high levels of social intelligence as well as, increasingly, also creative and original innovations making use of deep-level disciplinary expertise (OECD 2018; Sawyer 2011). Thus, implementing also simulative, including board game solutions in higher education is very much feasible and recommended, as demonstrated by this study. The course feedback clearly shows that students are very excited about the course concept and highly appreciate both the game and the varied teaching methods employed. For many students, the course is a unique experience in itself (Mattlin 2018) providing them with an activating and engaging learning environment (Lonka and Ketonen 2012; Csikszentmihalyi 1996) that better enhances not only their discipline-specific theoretical understanding but also skills regarded important for their future integration to the radically changing playing field of our planet Earth, and beyond.

Ethics approval

This is a study based on the written informed consent of subjects who are over 18 and to whom the research design poses no harms or threats. The Finnish National Board on Research Integrity has stated that no formal ethical approval is required for research that adheres to the tenets of the Helsinki Declaration, as this research does.

Availability of data and material

The anonymized data and materials used are available by request to the authors 10 years from their collection.

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Authors' bio

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Elina E. Ketonen is postdoctoral researcher in educational psychology at University of Helsinki, specialized in advanced statistical methods. She has used cross-sectional, longitudinal, experience sampling and psychophysiological datasets in her research and several statistical methods, such as variable- and person-oriented approaches, multilevel modelling and most recently, intraindividual analyses. On 2019 she spent 4 months in University of Oxford to specialize in analyzing nested experience sampling and psychophysiological datasets and to take advanced statistical courses on Rasch, Bayesian and multilevel modelling. Elina is interested in investigating the relationships between academic emotions, student motivation, learning, and well-being. More specifically, she is interested in exploring what makes people invest their time in studying and what factors predict learning and achievement. She is also interested in how to develop learning environments that foster positive emotions, engagement, and active learning, where enjoyment of learning is enhanced and potential negative emotions are utilized in a productive way.

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