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ANALYSING NEW LEARNING CULTURE 3.0: THE MOVE FROM WEB 2.0 TO WEB 3.0 AND IMPLICATIONS FOR TECHNOLOGY ENHANCED LEARNING

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Abstract: *With a focus on Technology Enhanced Learning, this paper investigates if and to which extent a culture shift can be expected alongside with the adoption of currently emerging Web 3.0 technologies. Instead of just offering new opportunities for the field to improve education, such a culture shift could lead to unexpected general consequences not just for Technology Enhanced Learning but the whole educational sector. Understanding the dimension of expectable changes enables us to prevent conflicts and pointedly support culture-related change processes. After an introduction of the Revised Onion Model of Culture, which, later on, serves as theoretical foundation, expectable changes in the design of learning scenarios are analysed, distinguishing the stakeholder groups "learners" and "educators". Eventually, the found changes are analysed to which extent a general culture shift is to be expected in order to understand the transferability and limitations of future research results in the field.*

Keywords: *E-Learning, Technology Enhanced Learning, TEL, Culture, Onion Model of Culture, Revised Onion Model of Culture, Web 2.0, Web 3.0, Learning 2.0, Learning 3.0, E-Learning 2.0, E-Learning 3.0.*

1. INTRODUCTION

This paper investigates with a focus on Technology Enhanced Learning (TEL) if and to which extent a culture shift can be expected alongside with the adoption of currently emerging Web 3.0 technologies. The development of the Internet from Web 2.0 to Web 3.0 is constantly progressing, and not just from the academic perspective, but for very practical reasons, it would be interesting to know, if this change also constitutes a general culture shift in education, and a related culture shift in the context of Technology Enhanced Learning, in particular. We need to understand if such a cultural shift is going to happen across all contexts and stakeholders or if it just involves a particular stakeholder group in a specific context. Else, we are unable to design appropriate supportive measures for the implementation of related technological adoptions into educational scenarios and particularly, ease related change processes and avoid/prevent potential conflicts with actively involved stakeholders. If we actually can assume that expectable changes in behavior and design are culturally motivated, we could analyse the big picture instead of focusing on particular events. We further could use insights and methods from culture-anthropology.

In analogy to Oetting [1], the term "culture" is used in order '*to describe the customs, beliefs, social structure, and activities of any group of people who share a common identification and who would label themselves as members of that group*'. Culture and Education are linked on several levels, such as communication patterns, the behavior of educators and learners within group situations, their understanding of power and respect, their perceptions towards learning in general but also regarding various involved aspects, like feedback, motivation, gender, time management, or technology [2, 3, 4]. Some cultural characteristics, such as fashion, are easily changed; others appear persistent over time. In this sense, culture, even if apparently stabile over longer periods of time, does not constitute a permanent status within a selected society (cultural context) because, at least to some extent, it is expected to adopt and reflect zeitgeist and current life circumstances [5, 6, 7]. Fernand Braudel [8] distinguishes between three historical "rhythms", which are the time of long periods, the time of mediocre-term changes, and the time of short periods. The time of long periods mainly describes geographical phenomena, which change so slowly that people are almost unable to recognize them within their rather short life span. Braudel understands such phenomena as the stabilizing elements amongst other historical rhythms of change. He assigns the mediocre-term changes to the rise, development and downfall of societies and the time of short periods to sudden historical events, which can influence a society's culture right in the moment they happen.

Five years ago, after the full potential of opportunities offered by web 2.0 technologies (particularly, supporting learner participation and contribution) eventually appeared to be adopted to TEL, we deduced factors for the analysis of learning culture from the Onion Model of Culture as designed by Hofstede et al. [9] and used these factors to describe how learning scenarios might change on the way from E-Learning 1.0 to E-Learning 2.0 [10]. We defined TEL using Web 1.0 technologies as "E-Learning 1.0" and if using Web 2.0 technologies, as "E-Learning 2.0". The term "E-Learning 3.0", as later on used, follows the same concept.

First, the underlying theoretical foundation regarding culture in education and its persistence is introduced. There were reasons to develop and apply a more differentiated conceptual culture model than the previously used Onion Model of Culture from Hofstede et al. [9]. Alongside with some term definitions, this model is going to be introduced in the next section. In the subsequent section, a brief overview regarding web 2.0 and web 3.0 concepts and technologies is provided. Afterwards, stakeholder-specific perspectives (learners & educators) are distin-

guished according to the dimensions defined in the Revised Onion Model of Culture in order to differentiate accordingly between Education 2.0 and Education 3.0. Eventually, a transfer to TEL takes place and possible changes in the design of learning scenarios that happen on the way from E-Learning 2.0 to E-Learning 3.0 are discussed. Finally, the found changes are analysed to which extend they might constitute a general culture shift in order to understand the transferability and limitations of research results across (local) contexts.

2. THE PERSISTENCE OF CULTURE

In the following, "culture in education" is used as a general term without a direct relationship to a particular context. It is to be distinguished from "educational culture", which is used when a specific context is referred to and "learning culture", which is related to perceptions of and attitudes towards education (learner perspective).

For our original investigation, which focused on the persistence of cultural phenomena, we adopted the Onion Model of Culture from Hofstede et al. [9]; it is shown in Image 1. Hofstede et al. assigned the cultural phenomenon types "Symbols", "Heroes", "Rituals", and "Values" (from outside to inside) according to the supposed imprinting depth (and thus, persistence over time) within the culture holders' minds. For the sum of the four phenomenon types the authors assumed a quite complete representation of culture. The model is widely accepted and generally was applicable to our context. However, it has some restrictions, which shall be overcome in a revised version of the model.

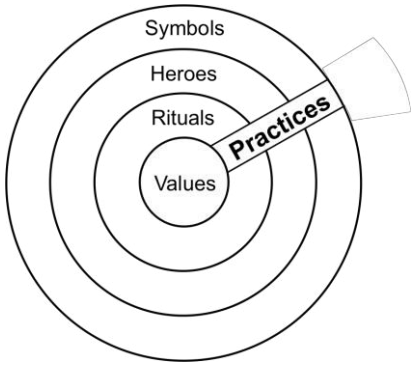

Image 1: Hofstede et al.'s Onion Model of Culture [9]

- The category "Symbols" in the original model was described as '*words, gestures, pictures, or objects*'. It does not distinguish between different types of symbols even though their persistence over time can be extremely different [11, 12].
- The category "Heroes" as defined by Hofstede et al. focuses on light-figures in human society from fiction and non-fiction but completely ignores shadow figures, often called "anti-heroes" [13]. Considering anti-heroes is relevant particularly because a hero in the one society can be an anti-hero in another [14]. Further, neither heroes nor anti-heroes are favoured or condemned as individuals but because of the outstanding characteristics they represent [15]. In this sense, they would rather need to be assigned to symbols instead of forming a very own category.
- In terms of persistence, also "Rituals" require a higher level of differentiation as defined by Hofstede et al. Bell [16] and Schröter [17] understand rituals as mechanisms inherently to stabilize a society. They can be designed for a single event (the funeral procedure of an Egyptian pharaoh) as well as for regularly or irregularly repeated events [18]. Such events can be linked to the current zeitgeist and issues of daily life (such as greeting rituals of youngsters) and thus easily change, but also to traditions (a protocol for coronation), or even religious devotions established thousands of years ago and still maintained.
- The category "Values" revealed problematic due to several reasons. First of all, it generally is unclear if something considered to being a basic value in the one society has the same relevance in another [19]. A second issue resulted from the assumption that the relevance of basic values (at least) is the same for all people living within a common national context (and/or society) [20]: Since colonialisation and conquering forced countless societies worldwide to fusion under a single (often foreign and invading) government, such homogeneity on national level cannot simply be assumed. Third, Hofstede et al. assumed that basic values are more or less persistent over time and thus, would not change [21]. Because of the missing distinction between basic assumptions and social norms (see Schein [22]), laws, which substantiate commonly agreed basic values within a society through written norms [23], need to be assigned to this category; just, up to the reigning entity or party, currently valid laws can spontaneously be changed. Last, the positioning of the category "values" within the model has potential for misunderstandings: In the context of the chosen onion peeling metaphor, "Values" are assigned to the core of the onion. In this position, they obtain an outstanding role amongst the other cultural phenomenon types, exclusively being the only valuable part of the onion [24].

While Singleton and Reyna [24] rather recommend the artichoke as alternative metaphor of choice (because the leaves keep a practical value even after peeling), Goodman [25] claims that erasing a once established metaphor from people's minds is impossible. Cohen and Margalit [26] suggest '*see*[ing] *the death of a dead metaphor as a readjustment*'. In this sense, the onion metaphor was applied to the revised conceptual culture model but readjusted according to its purpose and meaning.

As a very first step, the individual culture holder was put into the centre of the onion and related to the cultural phenomena in terms of perceived relevance (instead of "imprinting depth"). Regarding the relation "relevance", it is assumed that the higher a culture holder values a particular characteristic/phenomenon, the less likely it will be discarded or changed. On the basis of a cross-disciplinary literature research [14], the cultural phenomena were freshly defined and allocated in layers according to their supposed relevance for the culture holder. Table 1 shows the applied changes.

Table 1: The Revision of the Onion Model of Culture

Layer	Original Onion Model	Revised Onion Model
Core	values	CULTURE HOLDER
L1	rituals	basic assumptions & beliefs
L2	symbols	dominant symbols
L3	heroes	social norms & formal rituals
L4		artefacts & formal ritual symbols
L5		behaviour & non-formal rituals
L6		opinions & non-formal symbols

Image 2 visualizes the new design: The perceived (by the culture holder in the core) relevance of cultural phenomena types increases from outside to inside. From the perspective of the researcher, the expectable persistence of cultural phenomena decreases according to their specific types from inside to outside. However, in terms of persistence over time, it must be clear that there is no way to absolutely distinguish between the different cultural phenomena types: Exceptions must be expected [27]. In rare cases, a distinct assignment of a particular phenomenon to a certain phenomenon type might reveal difficult due to multiple relationships.

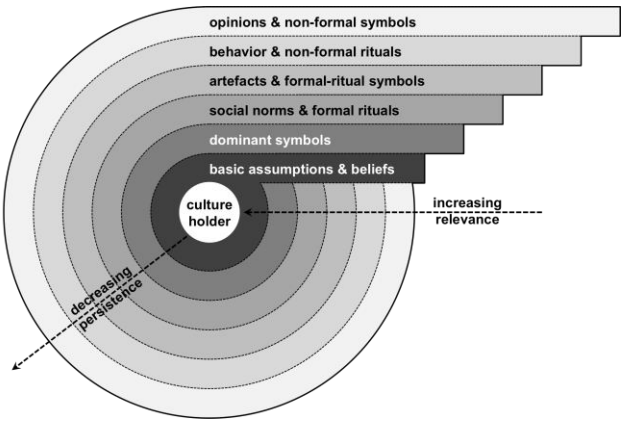

Image 2: The Revised Onion Model of Culture ([14]; herein, content and art work have further been improved)

In the following, the cultural phenomenon types are briefly introduced in detail according to their assigned layers from inside to outside.

L1: Basic assumptions [22] form a part of the theoretical foundation how a society's understanding of the world is constructed. In this role, they are the most relevant cultural phenomenon types for both society and individual culture-holders.
Culture-holders to some extent individually but in essence rather in agreement with the society they live in, transfer the basic assumptions into beliefs. The individuals that form the core community are supposed to have very similar beliefs in common. However, due to the influence of zeitgeist and other factors, beliefs might differ in detail on both, the level of sub-societies and individuals. Beliefs are seen as the main drivers for the construction of a person's worldview.

L2: Dominant symbols [28] represent exclusively selected basic assumptions and are supposed to have a very similar life span. However, dominant symbols are assumed to being more likely modified or discarded than the underlying (represented) basic assumptions. Thus, they are allocated a layer below. Individuals generally are not expected to have enough influence to change dominant symbols.

L3: The role of social norms is to support the proper functioning of a society by setting implicit or explicit rules. Social norms define which kind of behaviour generally is expected from the members of a society and acceptable in order to secure and maintain the society. Usually they translate basic assumptions into rules of conduct for daily life. However, when defined in the context of sub-societies, social norms might not be directly related to basic assumptions but rather they might be influenced through the particular beliefs, the members of the related sub-society have in common. Individual culture-holders can directly (on sub-society level) or indirectly (through political elections) influence social norms. Social norms are also influenced by the current zeitgeist, which they, in return, also influence themselves. On society-level, social norms often are translated into laws, which serve as tools to enforce proper behaviour [23, 29]. After the relevance of a basic assumption has changed, it is likely that related social norms will be adopted accordingly. It cannot be assumed that social norms likewise influence their underlying basic assumptions.
Formal rituals are activities that are carried out in a distinctly defined way to emphasize the relevance of basic assumptions and support the culture-holders' beliefs (and understanding). Since formal rituals at least indirectly also support social norms, they have been assigned to a layer below dominant symbols.

L4: In the context of rural societies in Africa, Turner [28] distinguishes dominant and ritual symbols whereas ritual symbols still have a formal character. Signs, which play a role in industrial societies (e.g., typical symbols to represent branches), have little meaning in (his investigated) rural societies. For the Revised Onion Model of Culture, Turner's class of ritual symbols was further subdivided into Formal Ritual Symbols and Non-Formal Symbols whereas latter are expected to have a shorter persistence. Formal-ritual symbols are designed to represent social norms and aspects of formal rituals. Formal-ritual symbols can vary in relevance between sub-societies.
Artefacts are somewhat special amongst all cultural phenomena types since, as results of human producing, they represent but also are influenced by a society's zeitgeist. In this sense, they are cultural phenomena in their own right. They are produced on all levels, from core society to individuals. Artefacts can be [22] tangible (architecture, paintings, sculptures) and intangible (music, literature, poems, philosophy). They are not directly related to any other cultural phenomenon type. The positioning of artefacts on this level, as an assignment of relevance, is

based on the supposition that basic assumptions and social norms are more relevant.

L5: Behavior is what individuals actually do in the diverse situations according to their general view of the world. Behavior is indirectly (view of the world) influenced by, but does not necessarily fully reflect, one's beliefs because social norms, the current zeitgeist, the individual situation in life, and also personal opinions are major influences. Since behavior is openly visible to others and may lead to consequences if deviating too much from what the society is able or willing to accept, it is expected to be more relevant for the culture-holders than opinions.

Non-formal rituals [30] mainly support artefacts and follow a less rigid protocol than formal rituals. They are carried out on all levels of society. Non-formal rituals can support the maintenance of historical events and ancient traditions. They can manifest in rather particular contexts, be it in very specific modes for greetings or as parts of an agenda at business dinners. They can also be designed for singular opening ceremonies for museums, and they can be implemented in the context of music festivals or other festivities (which all, themselves, are artefacts). On sub-society level, non-formal rituals can also support specific social norms. Non-formal rituals can have a supportive function to teach "proper" behavior. Non-formal rituals are directly influenced by the current zeitgeist, beliefs, and social norms.

L6: Opinions and non-formal symbols are supposed to have the lowest relevance for culture-holders amongst all considered cultural phenomena types. Opinions generally are made on individual level and are mainly influenced by the culture-holders' general view of the world, the situation in life, and the current zeitgeist. Opinions are not necessarily in line with beliefs, basic assumptions, or social norms, but anyways, directly influence ones behaviour. Individual opinions should not be underestimated in their relevance for societies: When they are shared by a critical mass of culture-holders, their absolute level of relevance can scale up, and they can even have an impact on social norms and basic assumptions.

Non-formal symbols are meant to represent aspects of non-formal rituals as well as artefacts (as directly related signs). They can be designed and used on all society levels.

3. ADVANCING INTERNET TECHNOLOGIES

On the change from Web 1.0 to Web 2.0, the static presentation of information (text and images [31]) in the Internet was improved by the opportunity to contribute through direct and indirect communication and to jointly work on documents; paired with a lot of multimedia formats that allowed further individual contributions. While Web 1.0 focused on the technology itself and provided access to static information, the technology in web 2.0 became a means to communicate and develop creativity. Web 2.0 eventually focused on the user who turned from a simple consumer to a communicating and contributing participant, even to a creator [32]. Chisega-Negrila praises the establishment of *Web 2.0 as* '*a turning point in human interaction via computers, fostering social networks and even more personal environments for educational purposes*' [33]. On the way from Web 1.0 to Web 2.0, basic technologies (hardware and software) changed and not just new applications were added. It is assumed that the shift to Web 2.0 would never have been possible if the hardware on the users' (clients') as well as on the network providers' sides would not have developed the way it did. This is quite different to the currently emerging Web 3.0, also called the "Semantic Web". Sure, technological progress continuously took place on all levels but the development and implementation of Web 3.0 technologies is driven by the idea that what already exists (big amounts of data) is not yet fully used. As an example, various studies show that search engine users just consider the search results presented on the first page and many users even never look beyond the top three search results [34]. Thus, when speaking about Web 3.0 technologies, we mainly refer to concepts and software-based solutions instead of tangible pieces of technology: In the context of Web 3.0, the technology from Web 2.0 will not be substituted but enriched threw additional functionalities. Most of such changes are going to be implemented on the side of content or service providers, fully invisible for the users. The masses of data interesting for further interpretation can be movement and activity protocols of users (recorded in the background), personal data, videos, pictures, reports, blogs, documents, and others. This enormous, worldwide-distributed and "freely" available database is growing since Web 2.0 was established. With such a mass of data and widely improved search algorithms, building ontologies [35] and webs of relationships between the data, agents can generate new information, which can be turned (by the users) into knowledge [36]. While the unrestricted usage of the available data includes vast risks in terms of data protection, the decreasing level of privacy for individuals, and insecurity to which extent intellectual property rights actually are secure [31], it is supposed to contribute advantages in all fields, also – or particularly – in education. As specific educational areas that benefit from Web 3.0 technologies, Ohler [37] refers to knowledge construction, personal learning network maintenance, and personal educational administration. Ohler further claims that the '*Semantic Web is historically unique in that for the first time society can see a foundational shift in technology well in advance of its arrival*'. Rubens, Kaplan, and Okamoto confirm Ohler's claim: '*The concept of Web 3.0 is still in its infancy, but we are starting to see a number of early indicators that Artificial Intelligence (AI) will become an integral part of the Web 3.0*' [38]. Harkins [39] calls education using Web 3.0 technologies '*Knowledge Producing Education 3.0*'.

4. EDUCATORS AND LEARNERS IN THE EDUCATIONAL PROCESS

It is assumed that if a culture-shift takes place in education on the way from Education 2.0 to Education 3.0, it first of all must be found alongside with educational practices. Thus, the first question to answer is which general role the different cultural phenomenon types actually play in the teaching/learning practice of the most involved stakeholders for the learning/teaching process. As for

simplicity, there is no explicit distinction between educators and tutors. For the further analysis, the perspectives of "learners" (Table 2) and "educators" (Table 3) are outlined according to the Revised Onion Model of Culture.

Table 2: The Learner's Perspective in the educational process in terms of the Revised Onion Model of Culture

Phenomenon Type	Learners
L1: basic assumptions	Responsible for the general differentiation between good and evil; Influencing perceptions of the value of education, the role of the self in society and of peers and educators, etc.
beliefs	Responsible for the way, how concrete actions are carried out and events in the environment are interpreted. Mainly respect persons, such as educators and elder peers in class influence beliefs. However, also events, such as repeatedly failing examinations can directly influence beliefs on individual level. Amongst others, beliefs influence behaviour and attitudes, general decisions who superior and/or inferior persons are, the understanding of gender-related issues, the personal image of the self, and the way how others are treated.
L2: dominant symbols	Apart of particular fields of education (e.g. ethics, philosophy, religion), dominant symbols are considered to play a minor role in the practice of education (in western industrial countries), since they are mainly related to fundamental religious issues.
L3: social norms	Social norms, as written laws, regulate e.g. the duty and right for education up to a certain age or level. They further on shall ensure that the treatment of the learners and the evaluation of their work results are as fair as the society demands. Non written social norms define which kind of behaviour is expected and accepted within the society.
formal rituals	Formal rituals might be carried out e.g. when learners welcome their educator, ask for permission to speak, and when they receive their degrees. However, in the educational sector the majority of rituals is expected being non-formal.
L4: artefacts	Learning materials; school uniforms; individual work results; youth language; the school building; school environment.
formal ritual symbols	e.g., school uniforms; school flags; the traditional order in frontal teaching how tables are organized;
L5: behaviour	A kind of compromise between basic assumptions, social norms, and beliefs: While basic rules of behaviour are settled, the decision on following these rules is individual.
non-formal rituals	All kinds of daily rituals related to the educational process: The way to school; discussions with other learners; social rituals amongst learners like communication rules and youth languages; repeated events during school-breaks; doing homework; studying.
L6: opinions	Supposed to be individually different but influenced by peers, events, and respect persons. Directly influence the way how discussions take place.
non-formal symbols	Signs, e.g. standing for anarchy, peace, nuclear energy, etc.; the purple scarf and the rainbow for gender emancipation; also branch symbols (any kind of fashion) may play a huge role, particularly in schools.

Table 3: The Educator's Perspective in the educational process in terms of the Revised Onion Model of Culture

Phenomenon Type	Educators
L1: basic assumptions	Responsible for the ethics, which are to be taught to the learners and on which used methods and approaches found.
beliefs	Responsible for the way, how concrete actions are carried out and events in the environment are interpreted. It might be socially accepted to exclude a pupil if it repeatedly disturbs the lecture but it is a matter of the educator's belief if the educator evaluates such this as useful.
L2: dominant symbols	Part of the role of the educator is to help the learners to understand their environment. Thus, in cases of respective lectures, the function and meaning of dominant symbols need to be promoted and in all other cases, dominant symbols must not be misused.
L3: social norms	Social norms in form of written laws support the educator to fulfil his/her duties but also define restrictions regarding the educators' operational freedom. Such restrictions are related to the way, educators treat learners, but also to the learners' personality- and intellectual property rights. Unwritten social norms are e.g., pedagogical paradigms; the relationship between educator and learner; Social norms are further on integral part (at least in schools) of what educators have to teach.
formal rituals	General teaching methodologies; Welcoming learners in the beginning and releasing them in the end of the lecture;
L4: artefacts	Particular clothes supposed to be worn and actually worn; The pointing staff; the school itself and the teaching environment; exhibits produced/designed by the teacher such as lecture notes, learning pathways, etc.
formal ritual	"Helpful tools" such as red pens to

symbols	mark failures (in Germany); the tally sheet for recording troublemakers in classroom.
L5: behaviour	The way, how an educator actually treats his/her learners and carries out the education under consideration of formal and non-formal regulations and the own belief.
non-formal rituals	Rituals in the educational process apart from the curricula, e.g., organizing parents' consultation; providing feedback to learners; the daily way to work; the daily activities during breaks; communication patterns;
L6: opinions	In the context of education, opinions might officially be inline with the recommendations of the educational institution. However, opinions are individually quite different.
non-formal symbols	Not essential for educators; Anyways, understanding the meaning of the various non-formal symbols of the learners can turn relevant for teaching success.

While not all cultural phenomenon types considered within the Revised Onion Model of Culture influence educators and learners alike, related issues from both of the groups were found for all cultural phenomenon types. This justifies the application of a higher level of distinction as provided in the model. Today's research on culture in education mainly is carried out to improve the instructional design in such a way that perceptions of learners with different social and cultural backgrounds are better understood and thus, unnecessarily distracting conflicts can be avoided or, at least, settled. The need to profoundly understand cultural differences between learners in nationally heterogeneous classrooms is not anymore exclusively limited to urban education. With the yearly growing numbers of migrants within Europe and across the world, also rural schools are affected. In the context of Technology Enhanced Learning (TEL), the issue of multinational classrooms is even more eminent. Using Internet as means for communication and for the delivery of educational contents, it would just be natural to welcome learners from all over the world. However, in lack of cultural understanding, the provision of TEL often keeps limited to a national auditory [40]. In the last step, it is analysed if the adoption of Web 3.0 technologies constitutes a culture change in TEL (E-Learning).

4. FROM E-LEARNING 2.0 PRACTICE TO E-LEARNING 3.0: A CULTURAL SHIFT?

When Technology Enhanced Learning moved from E-Learning 1.0 to 2.0, one of the most significant changes was the increasing independence from a locally installed "Learning Management System" (LMS). In E-Learning 1.0, the whole learning process was isolated within a local learning platform and learners were supposed to exclusively "consume" what they found there. With the shift to E-Learning 2.0, a LMS became a gateway to the Internet, where learners and educators likewise conducted literature research and looked for additional supportive teaching/learning materials. Supported by the newly achieved opportunities for collaborative work and synchronous bi-directional communication, TEL, further on, turned learner-centered (instead of limiting the focus on the educator as exclusive information source), and Learners got the chance to jointly develop learning results through collaboration, fully supported by related software-tools [41, 42].

With the opportunities of the semantic web, E-Learning 3.0 is supposed to provide vast improvements to E-Learning 2.0 [35], such as personalized (software-)agents; these generally know about the learners' preferences and their current field of study, so that they automatically can support them through conducting ontology-based search and communicating with other agents in order to deliver tailor-made information when needed. E-Learning 3.0 further on is supposed to support learners to determine their own studying agenda within commonly agreed borders: By semantic querying, courses and whole programs can be re-constructed through learners in a way that the user's individual topics of interest and requirements are focused. In terms of professional training, the semantic web offers opportunities to combine all issues of business processes and further training in a single platform (no media break through multiple platforms) in order to support further training according to the actual current needs of the enterprise. Since the Web 3.0 is conceptualized to provide a fully decentralized "platform", cooperative content management (through various independent providers) will be a new asset of E-Learning 3.0. Through the distributed nature of the Semantic Web, the opportunity to steadily improve learning materials additionally will be included in E-Learning 3.0 [35]. Another aspect where E-Learning 3.0 will be able to provide massive improvements is in the context of learning analytics: By constantly monitoring the clicks of users, their learning pathways can be determined and feedback on how to improve ones individual learning practices can be provided. Further on, an automatic reporting can take place in direction of the educator, who can integrate successful learning pathways into future teaching plans and strategies.

Many of these changes directly or indirectly require a change of attitudes and/or educational practice. Thus, links to culture-sensible issues appear likely. In terms of acceptance, also individual perceptions might need to be re-evaluated on the basis of cultural sensibilities. In the following Table 4, features of E-Learning 3.0 are being analysed towards their relevance in the cultural sense.

Table 4: E-Learning 3.0 affecting culture

Layer	E-Learning 3.0 vs. Culture
L1: Basic assumptions & beliefs	• Web 3.0 technologies generally concern the stakeholders' perceptions of privacy and data security; • Permanently feeling monitored (learner) could have negative consequences for the learning process; • Personal relationships and communication might highly be valued and strongly missed when (partly) substituted by agents; • Feedback through machines might lack the empathy necessary to pre-

	serve the dignity of the learners;
L2: Dominant symbols	• In terms of dominant symbols, E-Learning 3.0 is not expected to cause intercultural conflicts; • Symbols in Terms of e-Learning 3.0 are means for usage. Dominant symbols anyways should never be used with levity;
L3: Social norms & formal rituals	• Is the (open) usage of personalized and private data in accordance with local laws, such as privacy and personality rights? • How to avoid that software agents "accidently" search private web space? Can Internet users be forced to being up to date in terms of Internet security and Hacking to avoid such incidents? • When and how far is support through software agents acceptable for work results and how to evaluate such work results from students? • Intellectual property rights generally might be concerned (e.g., when recording learning pathways from students or when learning contents from different providers are mixed); • To whom belongs an intellectual output basing on some directive data when fully produced by a software agent? • Formal rituals generally appear not to be affected by Web 3.0 technologies;
L4: Artefacts & formal ritual symbols	• In Web 3.0, machines will (co-)produce artefacts, e.g., in form of (tailor made) information collections: How to evaluate creative outputs from students (e.g. art) at least partly supported by agent based systems? • Formal ritual symbols should not further be affected neither by Web 3.0 technologies nor E-Learning 3.0. The responsibility for the usage of particular symbols still belongs to the users;
L5: Behaviour & non-formal rituals	• Social interaction generally might be affected but this issue requires more investigations;
L6: Opinions & non-formal symbols	• Opinions: This issue requires additional investigations; • It is possible that agents construct new non-formal symbols or that existing ones loose relevance.

5. CONCLUSION

The analysis revealed some aspect directly and others at least indirectly touching culture-specific peculiarities. In terms of efforts to preparing the community for the coming changes, these and further issues should be targeted to avoid future users' rejection on a general level.

Related issues are, for example, the concepts of individuality, privacy and data security, but also the users' general relationship to technology, which can be quite relevant when learners (or educators) need to accept that the system takes decisions for them. Further on, not everyone might welcome the idea of being supported by a machine instead of a person. In such cases, learners should still have the chance to being coached by human educators.

For more specific investigations, the yet achieved understanding of learning culture points towards the fact that particularly regarding the issues usability and acceptance, a transfer of research results across the learning contexts "School Education", "Professional Training", and "Higher Education" is not easily possible in the same way it is within. In countries with multicultural population, also different societies need to distinctly be investigated. For investigations in the context of E-Learning 3.0, methods from culture anthropology generally can be adopted.

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