

Scimification

Holistic Competence Scenario Development and the Example of Virtual Intercultural Escape Rooms and Strategy Games¹

Jürgen Bolten

Abstract *Scimification is a newly constructed word composed from the words science and gamification. In terms of content, it describes a realized form of the reciprocal connection between the competence levels of knowledge (cognitive level), ability (conative level) and will (affective level) in digital and virtual university teaching. The question of whether, and if so, how, science and gamification fit together, arises with urgency against the backdrop of the corona-accelerated digitalization movement in higher educational teaching: Should games such as virtual strategy games be taken seriously at all in academic training and further education? Conversely, against the background of significantly changed teaching/learning scenarios, the question arises as to whether cognitive teaching/learning formats, such as 90-minute lectures, remain suitable for the initiation and maintenance of sustainable learning. Using the example of interdisciplinary and transnational university cooperation, this chapter outlines how virtual escape rooms and strategy games can contribute to the promotion of holistic competence development processes. They may also stimulate new curricular directions for the methodology-based didactic implementation of digitalization and internationalization.*

Keywords *Scimification; Gamification; Virtual Escape Rooms; Digitalization; Internationalization*

¹ This chapter is based on a paper given by Jürgen Bolten at the ReDICO E-Co-Conference “Lifewide Learning: Transformations and New Connections in Postdigital Societies”, held at the Dornburger Castles, Jena, on 1 July 2022. It was translated from German into English by Fergal Lenahan.

1. Corona and its Consequences: A 'New Normal' for Teaching and Learning Scenarios?

Since the spring of 2020 continuous speculation has reigned, from a wide variety of perspectives and in relation to various facets of life, as to what features may constitute the 'new normal' following the Corona pandemic (see e.g. Minkmar, 2021). What is common to most forecasts and visions of the future is their provisional sense: Are reliable statements on long-term structural developments possible at all in such a volatile 'between-stage' of 'finished' but, yet 'not quite finished' pandemic?

Precisely for this reason the search for a 'new normal' is a central and at the same time a paradoxical issue; an expression of a longing for clarity, for clear rules, a sense of constancy and consistent explanatory power – knowing full well that the 'new' quality of normality will consist of an unquestionable increase in uncertainty and ambiguity, not only technological but also ecological. In this sense, 'normality' represents actually the 'not-normal' (from a contemporary perspective) and an 'uncertainty' which is disruptively generated and whose structures are fragile, fuzzy and tend to retain a limited and temporary validity.

In other words: In the interplay between structure and process, i.e. between culturality as unquestioned "relevance", "plausibility" and rule-formation (e.g. Schütz & Luckmann, 1991) and inter-culturality as the uncertain, the unfamiliar and the fluid (Kron & Weihrauch, 2021), the balance of power seems to have shifted towards the processual and the uncertain, in the sense of what is currently often referred to via the acronym VUCA (volatility, uncertainty, complexity and ambiguity) (Abidi & Joshi, 2015).²

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- 2 With the further acceleration of global technological, ecological, and economic dynamics of change, the more present and relevant the "inter-cultural" will become as a primary experience of uncertainty in familiar contexts characterized by culturality: Global and local, culturality and interculturality will increasingly lose the sharpness of their demarcation and instead represent a dynamic and ambiguous context of reference. Intercultural competence is thus expanding into a "VUCA competence", which still references classic experiences of uncertainty, for example in international assignments in which normalcy, plausibility and relevance are largely unrecognizable thus making routine action not clearly possible. However, due to the increased disruptive experiences of uncertainty – resulting from the consequences of climate change, pandemics, and the future failure of digital global networks – such a predominant deficit of culturality structures will increasingly gain prominence in culturally-familiar fields

In higher educational institutions, which remain the primary focus of this chapter, the departure from the ‘old’ structures of normality with the onset of the pandemic was at least not entirely unprepared for, as both digitalization and internationalization had already been a “core task of higher education development” (HRK, 2015) in Germany for several years. Although digitalization and internationalization represent a central component of – most – higher educational institutions’ target and performance agreements with the respective federal states in Germany³, many of the strategies were not ready for practical application at the time of the complete suspension of face-to-face third-level teaching in March 2020.

According to a study by the Stifterverband für Deutsche Wissenschaft – a non-profit registered association which looks to connect the fields of education, science and entrepreneurial innovation⁴ – in the winter semester 2019/20, according to the university teachers surveyed, just 12 % of the courses were digitally available, whereas “since the beginning of the pandemic, the proportion increased to 91 %”⁵ (Winde et al., 2020, p. 2; see also Buchholz et al., 2020 and Besa et al., 2021). This adjustment usually took place within 30 days, sometimes even faster (Winde et al., 2020, p. 2).

Accordingly, what has often been experienced as “forced digitalization by Covid 19” (Sonnleitner 2021, p. 183) has, on the other hand, given not only digitalization but also, indirectly, internationalization efforts at universities an enormous and unexpected developmental boost:

The abrupt rethinking and reorganization, especially with regard to teaching [...] allowed virtual forms of internationalization to become, within a very short time, in many cases the only way to maintain international connections, to allow international students to continue to participate in the university life of the host institution and to offer international experience to German students. (Bendenlier & Bruhn-Zaß, 2021, p. 11)

of agency. This will make, therefore, intercultural competence especially necessary and relevant, and in an expanded sense (see: Bolten 2017 and Bolten/Berhault 2018).

- 3 In the case of third-party funded project applications, the existence of clearly formulated internationalization and digitalization goals have increasingly become prerequisites for the successful awarding of funding.
- 4 More than 11,000 students and 1,800 teachers took part in the survey, which was conducted by the Stifterverband in association with McKinsey & Company, Inc.
- 5 All translations by Fergal Lenehan.

The “virtual internationalization” (Bendenlier & Bruhn-Zaß, 2021, p. 9) as well as the short-term conversion of teaching to digital formats required (and still requires) a large degree of willingness to improvise on the part of all involved. Schaller (2021, p. 30) formulates how this is seen from the perspective of students:

Face-to-face classes suddenly become digital lectures, journeys to the university and the walking distances between lectures are no longer necessary, group work or preparation for presentations in the form of joint meetings require new organizational ideas. The measures of the Corona pandemic, thus, not only have an effect on their learning and organizational behaviour, but also on their social life. Common breaks with fellow students, the morning coffee in the cafeteria, the chat in between – none of this takes place as usual anymore.

The recommendation, arising from this, for students is to “restructure their day and define new (digital) processes for their mode of work” (Schaller, 2021, p. 30), and is ultimately a plea to take the construction of a ‘new normality’ into their own hands. What ultimately must be structured individually and very differently with regard to the framework conditions of learning@home (time and media management, social contacts, adaptation to exercise and nutrition, etc.), also has an effect on satisfaction levels with one’s own learning experience.

According to the Stifterverband survey, this dropped from 85 % in the winter semester of 2019/20 to 51 % in the first Corona summer semester of 2020: “Reasons for this include a lack of social life among students, problems with motivation and concentration when learning from home, and insufficient opportunities for exchange with teachers” (Winde et al., 2020, p. 4).

Accordingly, teachers were challenged not only professionally but also didactically to transform (or redesign) their content from face-to-face to online formats in as short a time as possible, as well as ensuring that motivation was encouraged, concentration maintained, and personal contacts continued to somehow be initiated. This is a task that should not be underestimated, especially since, according to the survey cited above – although with a clearly decreasing tendency – “one in four teachers view digital formats negatively” (Winde et al., 2020, p. 7).

Since, at the commencement of the pandemic, digitalization activities in the field of higher education had begun – more or less intensively – but had

not yet reached the status of normality, a digitalization 'culture' with sufficient practical experience and conventionalized rules of action had not yet been established. The aforementioned 'digitalization compulsion' was therefore premature from a developmental perspective and triggered uncertainties and negative effects that would probably not have occurred – to this extent anyway at least – if the cultural change had taken place without disruption.

Due to the pressure of having to co-constitute a 'new normality', digitalization initiatives have often created a paradoxical situation – because they have been implemented 'too quickly' for many actors, they have led to a complexity-related loss of motivation⁶ and to concentration weaknesses⁷. In short, this situation has contributed to a situation of indeterminacy, which, in view of the still unpredictable duration of the festering pandemic, apparently cannot be overcome in any other way than through digitalization.

It seems clear that the measures themselves will have to change. What will emerge as the 'new normal' in the field of digitalization requires a long-term and continuous negotiation process between technology development and user acceptance. How such a process will proceed, what will be developed, accepted, and further developed and what will not, can only be vaguely

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- 6 Loss of motivation results, among other things, from the 'too much and too fast' of the digitalization process, e.g., from the high innovation dynamics of software development (the necessity of permanently learning about the use of new 'tools'), to the lack of clarity as to what should exactly be learned and in what way.
 - 7 Causes of the concentration deficits lamented in the Stifterverband study result from multimedia practices: The smartphone, which is available to secure technical connections via the PC or as a supplement to them (e.g., when using voting tools), tempts people to engage in parallel social media activities, for example. This further increases the already multi-channel perception requirements: the 'old' all-in-one perception of face-to-face teaching is now distributed across channels such as audio, visualizations on the split screen, video segments, one's own webcam, chat functions and possibly even subtitles. In addition, there may be specific perception requirements of the home office environment, such as children requiring certain things, flat mates in the adjoining room or, indeed, curious pets.

predicted.⁸ This leads to consciously experimental and sometimes improvisational behaviour within the very process itself.

A case in point from the context of digitalization is the lack of response to MOOCs imported from the USA at the beginning of the 2010s in the higher education sector: Massive Open Online Contents (MOOCs) use new technological possibilities with which, for example, lectures could be placed online and distributed worldwide. This process was linked to business models that sought to improve the income levels of universities. Less relevant were reflections upon higher educational pedagogy and as to whether, for example, face-to-face lecture formats with a duration of up to 90 minutes, and without further learning support, would be accepted at all. MOOCs were ultimately not widely accepted (Beck, 2015) because they were not relationally conceived as components of a complex system within a variety of connectivity options and were, accordingly, rejected by the face-to-face teaching system, which was still clearly dominant at this time.

As a reaction to this, experiments were conducted with “MOOC games” (Tan, 2013) in an attempt to establish a relationship with possible target groups in a playful and effective way and in an attempt to situate MOOCs within existing learning cultures. Another variant with similar objectives is to be seen with Collaborative Online International Learning (COIL):

In contrast to MOOCs (Massive Open Online Courses), smaller teams usually cooperate with each other in COIL formats in time-limited, closed, seminar-like structures. The students have to meet several requirements in the process: They organize themselves in university-mixed teams, solve tasks together in synchronous and asynchronous settings and in this way produce performance records. (Schillig & Girschik, 2021, p. 61)

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- 8 Tools such as Miro, wonder.me or video conferencing systems such as Zoom, which are now widespread in university teaching and also standard in the context of negotiation processes for data protection guidelines, were largely unknown before the pandemic, but these tools will play a central role, with decisions to be made as to which further technological developments are oriented towards them, with certain adaptations. In this way, dynamic networks with specific digitalization cultures emerge – with quasi-guidance by the ‘invisible hand’.

2. Affective Access, Conative Collaboration Scenarios and Cognitive Anchoring: The Holistic Orientation of the Scimification-Approach

As this attempt in relation to MOOCs has not led to the desired success, at least in the German MOOC scenario⁹, it suggests that a playful approach does not *per se* also lead to the intended effect of attracting and retaining learners for learning subjects.

Controversies surrounding the meaning and benefits of including playful elements within learning processes – which have of course been undertaken since the earliest days of school pedagogy – in a digital context occupy the entire spectrum of reactions, between vehement rejection and enthusiastic advocacy. Thus, on the one hand, the danger of “losing sight of the seriousness of learning and academic activity and losing oneself as an educational institution in the shallow waters of the fun society” (Martens, 2009, p. 39) is emphasized, while, on the other hand, extremely enthusiastic reports on the successes of edutainment measures¹⁰ are also to be seen (see e.g. Gris & Bengtson, 2021).

Empirical studies on the advantages and disadvantages of the use of games and gamification and the practice of game-based learning (GBL)¹¹ are indeed numerous, but also have not been able to clearly resolve this controversy, as recent meta-analytical comparisons show: Hoblitz (2015) summarizes that game-based learning slightly increases motivation in the classroom, but hardly improves learning effectiveness.

9 As far as can be observed, there are still no empirical studies on the success or otherwise of the MOOC game strategy. In Germany, since the end of the MOOC hype in the mid-2010s, there has been a “relatively high degree of scepticism”, as the study from the project “MOOCs After the Gold Rush” summarizes (Hüther et al. 2020, p. 70). According to the study, “none of the universities interviewed in Germany [...] plans to offer mini-courses of study or full courses of study as MOOCs” (Hüther et al. 2020, p. 70).

10 Edutainment is a newly invented word mixing ‘education’ and ‘entertainment’.

11 Games may be embedded in learning processes, but basically exist independently of them. In gamification, game elements or playful tools (e.g., virtual reality glasses, virtual escape rooms or quiz formats, such as Kahoot) are integrated into contexts that are initially not game-based, such as conventional teaching/learning processes, while game-based learning makes playfulness the basis of the learning process. These include, for example, serious games. On the typology of the different game perspectives, see also Jaeger (2015).

Schaumburg (2018, p. 29f) comes to similar conclusions in her meta-analytical comparison: The effects of games on learning are positive, but the effect size is rather low. Important, however, is her (Schaumburg, 2018, p. 36) argument that “the learning effectiveness depends decisively on the reflection of one’s own procedure in the handling of game scenarios”, and that above all the way in which the game elements are didactically embedded is “decisive for the learning effectiveness” (Schaumburg, 2018, p. 37). When assessing the effectiveness under relational aspects, the question thus is not so much how good or bad a game or gaming element is, but to what extent is it suitable to be didactically implemented, and to what extent is this actually realized in the concrete individual case.

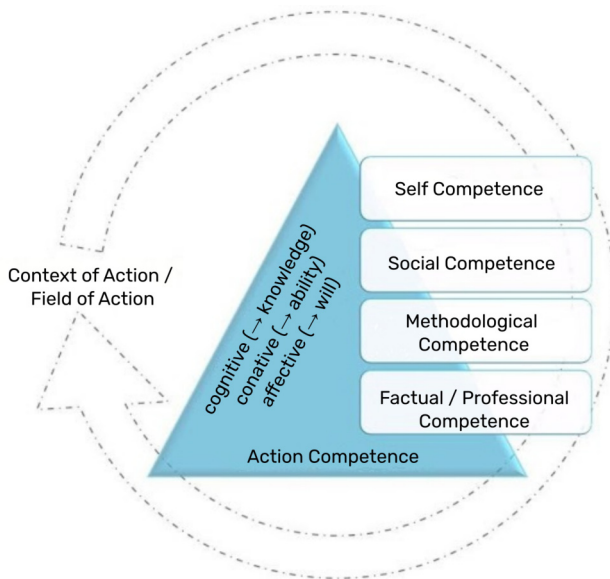
Competency models provide an orientation for the assessment of didactically successful implementations.¹² Even if the current structuring of the concept of competence varies greatly, competence concepts generally use grids that refer more or less explicitly to Heinrich Roth and/or Franz E. Weinert. In his *Pädagogische Anthropologie* (Pedagogical Anthropology) (1971) Roth divided the areas of competence into subject competence, social competence, and self-competence, which – supplemented by methodological competence in later discussions – still represents an important orientation framework for the development of education plans. This “broad concept of competence” (Detjen et al., 2012, p. 19), which clearly goes beyond the transfer of “information knowledge” (Erpenbeck & Sauter, 2016, p. 49), has been expanded in the context of the Pisa discussions.

According to Weinert (2001, p. 27f), competences describe the “cognitive abilities and skills available to or learnable by individuals to solve certain problems as well as the associated motivational, volitional and social readiness and abilities to use the problem solutions successfully and responsibly in variable situations.” From Weinert’s perspective, the interaction of cognitive competences and motivational orientations is constant for action competence. The functional aspect (‘knowing, wanting, acting’) that is also considered here has been anchored in educational policy across the board following the so-called Klieme expert report (2003) *Zur Entwicklung nationaler Bildungsstandards* (On the Development of National Educational Standards). Even if there are sensitivities within the competence discourse that do not seem to be necessarily conducive to an integration of the Roth and Weinert traditions (see e.g. Erpenbeck

12 Compare also Bolten (2016a) on the concept of competence.

& Sauter, 2016, p. 74), a combination of both areas is likely to be expedient. Interfaces with intercultural competence research are obvious, although these tend to refer to cognitive, affective, and conative attitudinal components (Eppenstein et al., 2015; Bolten, 2016; Bolten 2020a). These interrelationships are more clearly shown in Figure 1:

Fig. 1: Action Competence: Structural Features and Contextualization



(Jürgen Bolten's representation, recreated by Carmen Pereyra)

With regard to the effectiveness of the digital tools used, it may be concluded that this is dependent on the degree of holistic tool implementation regarding their interconnection with the competence levels – in the sense of the meaning of the etymological origin of 'competence', namely from the Latin verb *competere*: to bring together. If the didactic implementation succeeds in the sense of such an interconnection of the affective, conative and cognitive competence levels, there is the chance of a high learning effectiveness through the fact that "competence development takes place as a circular movement" (Er-

penbeck & Sauter, 2016, p. 112), or better still in the sense of a spiral movement with its own dynamics.

In the theoretical positioning of recent competence discourses, the importance of the holistic aspect is beyond question: It is a matter of eliminating the “separation between the cognitive realm and the motivational realm” and modelling practical measures with which “motivational and affective aspects can be included as determinants of learning success” (Münzer, 2012, p. 3).¹³ Appropriately holistic approaches take into account the ever more extensive networking of learning processes due to digitalization. For competence research, however, the stronger consideration of the interconnectedness and the non-linear character of its subject area also presupposes the willingness to review its own concept of science:

Thinking in networks is another way of thinking. At least in the Western world, networks and systems are broken down into parts in order to deal with them individually. The concept of science emerged from this reductionist view: The word ‘science’ is derived from the Indo-Germanic root ‘skei-’, which means ‘separation’ or ‘sepe-ration’. Problems are broken down into parts in order to be able to deal with them better [...] and the holistic view is excluded. (Zenk & Behrend, 2010, p. 212)

However, a holistic understanding of ‘science’ must not mean an undifferentiated holism, but one in which the analytical depth of ‘modern science’ is preserved in its diversity and this diversity itself enables cohesive dynamics. The impetus here is the affective, which “with all its underlying directions of force”, is the movement towards “charging action with energy” (Dahms, 2019, p. 15).

As shown, the strength of the affective aspect also remains dependent on a holistic perspective. This is less of an issue when game-based learning elements are regarded merely as supplementary, as is often the case in schools when games are used in substitute lessons. In higher education, the acceptance of the inclusion of game elements has been gradually increasing – but still rather remains on the level of a ‘nice-to-have’, which at least does no harm:

13 However, the idea of a holistic understanding of competence associated with this does not correspond to practice. In practice, according to the critical view of current PISA and Bologna implementations, “the mighty and powerful knowledge transfer and assessment system continues to be granted dominance via distancing diagnosis and evaluation” (Erpenbeck & Sauter, 2012, p. 22).

“Even in the classic forms of teaching, be it lecture, seminar, exercise or practical course, a loosening up through game aspects can certainly not be a disadvantage” (Martens, 2009, p. 45).

In digital contexts, the same is true for gamification applications: Learning progress indicators, quizzes, opinion polls, digital ‘energisers’, etc. have become increasingly popular because, for example in the case of a high-content complexity of teaching, they create a free space for short-term diversion and relaxation and – depending on the tool – promote social relationships. At the same time, they are criticized for their extrinsic and merely situational motivational effect (Conway, 2014).

However, the criticism basically concerns not the gamification tools themselves rather than their lack of didactic integration (Kerres, 2018): Thus, even if they are used selectively, playful elements can serve as motivational ‘door openers’. It is important, however, to indeed keep the door open – for example, by ensuring that gamification elements do not only serve to ‘loosen up’ the teaching situation but are given defined functions within the content development of a learning process.

With such a step, playfulness no longer proves to be a separate or added tool, but an integral part of the learning process, in the broader sense of a “game-based learning.”¹⁴

3. Action in Cooperative and Collaborative Scenario

In Game Based Learning (GBL), playful elements are an essential part of the learning process. The focus is on competence development on a conative level: It is about the application of knowledge, for example in serious games¹⁵; also, in simulation games or in strategy games (Martens, 2009, p. 42).

14 Gamification elements such as rankings, bonuses, badges and point systems are also used, for example, in serious games as forms of game-based learning. For a distinction between gamification, digital game-based learning, and serious games, see Farber, 2018.

15 Examples of serious games in the school sector are above all “Dragonbox” (see: <https://dragon-box.com/products/elements> last accessed 29.9.21) or in the secondary/tertiary education sector subject-specific games in which one can go through team-building processes within the framework of video games or apply the knowledge learned in architecture, medicine, psychology etc. (see: <https://seriousgames-portal.org/> last accessed 29.9.21).

Video games usually link knowledge acquired separately in teaching programmes with game actions, in that the players have to prove their acquired competences in a given game action by means of avatar characters. The game itself usually takes place separately from the classical teaching context. This can be fascinating in well-designed games, but usually retains a “nice to have” image. The separation is reinforced by the outsourcing of the players to an artificial avatar figure, which – similar to role-playing games – can be assigned alibi functions if actions are not successful. If avatars or roles are not provided for, the players are responsible for their actions as real persons. In simulation games, this applies to a somewhat more limited extent, in that business administration students simulate¹⁶, for example, decisions made by managers in specific industries, while the players in strategy games or *Planspiele*¹⁷ are identical to the game participants.

The advantages of digitally supported and (e.g. through videoconferencing) virtualized simulation games and strategy games are especially evident in connection with the intensified internationalization@home measures due to Corona: They enable the implementation of transnational cooperation with relatively little effort (see Kappe et al., 2021). Within this framework, intercultural experience can be gained, multilingualism practiced, and international university relations intensified. Examples include the implementation of a TOPSIM simulation game by student teams from Bielefeld University of Applied Sciences and the German-Turkish University of Istanbul (Kappe et al., 2021), as well as the transnational, intercultural strategy games “Megacities” (Bolten,

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- 16 See: “TOPSIM – Going Global: The management simulation game depicts six economic regions with different framework conditions. In the role of the management of a washing machine manufacturer, the participants initially operate exclusively in their home region. Soon, however, the focus shifts to the internationalization of the company's activities. Learning content: Corporate mission statement; expansion decisions; international marketing mix; strategic marketing” (see: KB_TOPSIM_GoingGlobal.pdf, retrieved on 31.8.21).
- 17 “TOPSIM – Marketing: In the strategic and competitive business strategy game (Unternehmensplanspiel) TOPSIM – Marketing, the participants manage the marketing department of a manufacturing company. The participants control the operational processes from production to marketing of the products. Depending on the scenario, the products may consist of watches, mobile phones or sport shoes. Furthermore, participants decide on the strategic orientation of the company. Learning content: Objectives and instruments of marketing, market analysis; strategic production programme planning; test marketing; contribution margin calculation” (See: KB_TOPSIM_Marketing.pdf, retrieved on 31.8.21).

2016) and “Bilangon” (Bolten & Berhault, 2019; Bolten & Nietzel, 2021), both conducted via the “Glocal Campus”.¹⁸

Since interculturally unpredictable dynamics are generated by the participants themselves due to the transnational collaboration in the strategy game, virtual strategy games may be seen as intercultural competence developmental actions: The aim is to be constructively competent not only in predominantly familiar contexts (see Fig 1), but also in unfamiliar contexts in which plausibility, normality, relevance and possibilities for routine action are predominantly not given (see Fig. 2, Bolten, 2020a and footnote 1).

Depending on the subject embedding of the strategy games, the learning target focus changes: for example, in the field of intercultural studies, the focus is primarily on the application of intercultural theory and model knowledge, while in the field of business studies, business knowledge is implemented and intercultural competences are addressed more as additional “future skills relevant to the labour market” (Kappe et al., 2021, p. 74).¹⁹ The same applies to international projects that are carried out collaboratively without being embedded in game stories, such as the cooperation in the cross-national production of learning videos (Münch-Mankova & Müller de Acevedo, 2021, p. 155; see also O’Dowd & Lewis, 2016).

The extent to which the strategy games and projects are linked to the cognitive part of teaching, in which the knowledge to be applied was taught, depends on the curricular conditions and the didactic-methodological initiatives of those doing the teaching: Debriefings may take on a bridging function, provided that scenarios of knowledge transfer such as seminars, lectures, etc. offer corresponding reconnection interfaces. If this is not the case, there will be no self-contained dynamic interlocking of the competence levels and no holistic

18 90 universities from 31 countries are involved in the glocal-campus.org learning platform, which is managed by the University of Jena and [interculture.de](https://www.interculture.de). The platform serves to internationalize teaching and research in the fields of architecture, education, engineering, IT, intercultural studies, medicine, and urban studies. In addition to the exchange of digital teaching, joint lecture series and projects, intercultural strategy games on interdisciplinary topics are carried out on an ongoing basis. See the DAAD-funded IVAC project “Blended collaboration in intercultural simulation games”: <https://vi-gil.uni-jena.de>.

19 An important future task of intercultural research and teaching could be to develop practical forms of intercultural support for international academic collaboration scenarios and processes.

teaching/learning process at this point: Collaborative cooperation would remain, then, more or less isolated as an 'exercise' at the level of conatively-oriented teaching.

Fig. 2: *Action Competence and Intercultural Action Competence*



(Jürgen Bolten's own representation, recreated by Carmen Pereyra)

4. Holistic Orientation of the Scimification Approach

In view of the need for rapid change in higher educational teaching due to the pandemic, it is possible at this point to summarize the discussion on the inclusion of game contexts from a methodological-didactic point of view:

- A 1:1 conversion from face-to-face to online teaching is too complex to ensure the necessary level of concentration and motivation. Comparable to the experiences with didactically non-embedded MOOCs, not only too

much learning content but also too little social contact has a negative effect on learning motivation. Game references can counteract this.

- On the cognitive level of the teaching/learning processes, too much content can be counteracted by designing shorter learning units (for lectures 20–30 minutes instead of 1.5 hours). The effect is reinforced by an appropriately varied media design (visualizations, edcasts, gamification).
- The creation of affective access to learning content, such as that offered by gamification tools, relieves concentration and offers good opportunities for, at least, a selective improvement in motivation, provided they are linked to the learning process. If this is not the case, gamification can become an end in itself and divert from the learning process.
- Game-based learning primarily serves the application of acquired knowledge and promotes the development of the conative competence level. The spectrum of offerings ranges from video games to virtual strategy games: Video games refer to general knowledge content on a specific topic rather than to concrete learning processes and scenarios. Virtual strategy games are open-ended, potentially have a high degree of embeddedness in learning scenarios (e.g. in the context of debriefings) and promote the development of social relationships due to their basic collaborative structure.
- Interfaces between the three competence levels are potentially available in digital learning scenarios through gamification or collaboration tools and offer technological advantages over traditional group work in seminars (e.g. storage/export functions and gamification elements in interactive white boards²⁰, or design possibilities of virtual world cafés²¹, which thus facilitate access to collaborative work on an affective level).

There is room for improvement in the practice of linking the described intersections to a holistic learning process in which gamification, game learning and scientific research and development intertwine as components of a teaching/learning process and initiate a momentum and dynamic of their own.

How corresponding scimification approaches may be conceived and implemented is outlined in conclusion on the basis of two IVAC (International

20 E.g. Miro.com.

21 A digital world café may be created using, for example, the tool wonder.me.

Virtual Academic Collaboration) projects that were worked on at the University of Jena (Intercultural Business Communication) from 2020–22.²²

5. Scimification: A Practical Example

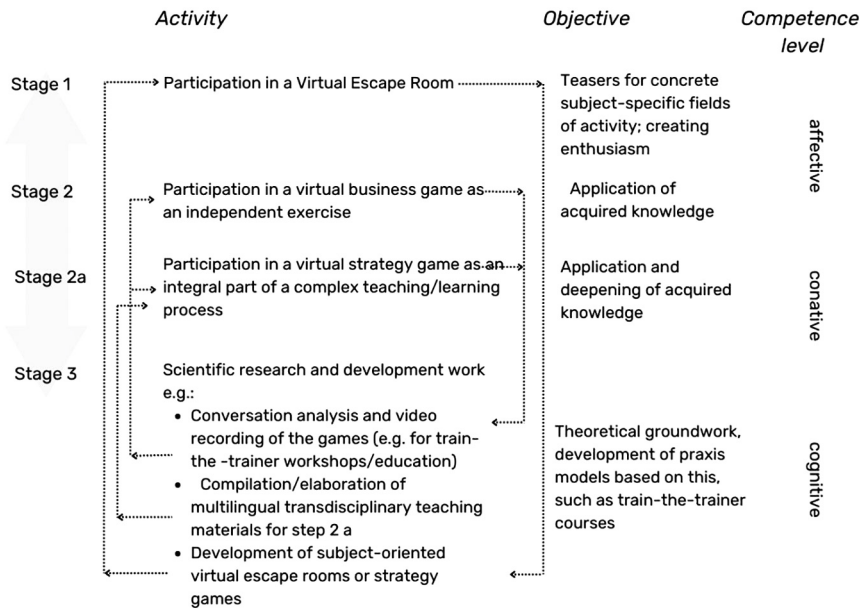
IVAC (International Virtual Academic Collaboration) is a programme funded by the German Federal Ministry for Education and Research and implemented by the German Academic Exchange Service (DAAD) to promote the integration of digital collaboration formats in study programmes within the framework of international teaching cooperation. The University of Jena (Intercultural Business Communication) participated in the first call for proposals in 2020/21 with the project VIGIL, and in the second (2022) with the project VEERIL. VIGIL, at its centre, concerns the implementing and updating of the virtual intercultural strategy games “Megacities” (Bolten, 2016) and “Bilangon 21” (Bolten & Nietzel, 2021), as well as developing a train-the-trainer course for moderating and debriefing virtual intercultural strategy games.

The VEERIL project was concerned with the development of a virtual Educational Escape Room. Other universities participating in both projects include: Université de Montréal (Canada), Université de Poitiers (France), Åbo Akademi University Turku (Finland), Alexandru Ioan Cuza University Iași (Romania), Adam Mickiewicz University Poznań (Poland), and the Beijing Foreign Studies University Beijing (China).

The scimification approach builds on the IVAC projects and links them to a teaching/learning scenario in which affective, conative, and cognitive competence levels are interdependently interlocked. In order to achieve this holistic effect, the scimification approach, visualized in Fig. 3, is structured into three activity stages.

22 In relation to IVAC, see: <https://www.kooperation-international.de/aktuelles/bekanntmachungen/detail/info/daad-foerderprogramm-ivac-zur-internationalen-virtuellen-akademischen-zusammenarbeit> and <https://www.daad.de/en/information-services-for-higher-education-institutions/further-information-on-daad-programmes/ivac/> (10.09.21).

Fig. 3: Scimification Approach



(Jürgen Bolten's own representation, recreated by Carmen Pereyra)

Stage 1 includes participation in a virtual Educational Escape Room.²³ The primary target groups of the version developed in the VEERIL project, with the focus on intercultural learning, were students who wish to include international experience (also virtual) in their studies within the framework of international university exchange programmes, blended mobility activities, or internationalization@home initiatives. It was also aimed at employees in international offices, language centres, and administrative departments involved

23 The learning environment of an "Educational Escape Room" (EdER), originating from the USA, remains largely unknown in the European context (see the research report by Veldkamp et al., 2020). Unlike conventional escape rooms, the aim here is less to achieve a goal (e.g. deciphering a code to leave the room by solving tasks), but to experience the solution path as a motivating learning process and to become eager to deepen acquired and applied knowledge after completing the escape room activities.

with central tasks in the internationalization processes of their respective universities.

One of the main objectives is to motivate people in a playful way to understand and accept the challenges of international cooperation such as multilingualism, varying mindsets, unfamiliarity, and uncertainty as potential opportunities. A central result is, therefore, to overcome threatening feelings, e.g. in foreign-language or generally undefined or 'foreign' situations; not to withdraw, but to find the courage and desire to become active oneself.

The tasks of the intercultural escape room aim to provide a low-threshold and playful way of gaining initial experience in dealing constructively with unfamiliar and possibly unsettling situations. Uncertainty is created through exercises in which the participants are confronted in the virtual escape room with, for example, foreign/multilingual situations, different mindsets, implausible or ambiguous contexts of action, disruptive developments, and, apparently, untransparent facts. A game group should consist of 4–6 people from different universities and be international.

At the beginning of their work in the escape room, the participants are introduced in a lingua franca to the case study they are solving. They are asked to write down all of the expertise they think they can personally contribute to the solution of the case study. The collection of expertise is then visible to all the participants and suggests, for the course of the game, who among the participants has the necessary know-how for certain tasks within the escape room. Specific areas of responsibility and accountability are determined by the participants themselves on this basis at the beginning of the game. In the initial version of the escape room, a goal-oriented solution to the tasks (and thus the 'escape') succeeds on the basis of relationship-oriented communication, team action, knowledge communication, and knowledge sharing. In the foreground of the game life is the possibility to experiment in a protected space and to experience one's own strengths in order to open oneself in this way towards intercultural tasks, also outside of the escape room.²⁴

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- 24 After the cooperation in the escape room, a debriefing is offered in which the participants may reflect on the (intercultural, virtual) cooperation as well as their solution path and formulate expectations, but also "uneasy" feelings, regarding upcoming challenges of intercultural practice. As an option, target agreements for the following weeks are planned, which the participants formulate in the form of a "note to themselves" and hand over to the game leader in a sealed envelope. After an agreed period of time, they receive the envelope back unopened and are thus "teased" to reflect on their own development or to gather further learning experiences (on the next levels).

In principle, an Educational Escape Room can be designed as a ‘teaser’ and a motivational tool for any subject area and discipline – and, if necessary, combined with intercultural challenges. It is conceivable, for example, that largely unknown fields of study, such as urban studies, can be thematically grasped in the game plot of an escape room and that interest in a more intensive engagement with the corresponding courses of study may be aroused.

Stage 2 in the intercultural scimification example outlined here does not necessarily require stage 1 in the chronology of the learning process but potential participants may certainly be encouraged by participation in the intercultural escape room, which may act as a ‘teaser’.

The second stage focuses on the implementation of virtual intercultural strategy games – with the aim of engaging more intensively with challenges, such as the constructive handling of indeterminacy, multilingualism, time differences, and the negotiation of ‘new normalities’ or applying corresponding knowledge (for example acquired in stage 3).

Participants in the virtual intercultural strategy games “Megacities” and “Bilangon” – mentioned above and used in the context described here – consist of three university teams from three different countries. The university teams comprise of 5–20 participants and, ideally, each have a headquarters room at their university, “onsite”.²⁵ The three teams meet once a week for 2–3 hours in video conferences over a period of 6 weeks to solve the common tasks of the strategy game.²⁶ The video conference meetings are supported by collaborative tools such as the whiteboard Miro.

The overarching strategy game case study consists of the transformation of a brownfield site of several hectares into an attractive and liveable area. The brownfield site is divided equally among the cities or regions of the universities participating in the game. The three strategy game teams represent their respective university region in the design task as consultants, where they do not take on a predefined role or simulate the situation, but act as consultants on the basis of their own professional and non-professional expertise. The expertise is made transparent to all participants at the beginning of the game, similar to the procedure described in the escape room. It is possible to recruit

25 With the discontinuation of face-to-face teaching due to the pandemic, the strategy games were no longer conducted in a blended learning format, but completely online.

26 If time differences, semester schedules, or holiday regulations of the participating universities do not allow for continuous meetings, the simulation games are held in a time-adjusted form, e.g. as a block seminar at the weekend.

a limited number of members from other teams if a team lacks important expertise.²⁷

Before the start of the joint planning game phase, the three consulting teams each draw up their own initial concepts for the redevelopment of the brownfield site. With a “cultural” self-conception of their objectives formulated in this way, the teams commence the collaborative phase of the game. The virtual wasteland, as well as the entire interaction scenario, become intercultural fields of action at this moment, as common rules of action remain initially largely undefined and developments in both the game and the group dynamics are difficult to predict.

In the course of the game, the aim is to collaboratively develop a common concept that is acceptable to all participants and, at the same time, does justice to the interests of the three regions. The three teams have to make a series of joint decisions and solve tasks in the individual rounds of the game (e.g. choice of language for the joint game phases; agreements on how to behave in undefined situations such as technical faults and team conflicts; elaboration of common guiding principles; a logo for the planning project; public relations; financial decisions, etc.). Most of the tasks are designed in a manner that requires collaborative and synergy-orientated work in order to find a solution.

The game is ‘won’ when the three teams succeed in creating common ecological, economic, social, and communicative ‘infrastructures’ in cross-team cooperation, allowing for a ‘global’ action scenario – characterized by sustainability – to emerge. On the other hand, the game is also about practising diversity in such a way that the ideas of the individual teams – further developed in the game – are realized in their regions and the members feel comfortable ‘locally’.

Depending on the conference system used, the meetings are recorded by the system itself (Zoom, Teams) or via screencast and used at the beginning of the following meeting for an evaluation of the participants’ intercultural interaction processes in the form of a debriefing: How do they deal with undefined situations? What are the strengths and weaknesses of collaborative working in individual cases? To what extent do they act and communicate in a relationship-oriented/perspective-reciprocal way?

27 As a rule, the recruitment process intensifies situations of uncertainty within the teams because, for example, multilingual action is taken right from the start and unfamiliar assumptions of thought and action may play a role.

At this point, stage 2a offers the possibility of linking the conative and cognitive levels: In order to be able to deal more intensively with questions raised in the debriefing of the recordings, the participants are offered corresponding learning materials on the Moodle platform Glocal Campus. This includes specialist literature on diversity, intercultural team building or multilingualism research, wikis, videocasts and lectures on topics of intercultural cooperation, exchange forums, and peer-to-peer chats.

Since, similar to the escape rooms, the simulation games can be conceptually supplemented with subject-specific challenges in any weighting by adapting the framework story and the tasks (e.g. urban development, political science, tourism research, ecology, social sciences, etc.), the subject-related portfolios on the Glocal Campus expand accordingly. In this way, the strategy game materials are gradually 'rebuilt' with learning materials and specialist literature from different disciplines and countries – potentially, across many student generations. In addition, translations of the game materials into the common languages of the participating university countries and recordings of the strategy games (approved by the participants) are made accessible on the platform.

What is being realized in the current IVAC project context on the part of the seven participating countries, in the sense of the establishment of a foundation, may subsequently be developed further over generations of studies and students, and may initiate transdisciplinary research discourses. In this way, a “multi-paradigmatic sensitivity” (Grosskopf & Barmeyer, 2021) for international research cooperation can be promoted, in which it becomes possible to address currently dominant forms of cultural centrality in research and teaching perspectives and to test new ways of academic networking.

Stage 3 primarily refers to the level of cognitive competence development but is essentially aimed at developing an understanding of the systemic connection of the competence levels. The focus here is on supplementing the described teaching/learning and research materials of stage 2a, while also simultaneously engaging in an in-depth scientific examination of these materials.

The target groups are students and teachers, especially from intercultural disciplines, who are more intensively involved in general intercultural research. They may be interested, for example, in using strategy game recordings for analyses of intercultural discourse or intercultural action processes. This may be done individually or in the form of conventional courses. Ideally, this will lead to cross-university and cross-national cooperation, for example in the context of virtual seminar projects, lecture series, or research projects.

The results of the cooperation become accessible on the Glocal Campus and can, thus, also flow into the further conception and design of the game offerings at stages 1 and 2 (and vice versa). Therefore 'science' and the game/application level are brought together and constitute an interdependent 'scimification' learning scenario that may potentially initiate the aforementioned "competence development" "as a circular movement" (Erpenbeck & Sauter, 2016, p. 112).

In order to be able to actually implement the holistic nature of the scimification approach in practice, it is necessary to a) address the described structural limitations of the competence levels vis-à-vis potential actors, and b) instigate corresponding dynamics and self-initiated learning momentum:

- a) Participation in the escape room (stage 1) acts as a 'teaser' in relation to the interest or enthusiasm for certain subject-specific areas and should conclude with references to corresponding in-depth 'offers', such as participation in the strategy game (stage 2) or in certain courses at stage 3. Similarly, strategy games may be conducted in the sense of 'cross-sectional offers' with a primary game focus, but should, for example, also use debriefing phases in turn as teasers for more in-depth subject-specific offers of teaching materials (stage 2a or 3). Stage 3 teaching units such as lectures or seminars may specifically prepare for strategy games (stage 2), so that in any case a very concrete application of acquired knowledge is possible, and if interest is awakened for subject-specific deepening, feedback to stage 3 also takes place within the framework of, for example, further knowledge deepening (e.g. college courses, BA and MA theses).
- b) In order to implement the mentioned circular cycle between the competence levels as a process, it is helpful to promote self-initiated momentum and dynamics. This can be achieved with the help of viral communication, e.g. via (former) participating actors; but it can also be designed in terms of the curriculum, as is the case with the IVAC projects.

In VIGIL the teachers from the participating universities initially accompany their teams in an organizational manner and participate rather passively in the debriefings of the strategy game management. Supported by the corresponding further materials on the Glocal Campus, after some time they should be in a position to conduct the first debriefings with their group themselves. If participants are interested in more in-depth training, they will be offered an online course "Debriefing of Intercultural Simulation Games" at stage 3, which is fol-

lowed by a certificate and enables one to conduct complex debriefings independently. This in turn motivates you to independently acquire further partners in your own university networks and can generate a multiplier effect.

In the VEERIL project the self-initiated learning momentum is related to the product level: Teachers (here the participants of the VIGIL project) with experience in strategy games and good knowledge in the field of intercultural research and practice enter at level 3. They receive information on the objectives and design principles of Educational Escape Rooms and are asked to participate in an Educational Escape Room of their choice (if possible, in the country of their university location).

In a three-day “design thinking workshop” of the VEERIL project, the teachers then exchange their theoretical and practical experience. Supported by the project management, they jointly design and realize an intercultural virtual Educational Escape Room for stage 1 and conduct a trial run with their students. In this way, the students are introduced to the ‘circular cycle’ and at the same time – depending on their interests and courses of study – become motivated to take part in stage 2 and/or 3.

The teachers, in turn, have created a link between stages 3 and 1 for themselves by creating the escape room. By documenting the process of Educational Escape Room creation as part of their development work and by adding further theoretical or methodological-didactic materials on Educational Escape Room theory from their own particular research context, they establish a new feedback loop in relation to stage 3. In turn, the creation of an Educational Escape Room ‘product’ is a motivating factor to entice other teachers from their own university networks to participate in the escape room or in the creation of an escape room.

An essential factor for the creation of self-initiated momentum and dynamics within the scimification cycle is its curricular integration at the various universities. This is undoubtedly one of the greatest challenges for IVAC projects.

The aim, thus, is to create testing opportunities for the scimification approach. It remains to be seen whether, and how, this will impact the respective university teaching approach and whether it will indeed help create a ‘new normal’ in terms of university teaching, at least within individual areas.

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