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CORPORATE SELF-DISCLOSURE IN SOCIAL MEDIA

Self-disclosure is a well-known phenomenon in interpersonal relationships. The term has also been applied by previous research to corporate-consumer relations, but there are some differences between the two concepts. This paper tries to find a common ground, offers a new definition for corporate self-disclosure (one that is in line with the previous terminology but is closer to the interpersonal approach) and by the means of qualitative research it investigates its possible use in corporate-to-consumer communication. The author also argues that social media is very suitable field for corporate self-disclosure.

Keywords: branding, self-disclosure, social media

Recent years have seen a rise in interest in brand to consumer communication. With the emergence of social networks companies that traditionally had little or no communicational contact with their consumers found themselves in a position where they had almost no choice but to start communicating. Research shows that in social media rules are very much different than those in the traditional media. Weineberg (2009) argues that transparency is expected and altruism is the new norm. This requires a very different approach than traditional (mass) media. This paper shows that while self-disclosure is widely accepted to be a foundation of enhancing interpersonal relationships, it is used only in a very limited sense when talking about corporate-to-consumer communication (mainly used by CSR literature to describe content of corporate self-reports that barely ever make to the consumers).

Traditionally, branding has been led by a manager who was in total control of the whole communication process focusing exclusively on the positive and suppressing alternate perceptions (Weston, 2013). Christodoulides (2009) criticized this practice as one displaying the characteristics of those of a “narcissist”. With the rise of the internet an especially social media current branding practices focus more and more on concepts like transparency, building relationship with the consumers. Further research in this area might help companies who still experience significant trouble coping with the changed landscape.

This research suggests that “self-disclosure” (which is well-known in psychology literature and have been applied to interpersonal relationships for decades now) might offer considerable help in navigating under these new circumstances. The current paper starts with discussing how the term has been used for interpersonal relationships than it shows that although much less intensively and in a slightly different meaning it has also been used to describe corporate communication mainly in CSR literature.

In the second part findings of an explorative research is presented that (1) helped shaping the definition for this phenomenon (self-disclosure in corporate-to-consumer relations), (2) offered an overview of possible gains and pitfalls of corporate self-disclosure. Managerial implica-

tions and suggestions for possible future research directions are offered in the closing section.

Literature review

Self-disclosure and self-representation

There has been a growing research interest in self-disclosure and self-representation in online environment ever since internet started its massive growth in the 90's. In the early stages the main areas of such researches were websites, followed by online support groups, forums and multiplayer or massively multiplayer online (MMO) games – and even dating sites (Gibbs et al., 2007). After the rapid expansion of social media applications more and more research focused on social network sites (SNS) where people could easily create their own online presence (“self-representation”) and were naturally encouraged to participate in self-disclosure.

In this section a brief overview is offered of (1) how psychological literature defines and describes these two concepts and (2) what antecedent and consequences are associated with them – before moving on to investigating the particular phenomenon of self-disclosure and self-representation on SNSs.

Journard interprets self-disclosure as some kind of ‘personal transparency’ – “yourself manifest, showing yourself so others can perceive you” (Journard, 1971, p. 19). This is a natural phenomenon that takes place whenever people meet with each other. By merely standing in another person's presence one reveals multiple chunks of information (visible traits like sex, approximate age and weight – but often also more personal things like the current mood, etc.). The information shared usually gets deeper and deeper with more personal encounters. People share information about themselves in both verbal and non-verbal way. In literature self-disclosure is usually synonymous with verbal disclosure. Self-disclosure plays a vital role in human interactions. It is a defining characteristic of intimate relationships (Brehm et al., 2002), some researchers even argue that it is the most important process in relationship development (Harvey – Omarzu,

1997). But it is not limited to intimate relations, from business partnerships to workplace affiliation it plays central role in all sorts of relationships.

Revealing information about self is multiple-staged process. Social penetration theory argued that while usually in the initial stages of a relationship only basic information is shared between the partners (like name, hometown, hobbies, etc.). But as the relationship grows mature, deeper – more intimate, sensitive and emotional – information would be exchanged (Altman -Taylor, 1973). Therefore McCarthy (2009) made a distinction between self-disclosure and self-description: the latter being a more formal phenomenon that only describes less personal information.

Self-disclosure plays vital role in relationships – both in bonding and maintaining personal and/or other types of relations. People engage in self-disclosure in a variety of ways in every relationship they have though the content and the degree of self-disclosure may vary in each of those. To be able to measure self-disclosure Altman and Taylor proposed it to have three dimensions:

1. Breadth: the amount of information exchanged. One can make a distinction on the number of different categories self-disclosure contains (“breadth category”) and the breadth frequency that is the number of all different “items” within one breadth category.
2. Depth refers to the intimacy-level of the information exchanged.
3. Duration is the length of time self-disclosure occurs within an interaction (Altman – Taylor, 1973).

Self-disclosure is “rare resource” in the sense that it has significant and positive impact on the relationship to be selected as a recipient of a (perceived) scarce message (Archer – Cook, 1986). Some researchers state that the value of self-disclosure is based on its scarce nature. People might react more positively if they perceive the received information to be more intimate. (Even marketing utilizes this positive correlation when certain corporations (usually luxury brands) disclose information like new products, limited editions, etc. to a preselected group of consumers only who in exchange value this as special, distinguishing treatment.)

Consider the following statements: “*I finished high school*” and “*I love you*”. It is obvious that the latter “information” is more intimate, but there are other key differences too. The first one is a describing the other is an evaluating type of self-disclosure. The first one simply states a factual information, the second reveals some sort of personal opinion. According to Altman and Taylor (1974) self-disclosure might convey (1) cognitive, (2) emotional or (3) behavioral information.

Research has shown a number of consequences of self-disclosure. Intimacy is closely related to particular types of self-disclosure in both computer mediated and face-to-face communication. Collins – Miller (1994) enumerates three possible different types of connection between liking and self-disclosure:

1. people might like more those who disclose to them more,
2. people might disclose more to people whom they like,
3. people might like others as a result of disclosing to them.

Another relational outcome of self-disclosure is trust. Multiple studies verified the correlation between trust and both the breadth and depth of self-disclosure. This is true in online context, and interestingly online self-disclosure is found to be able to build “offline” trust: Mazera et al. (2009) states that teachers, who exhibit higher levels of self-disclosure on Facebook are found to be more credible by students.

Tokic and Pecnik (2011) found that self-disclosure serves three key functions in adolescents’ relationship with their parents: (1) promoting intimacy, (2) regulating autonomy and (3) heightening individuation.

Self-representation is a very similar phenomenon. It is generally defined as “a behavior that attempts to convey information about oneself – or an image of oneself – to others” (Baumeister – Hutton, 1987). There are two types and motivations of self-presentation: (1) presentation meant to match one’s own self-image and (2) presentation meant to match audience expectations and preferences. There are notable differences in online and offline types of self-representation largely due to the controlled nature of online media:

1. There is a greater emphasis on verbal and textual elements of communication in online environment. This enables a greater control in comparison with face-to-face communication where non-verbal elements might become dominant (these are harder to keep under control).
2. The contact is usually made in an asynchronous manner that again enables parties engaged in the communication to send thoughtful, well-constructed messages (Gibbs et al., 2007).

Self-disclosure and self-representation in online context

Both self-disclosure and self-representation seems to be essential in SNS research. Both have been used before in literature to describe user behavior in social media. One of the most commonly accepted definition and classification of SNSs include “social processes” (self-disclosure and self-presentation) as two key elements of social space (Kaplan – Haenlein, 2010). But even before social media emerged people used personal websites to present themselves in cyberspace. Generally speaking there are several distinctive features of online environment that affects self-disclosure as shown in the *Table 1*.

According to Kilian (2013) SNSs are personal forums where users tend to share deeply personal even sensitive or intimate information with friends or the general public. The nature of the online media makes it feasible for users to carefully craft the messages or chunks of information

to be shared. This applies to both personal and corporate users. Research also shows that self-disclosure helps maintaining relationships in online context.

Table 1.
Distinctive characteristics of face-to-face self-disclosure and self-disclosure in computer mediated communication

| | Face-to-face (FTF) self-disclosure | Self-disclosure in computer mediated communication (CMC) |
|--------------------------------|------------------------------------|--|
| (Perceived) anonymity | Low | High |
| Visual cues | High | Low/missing |
| Physical distance | Low | Unknown/high |
| Control of conversation | Generally low | Higher |
| Pace of conversation | Faster | Usually slower |
| Number of participants | Mostly two / limited | Two (private chat) or unlimited (public posts) |
| Reciprocity of self-disclosure | Usually expected | May or may not be expected (eg. with public posts) |

Source: Literature review conducted by author

Another important and interesting aspect of online self-representation is that people/corporations engage in information sharing with different types of interest groups at the same time. When discussing interpersonal relationships this means that users share information about themselves to groups that they would otherwise handle in a very distinct manner. For instance, sharing party pictures with friends is nothing uncommon – but when looking for new career opportunities one would definitely not want a possible future employer to see those images.

This issue is not new in a sense that it is a well-documented fact in literature that while basic personality characteristics are consistent over time individuals might choose to play different roles for a given audience (Arnett et al., 2003) – these roles even might explicitly be in conflict with one another. Heide and Wathne for example (2006) focusing on relationship roles of friends and businesspeople in marketing showed that as a "friend," one uses a "logic of appropriateness" will follow established rules, while as a "businessperson," the same person's decisions are guided by utility-maximizing considerations under a "logic of consequences".

But in online context the nature of social media makes an important difference: in SNS context switching between roles might prove difficult. As one's network grows in numbers and diversity it might require a considerable amount of effort to choose information to be shared. The situation is even more complex as the network primarily consists of people with whom the user also maintains offline relationship – therefore the user is sensitive to the audience's opinion of the items shared in social media. Killian (2013)

argues that one way to cope with this challenge is for users to try to exhibit an idealized self-image in SNSs. They can also opt to avoid/or keep sensitive topics to a minimum.

To have a better understanding of how users share personal information in SNS context two new psychological concepts are needed to be investigated: self-regulation and self-control. "Self-regulation is the broader term, encompassing both conscious and unconscious processes and sometimes referring to all behavior guided by goals or standards, whereas self-control refers more narrowly to conscious efforts to alter behavior, especially restraining impulses and resisting temptations" (Baumeister, 2002, p. 129). The individual capability to apply self-regulation varies greatly among people. It is thought to be a depletable resource.

Self-regulation has been shown to affect profoundly user behavioral pattern in SNS context. Users with greater ability to perform self-regulation use SNS platforms in a more focused manner and are more efficient in creating and consuming content. Emotions play a smaller role in their use of SNS applications: they seek expediency (Rouis et al., 2011).

Proposing the concept of corporate self-disclosure

The previous section demonstrated that self-disclosure is an important factor influencing the creation and maintaining of personal relationship in both face-to-face (FTF) and computer mediated context (CMC). Revealing intimate and personal information about self helps strengthen and deepen interpersonal relationships. The question that arises: can we detect self-disclosure in corporate (brand) – consumer relations?

The question is not as far-fetched as it might seem. First, there is a large and growing literature on the anthropomorphizing of brands which is defined as "the belief that consumers tend to perceive branded products as if these objects were humans" (Guido – Peluso, 2015). Tamasits – Prónay (2018) argued that consumers might display emotions toward brands similar to those seen in interpersonal relationships. Brand managers have been shown to encourage anthropomorphizing in several ways from product design to naming and promotion. Several brands try to exploit this in a variety of ways like using anthropomorphism to make their brand more memorable and exciting, to strengthen existing brand associations or simply to make the brand more likeable.

This tendency also deeply affects the two-way communication between consumers and brands (Markos-Kujbus, 2016). In this new context brands elicit effects previously seen for responses to people (Aggarwal – McGill, 2011). More studies showed that people might form relationships with brands that are similar to interpersonal ones (Guido – Peluso, 2015).

The second argument for self-disclosure in corporate – consumer relations is the fact that in CSR literature there are a handful of research that builds on corporate self-disclosure in a very specific way. According to recent researches one main problem in evaluating any firm's

corporate social responsibility is that the source of most data available on the topic is the firm's self-disclosure like company and stakeholder self-reports (Font et al., 2012). This obviously affects measurement reliability, validity, etc. but for us it also sheds light on the fact that companies do use self-disclosure in their communication activities. The term "self-disclosure" or "corporate self-disclosure" is used in this sense and refers almost exclusively to CSR, social self-reports and other documents. These – while they undoubtedly form a crucial part of corporate communication – barely reach consumers en masse.

A third and closing argument comes from the field of services marketing. Regarding the operations of a company, Greyson (1998) makes a distinction of three separate "stages":

- frontstage: operations and workspace customers perceive to be created for them to have access to,
- backstage: operations and workspace customers have no access to,
- perceived backstage: operations and workspace that customers perceive they shouldn't have access to (but they do).

Creating a "perceived backstage" can be understood as one type of corporate self-disclosure where the organization tries to create the illusion of sharing something unique or "intimate" with the consumer.

Other than all those reasons it is a fact that branding has changed profoundly in the (post) internet era. "Post-internet branding is about facilitating conversations around the brand. Consumers are now wired and capitalize on social networks to derive power from one another. They develop their own perspective on companies and brands, a view that is often in conflict with the image a brand wishes to convey" (Christodoulides, 2009). Weston (2013) argues that companies can survive and thrive the changed landscape by using co-creation as a philosophy for branding through social media. This means a relational approach to branding where the consumer is involved as an equal partner.

Terminology

Before moving onto describing the research, it is important to discuss terminology. As a conclusion of previous literature review one can argue that there is a phenomenon in brand-to-consumer communication that is very similar in nature to that which is described in psychology literature by the term "self-disclosure". On the other hand: in marketing/CSR literature self-disclosure is used in a slightly different meaning (mainly referring to self-reporting documents that barely reaches ordinary customers). The current paper uses the term self-disclosure in the former sense. An exact definition is offered later on based on research findings.

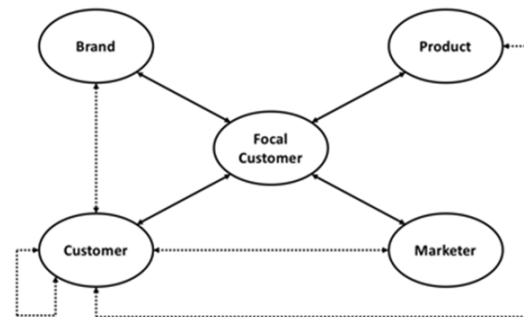
As in McCarthy (2009) a distinction is made between *self-description* (formal, less "personal" information about self – this case: company) and *self-disclosure* (more "intimate" information about self).

Proposed framework and research method

The current research design used a slightly modified version of the customer-centric model of brand community that was proposed by McAlexander, Scouten and Koenig in their frequently cited article (McAlexander et al., 2002). The reason to choose this model was twofold: first, it incorporates every major factors of brand communication and second, it was extensively used in SNS research (cf. Milán-Díaz, 2014). (Figure 1.)

Figure 1.

Customer-Centric Model of Brand Community
Dashed lines are not included in the original model



(Source: McAlexander et al., 2002. p. 39).

This approach assumes that brands (marketers) communicate both directly and indirectly (through focal customers) to customer and similarly customers have direct and indirect contact with products. In line with literature due to the nature of SNSs communication observed among customers is also a distinctive factor.

The main research questions were the following:

RQ1. Is there or what is the an equivalent of "intimate" information seen in interpersonal relations in corporate-to-consumer ones?

Note: all the other research questions posited below become meaningful only if the research reveals that there exist equivalent factors of intimate information in corporate-to-consumer relations.

RQ2. What possible outcomes might have on brands corporate self-disclosure in social media (SNSs)?

Social media seems a natural choice for self-disclosure for companies as they gradually need to assume the role of content providers (Csordás – Gáti, 2014). But this RQ is a long one that includes multiple dimensions in it – so to be able to shed some light on this particular issue the following auxiliary questions were defined:

RQ2a. How can brands benefit from self-disclosure in their relationship with consumers on SNSs?

RQ2b. What are the pitfalls of corporate self-disclosure in their relationship with consumers on SNSs?

RQ3. Of all the possible corporate-consumer relations stated in Figure 1. which can contain elements of self-disclosure that affects the relation in any way?

All these research questions suggest that this is a new complex phenomenon that requires a holistic approach. Because of these specifications an explorative research was conducted to gain better understanding and so semi-structured focus group interviews were used. The semi-structured nature of the interview refers to the conative approach as described by Malhotra and Birks (2007): the emphasis was on exploration, with analysis taking place during and after the group interviews. There was less structure to the questions, and in both focus groups members were encouraged to take their own paths of discussion, make their own connections and let the whole process evolve.

The objective of this small-sample, non-representative study was to uncover underlying factors and provide understanding of self-disclosure in corporate-to-consumer relationships. Two focus group interviews were conducted, one with 5 and one with 6 respondents. Participants were chosen from an MA class at a business university. (This also meant that while the literature review section focused on both corporate and consumer aspects of self-disclosure the research mainly investigated the consumer side of the phenomenon). The interviews lasted 95 and 104 minutes respectively and were tape recorded with the consent of the respondents for further analysis. During the interviews an assistant moderator created notes that were later clarified and complemented based on the audio recording which resulted in 46 pages of transcripts (not verbatim) (Krueger – Casey, 2002). Partial verbatim transcripts have been created of certain parts of the focus group interviews to enable deeper analysis.

Both focus group interviews started with the moderator briefly covering the objectives and the nature of the study. In the first, much shorter section respondents were asked about self-disclosure in interpersonal relations. This was done to (1) to clarify their understanding of this phenomenon and (2) familiarize them with this issue. Responses made in this sections were generally irrelevant to our study therefor were largely not interpreted during the analysis. In the second, longer section (after they become familiar with research terminology) they were asked about self-disclosure in general in corporate-to-consumer relationship before systematically exploring relationship elements described in *Figure 1*. In this section respondents were also asked to come up with their own examples of corporate self-disclosure and also to analyze different types of it (the analyzed examples are included in *Appendix 1*.)

Discussion

Self-disclosure in corporate-to-consumer relationship

Respondents were quick to apprehend the gist of terms “self-description” and “self-disclosure” in corporate-to-consumer relations. Self-description was universally accepted by all respondents to be observable in branded communication. It was debated however whether self-disclosure could be applied to relationship outside

the context of interpersonal ones. Key differences that emerged in the focus groups are summed up in the *Table 2*.

Table 2.

Key differences of interpersonal and corporate-to-consumer relationships that could affect corporate self-disclosure

| | Interpersonal | Corporate-to-consumer |
|---------------------------------------|---|--|
| Emotions | All kinds of emotions are observable | Some respondents viewed companies as non-sentient beings that are unable to show any emotion |
| Trust | Key element in the relationship | Might occur but not dominant |
| Relationship | Honesty or trust based | Interest based, manipulative |
| Environment | Friendly | Characterized by competition |
| Intimacy | Key element in deep personal relationship | Not applicable |
| Reciprocity of self-disclosure | Possible and frequent | Some respondents viewed consumer to corporation self-disclosure as impossible to exist |

Source: research

A few respondents viewed trust as a central issue that might be distinctive in interpersonal and corporate-to-consumer self-disclosure. One very specific objection was raised in the second focus group: “*If we accept that self-disclosure conveys more intimate, personal information about self then it also means that by self-disclosure one – in a sense – becomes vulnerable to the other party. That is why it is able to build trust: one person trusts a valuable personal information to the hands of another person. I can't see a way this would work in corporate communication. Why would a company offer its consumer to know its weakness?*” (Male, 28). Later on, this objection was dissolved in group discussion. Respondents agreed that while exposing vulnerability cannot be expected from corporations (due to the competitive nature of the markets) building trust can be achieved by either (1) other types of self-disclosure (as to be seen later) or (2) “exposing” “perceived” vulnerabilities (one that in the eyes of the consumers looks like a vulnerability but in reality, is not). An example mentioned was the Hungarian bank Magnet who – unlike other financial institutions – offers description on how their pricing structure is made up.

Similarly, intimacy has been discussed. “*As I come to think of it, much of my own “self-disclosure” really was in connection with sharing intimate information. How could a company share something intimate? Intimacy can only be present in interpersonal relationships*” (Female, 25). No interviewee in neither focus groups could point out anything similar to intimacy in corporate-to-consumer communication.

Finally, another key dimension was discussed: reciprocity. Opinions on this issue were split mainly because a few respondents denied that consumers would disclose self to corporations. However, in defining corporate-to-consumer self-disclosure this is not an issue as (1) unreciprocated self-disclosure might happen in interpersonal relationships too and (2) other respondents showed examples that in fact it might happen. “Browsing the web, using Facebook – everybody exposes very deep, intimate information to not only these companies – Google, Facebook, etc. – but to those also, who buy consumer data from them” (Male 25).

In the focus groups participants were asked to describe their latest act of self-disclosure and the emotions they associate to it. Later on, they were shown a few examples of what were deemed to be examples of corporate self-disclosure (see *Appendix A*) and again they were asked to describe their feelings and any thought they associate to these corporate messages. The answers received were transcribed (verbatim) and a word cloud was generated based on the most frequently used words in both cases. (Figure 2.)

Figure 2.

Word clouds of the most frequently used words to describe personal experiences on self-disclosure (left) and examples of corporate self-disclosure (right). The size of the word indicates frequency of occurrence



Source: research

The similarities are obvious, but there are differences too:

- in personal self-disclosure there were very vivid descriptions of uncertainty even feelings of vulnerability that was completely missing in its corporate equivalent,
- personal self-disclosure is deeply connected to emotions while corporate self-disclosure (when trusted upon) is seen as something “brave”, “responsible” and “honest”,
- multiple respondents expressed distrust of various forms and intensity for corporate self-disclosure.

Both focus groups concluded that both self-description and self-disclosure is observable in corporate-to-consumer relations. Not every company does it and not to everyone, but it is definitely a phenomenon that is worth further investigation.

Definition and key elements of corporate self-disclosure

Suggested definition of corporate self-disclosure

Based on literature review and primary research the following definition is suggested: *corporate self-disclosure is the voluntary act of sharing internal information to any stakeholders (but primarily to the consumers) through a media that is most likely to reach the affected stakeholder or group of stakeholders.*

Respondents agreed that one key dimension of corporate self-disclosure is voluntariness. In this sense the meaning of “self-“ is twofold: it refers to (1) the internal nature of the information revealed (i.e. it says something about the company itself) and (2) the motivation to reveal it is also internal (and not because of legal or governmental pressure, fact-finding journalists, etc.). One participant summed it up: “revealing some information for the fear of legal consequences is like confessing something personal only because somebody is holding a gun to your head. It is really not self-disclosure rather forced-disclosure” (Female 23).

Next the medium used for delivering corporate self-disclosure message was discussed. Respondents were first asked to evaluate a product recall message where a well-known retailer recalled a hair clipper product line for safety reasons (they found the clipper could catch fire or even explode posing serious threat to life). The message emphasized that it was the company’s own decision to do so, as there was no external pressure in this case. The message was published online via the company’s website and later received some press coverage (one newspaper article was shown to the participants).

Reactions of the interviewees were largely positive: “It is absolutely positive that the company is capable of admitting its own mistakes”, “it was the honorable thing to do”, “it improves my overall opinion of the company”.

Next the company’s Facebook page (with 713.000 likes) were also shown on, before and after the day when the product recall was made. The company made no public Facebook post about the recall of the hair clippers. This fact immediately changed the respondents’ mood and opinion. Many comments accused the company with manipulation and being unfair to its consumers: “this is no fair to the consumers, seems they are afraid of negative changes to their reputation”, “this is manipulation at its worst”, “first I thought they are very responsible to reveal this sensitive information to the public, but now I see they are really not interested in really reaching the consumers. They want to protect their own image more than the lives of their consumers”.

From all this one can draw the conclusion that it is not enough for a company to be honest – they have to do it in a way that reaches its consumers. This is in direct contrast with the definition of self-disclosure in CSR literature where it mostly refers to self-reports and other documents that barely ever reach the actual customers. “The medium is the message” (McLuhan, 1964).

Finally, the “internal” nature of the information conveyed in self-disclosure was also investigated. Respondents

were presented with a Facebook post of a Hungarian bank that conveyed information on the reason for the pricing of a certain account package. This information is rarely made public opinions split on this issue. Some argued that this is an honest, creative and self-revealing message. *“This is a consumer-friendly solution, one that is very fair and honest. It is courageous, cool and innovative”* (Female, 22). Others debated the fairness and called it a marketing scam – but even most of them acknowledged that it might be powerful to convince other consumers. *“I can’t believe that it is so, it’s only marketing. But it might be able to create the impression of being a transparent bank”* (Male, 24).

To better understand where consumers expect (or at least hold credible) corporate self-disclosure the model shown in *Figure 1.* was used. (*Table 3.*)

Table 3.
Consumers’ expectations regarding corporate self-disclosure

| Type of interaction | Can it be affected by corporate self-disclosure? | Examples of possible corporate self-disclosure |
|---------------------|--|---|
| Brand – consumer | Yes | Revealing hidden information on the brand to the consumer Inviting consumers to a “behind the scenes” tour (virtual or real) |
| Consumer – consumer | Yes | eWom, consumers discussing corporate messages |
| Product – consumer | Yes | Revealing otherwise hidden information on the product (eg. pricing structure) Revealing information damaging to corporate image (eg. product malfunctioning or recall) |
| Marketer – consumer | No | - |

Source: research

Goals (possible benefits) of self-disclosure on social media

According to Ignatius – Kokkonen (2007) the following types of information might be revealed in interpersonal self-disclosure: thoughts, feelings, aspirations, goals, failures, successes, fears, and dreams, as well as one's likes, dislikes, and favorites. But what can a company achieve by revealing otherwise hidden information to the general public, selected consumers or a group of consumers? In the previous section of this paper three possible examples of corporate self-disclosure were described. These were also presented to the respondents of the focus groups. By analyzing their reactions their answers were grouped into possible benefit categories:

- enhancing consumer involvement: respondents used wording like “pride”, “sympathy”, “cool”, etc. that indicate that their involvement with these brands,
- enhancing brand value: multiple interviewee reported an overall positive emotional change in their attitude towards the brand after being exposed to corporate self-disclosure,
- enhanced eWom: consumers found corporate self-disclosure messages to be interesting and therefore might have a positive impact on the volume and orientation of consumer-to-consumer talks on the brand,
- self-revealing inconvenient truth or mistakes might leave the company in control of the events that unfold. If the company is the first to publish report on its own error media and government have less room for maneuvers.

Threats (possible pitfalls) of self-disclosure on social media

Using the method described above multiple threats of corporate self-disclosure were uncovered. One obvious threat is damaging corporate and brand image by revealing errors, mistakes. It might even have a multiplier effect. One respondent said after reading about the “whale incident” of Maersk: *“They just might as well trying to protect themselves of possible fall out, or I can even imagine that they are covering up for something even bigger. What if the whale was in deed alive and the captain in fact did nothing to avert collision? By coming out first with the story they had control over the message and prevented finding themselves in a defending position”* (Male, 24). This indicates that by telling the truth some consumers might feel that they are being fed only half-truth and the company still has things to hide.

It might help the forming of negative emotional or cognitive bonds. A remarkable proportion of the words used in connection with the afore mentioned examples of corporate self-disclosure were extremely negative, ones that companies would be at pains to steer clear of.

Revealing unfavorable product information might damage sales. *“I instantly become worried if we purchased that item. Also, in the future I might think twice before buying electronic merchandise at this shop”* (Female, 23). The shop in question is not a professional electronics manufacturer but it does distribute consumer electronic devices under its own private label. As consumers do not view this shop as an expert in manufacturing, revealing information on product malfunction might have a greater negative impact.

While considering the downsides to self-disclosure in certain situations managers have to give thought to considering the threats of trying to cover up inconvenient circumstances. This might have its own serious consequences.

Managerial implications

Current research shows the need for further changes in corporate-to-consumer communication. The literature review section of this paper referred to self-disclosure

in a parent-child relationship. One interesting aspect of well-functioning relationships of this kind is that self-disclosure starts to affect deeper layers of the personality as the child grows mature. When doing everything to cover up every little failure or even mistakes of the company to show an immaculate, sparkling clean image what the managers are doing really is treating their consumers as if (1) they're unable to process negative information and (2) they will immediately turn their backs on the corporation if they see imperfections.

Will honesty pay off in the long run? It's a tough question not easy to answer. The current research had the serious limitation of excluding competition and competitors in the examination. It is possible that revealing weakness or internal information could seriously damage the company's legitimate self-interest. But it is arguable that revealing imperfections, mistakes or information that would normally would remain a company secret (like pricing structure of a financial institute) might have an opposite effect and enhance the relationship of the corporation and its consumers.

Both literature and current research suggest that social media is the right medium for corporate self-disclosure. There are numerous reasons for that. Communication on SNSs is more open and honest, transparency is the norm, fallibility is not only pardonable but sometimes it seems to be even desirable (Weinberg, 2009). Also it is capable of reaching much more consumers than corporate websites.

Finally: every aspect of self-disclosure needs to be carefully designed. Threats are very real. Consumers might even feel deceived if they anticipate that the company is not 100% honest or uses tricks on them (eg. publishing on low traffic websites to avert attention). Much thought needs to be given to the selecting of the communications channel and target group(s), wording of the message, timing and other factors.

Limitations and possible further research directions

In the closing section limitations of current research is discussed and further research directions are offered. There were little room to expound the well-known limitations associated with qualitative research. The research framework did miss many important factors including the following ones:

- It didn't take the dynamics of the relationship into account. The possible consequences of corporate self-disclosure might be quite different if the consumer has little or no knowledge of the firm or if the consumer has long been familiar with it.
- It solely focused on the relationship of the corporation and the consumer. It is obvious that this relation exists in its own environment – one that is characterized by the actions of such stakeholders like government/legislation or competitors.

Due to the explorative nature of the current research possible benefits and pitfalls were covered but did not discuss

how to exploit/avert them. This is a hot issue that might be a topic of a future research. Given the nature of corporate self-disclosure such a research might help a great deal in understanding this phenomenon.

In this paper there were no room to discuss consumers' self-disclosure to corporations. Literature shows there is another direction for research and that the personal self-disclosure of people might include branded content (eg. defending loved brands in SNSs in personal discussions). This (consumer to corporation) type of self-disclosure might raise serious privacy issues as more research (eg. Simay – Gáti, 2017) shows that consumers are becoming increasingly more concerned about their personal data handed over to companies.

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A. Appendix 1. Examples of corporate self-disclosure used in research

Maersk Norwich whale strike

2012, június 8., 13:30G

Maersk Line does everything it can to avoid creating a negative impact on the marine environment. Despite these efforts on Wednesday 6 June we saw images of a 12 metre long whale caught on the bulbous bow of the Maersk Norwich. This image, of a noble and elegant creature accidentally struck down by a Maersk Line vessel deeply affected us all.



Below are some of the questions we were asking ourselves in Maersk Line:

What happened after the whale arrived in port?

When the ship arrived in the Port of Rotterdam, the Port Authorities called a zoologist to examine the whale. According to our information from the port, the whale was most likely dead when hit by the ship. The whale has been sent for destruction by the zoologist.

What do we do in general to avoid striking whales?

Maersk Line watches from the bridge for marine mammals as well as vessels, and we participate fully in measures designed to reduce the probability and severity of ship strikes.

In the US, we slow to less than 10 knots in designated zones, as defined by National Oceanic and Atmospheric Administration (NOAA), and have worked with World Shipping Council (WSC) and NOAA to have radar speed data provided to each shipping line to prevent these incidents from occurring.

We are working to better understand the science related to whale behaviours and how to reduce the probability of hitting marine mammals. We are members of the World Ocean Council and continue to meet with NOAA and others concerned with marine mammals.

Does the fact that we are slow steaming make a difference?

Yes, it does. According to NOAA slower speeds reduce likelihood of injury or fatality when a strike does occur.

What are the regulations on this, and does Maersk Line comply with them?

The NOAA fact sheet on the US speed reduction zones states – and we comply with it – that vessels are to travel at less than 10 knots in designated areas, which cover almost all Atlantic ports from November to April each year. There are also dynamic voluntary speed reduction areas – alerts to vessels when groups of whales are spotted in a particular location.

At Maersk Line, we track vessel speed compliance extra carefully during the seasons when whales are likely to be present.

How does Maersk Line protect the oceans, wildlife & biodiversity? What's your sustainability strategy on this area?

Maersk has long been an environmental leader in the shipping industry. As such, we fully support the Final Environmental Impact Statement (FEIS) on "Right Whale Ship Strike Reduction" as we wish to help this endangered species repopulate the oceans.

Maersk Line and Maersk Line Ltd. are members of the World Shipping Council (WSC) and have worked closely with WSC throughout the development of the FEIS and proposed rules. We have openly shared our experiences with both WSC and with NOAA, including providing an experienced ship's captain to consult with both WSC and NOAA on this issue.

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Vaskor Máté
ÚJSÁGÍRÓ. 2018. 03. 26. 17:02



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CULTURAL FIT AND ACADEMIC PERFORMANCE OF HIGHER EDUCATION STUDENTS

This study provided empirical evidence on the relationship between cultural fit and individual performance in an area where it is rarely investigated: the academic achievement of higher education students. The authors employed an adapted version of the Organizational Culture Assessment Instrument (OCAI) to estimate individuals' culture fit (as the inverse of the difference between the culture as it is perceived and as it is preferred by the respondents), and the indicator of students' performance was their semester grade average. Their sample consisted of 348 full time higher education students from a Hungarian university. Based on linear and rank correlation, as well as linear regression analyses the authors have found that higher education students' cultural fit tended to relate positively to their academic performance.

Keywords: organizational culture, person-culture fit, higher education, individual performance, OCAI

Our article provides empirical evidence on the contribution of person-organization cultural fitness to the individual performance of higher education students. The study follows a management sciences point of view, thus we narrow down the notion of organizational culture (hereinafter OC) to models that are measurable with valid and reliable instruments.

OC became particularly important – and at the same time more interesting – for management researchers when the first convincing clues had been found about its impact on various organizational performance indicators, even on financial measures (for a summary see Schneider – Ehrhart – Macey, 2013). The search to understand the way organizational culture contributes to success was mainly focused on finding the type or attributes of culture that generally lead organizations to success (e.g. Kotter – Heskett, 1992). As the number of studies and the area of the investigation extended, significant differences were revealed among sectors and branches (see Lee – Yu, 2004), thus patterns of the relationship between OC and performance identified in one field cannot be applied directly to another.

The contribution of OC to organizational level performance, however, may not depend solely on the exact type or features of the culture itself. At this point, we entered another area of research. Both economics and management sciences know that the effect of the allocation of the workforce to jobs is far from negligible. From the human resource management point of view there are at least four dimensions of a successful match between the employment opportunity and the employee. These are the 'person–job fit', the 'person–group fit' (including the supervisor), the 'person–vocation fit', and the 'person–organization (P–O) fit' (Kristof-Brown – Zimmerman – Johnson, 2005). One aspect of the P–O match is the 'cultural fit': i.e. how well the person fits to the OC (Meyer et al., 2010).

The current study examines the effect of cultural fit in higher education institutions (HEIs), focusing on non-employee members of the organizations (students) and a non-financial performance indicator (the academic perfor-

mance of individual students). As far as the authors are aware, the significance of cultural factors in higher education students' performance has been analyzed multiple times, as will be presented in the literature review section, but not from our perspective. The previous studies we review tried to find the ideal culture or cultural features along several OC models, including the one we use. However, we could not find any attempt to measure the effect of cultural fitness itself. Other papers that focused their attention on the relationship between student performance and their institutional fit did not employ the OC models which feature in the management literature. Thus, the current study can contribute to the existing literature by narrowing the gap described above; partly via the new empirical results, but more importantly by finding proof that the cultural fit between student and institution can be related to individual academic performance, and that this fitness and this relationship are measurable. Measurability is crucial from the management point of view, since it is the basis of understanding and control. In other words, managers of HEIs may find our results useful as they offer a possible tool to influence their organization's performance.

In sum, our article seeks an answer to the following research question:

Does the cultural fit perceived by higher education students tend to relate positively to their individual academic performance?

Our data were collected at the University of Debrecen, Hungary. The selected OC model was the Competing Values Framework (CVF), and the measurement tool was an adapted version of the Organization Culture Assessment Instrument (OCAI); they will be introduced later in the article. The performance indicator was the students' self-reported average grade.

The paper is structured as follows. First, based on a literature review we establish the definitions used in our research. Second, on the basis of the previous studies we form a hypothesis for empirical testing. Third, we intro-

duce our empirical examination: sample, methods and results. Finally, we answer the research question and the hypothesis, and reveal the limitations of our results and the possible directions for further research.

Literature review

Since our paper is primarily empirical, our review will focus on providing only the necessary background to the empirical analysis. In the first part of this section the concept of the OC as we use it in our analysis is defined, then a more specific area, the OC of higher education institutions (HEIs) is discussed by a review of empirical results from the literature.

The concept of organizational culture

The so called ‘culture-excellence’ approach emerged in the early 1980s as a new paradigm at that time, and as a response to increasing Japanese competitiveness (Burnes, 2009). The core concept of that paradigm was that culture determines performance.

Although at that time many writers criticized the methodological shortcomings of the approach (Carrol, 1983; Lawler, 1985), a long list of empirical studies demonstrated the impact of OC on organizational performance (see, for example, Cameron – Ettington, 1988; Gordon – DiTomaso, 1992; Trice – Beyer, 1993; Marcoulides – Heck, 1993; Lim, 1995; Ogbonna – Harris, 2000; Hajnal, 2006; Fekete – Dimény, 2012; Klein – Wallis – Cooke, 2013; Schneider et al., 2013; Pinho – Rodrigues – Dibb, 2014).

As a result, today researchers and practitioners agree that OC exists and that it is a significant factor to take into consideration in organizational studies, although there is still little agreement on what the term ‘organizational culture’ covers (Alvesson, 2013; Schein, 2010; Van den Berg – Wilderom, 2004). Since research into culture lies at the intersection area of several social sciences (anthropology, sociology, social psychology, organizational behavior), a diversity of approaches and definitions have been developed (Schein, 1990); and many controversies highlighted which relate to the definition, to the measurement, or to the key dimensions of OC (Cameron – Quinn, 2006).

Cameron and Ettington (1988), after reviewing a representative sample of papers containing definitions of culture, found that among the most frequently mentioned notions were the following: cultures are enduring sets of values, beliefs and assumptions that characterize the organizations and individuals within the organizations.

We have found the following definition to be the most appropriate for our research: ‘the culture of a group can now be defined as a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems’ (Schein, 2010, p. 18). This relatively new definition emphasizes that culture has an important role in the group’s adaptation to the external

environment and, as a consequence, it has an impact on performance.

Regarding the measurement issue, at least three different strategies can be used (Cameron – Quinn, 2006) and distinct research methodologies can be applied (Schein, 1990). (1) In the holistic approach the investigator engages in the observation, and tries to become part of the organization. (2) In the metaphorical and language approaches the investigators disclose cultural patterns with the help of language patterns in conversations, stories, and documents. (3) In the quantitative approach investigators use questionnaires or interviews to evaluate the attributes of the OC. In our analysis we will follow the third strategy.

When analyzing OC, researchers frequently apply models which have emerged out of certain dimensions to describe OCs. We can differentiate content and pattern dimensions (Cameron – Quinn, 2006). Content dimensions are aspects of an organization’s culture which help to recognize it. Good examples of content dimensions are the following (Cameron – Quinn, 2006):

1. ‘The dominant characteristics of the organization, or what the overall organization is like.
2. The leadership style and approach that permeate the organization.
3. The management of employees or the style that characterizes how employees are treated and what the working environment is like.
4. The organizational glue or bonding mechanisms that hold the organization together.
5. The strategic emphases that define what areas of emphasis drive the organization’s strategy.
6. The criteria of success that determine how victory is defined and what gets rewarded and celebrated.’

The above six notions represent the content dimensions of the OC Assessment Instrument (hereafter OCAI) which we use in our empirical research. OCAI is a validated and accurate measurement tool in diagnosing important aspects of OC (Cameron – Quinn, 2006). With the help of this instrument it is possible to identify the current as well as the preferred OC. Among the several management areas where it can be a valuable diagnosing tool – e.g. team development (Suderman, 2012) and quality management (Basir et al., 2017) –, there is evidence that it is able to predict organizational performance (e.g. Gordon – DiTomaso, 1992; Iriana – Buttle – Ang, 2013).

Pattern dimensions refer to a cultural profile. In the management sciences literature a wide variety of pattern dimensions are mentioned, such as internal-external focus, speed, riskiness, participativeness, clarity, power distance, masculinity, and individualism (Cameron – Ettington, 1988). Cultural strength, cultural congruence and cultural type are the most dominant, and most frequently analyzed, pattern dimensions in the literature. Cameron and Ettington (1988) found the effectiveness of organizations connected more strongly to the type of culture than to cultural congruence, or to the strength of a culture. Other studies found these three patterns (type,

congruence, strength) to be equally important differentiating factors between high and low-performing companies (Kotter – Heskett, 1992).

The OCAI framework follows a sociological foundation as well as the functional approach (Cooke – Rousseau, 1988): it assumes that culture can be explained by certain dimensions, and that quantitative methodology is useful to analyze OCs (Cameron – Quinn, 2006). Since we will use this instrument in our empirical research in the rest of our literature review, we summarize several studies which have analyzed OC with quantitative methods, discuss cultural fit, and investigate the link between OC and organizational performance. Over the decades, many quantitative tools for diagnosing OC have been invented. We have already mentioned OCAI (Cameron – Quinn, 2006). Cooke and Rousseau (1988) used the OC Inventory to evaluate OC. Glaser and Zamanou (1987) diagnosed OC with OC Survey and incident interviews. They combined quantitative and qualitative methods in their research, similarly to Hofstede, Neuijen, Ohayv, and Sanders (1990). Hybrid methods are also present in OC analysis, like pattern matching introduced by Burchell and Kolb (2003).

Organizational culture of HEIs

In the beginning, business organizations were at the center of research on OC, but most of the concepts, approaches and models can be used in the case of non-profit organizations as well. In our paper the institutional culture of a HEI will be analyzed, thus we present various research findings from this field. Studies of OC in higher education institutions (HEIs) vary both in the model they use and in the subjects they collect their data from (Kuh – Whitt,

1988; Tierney, 1988). Since there are far too many models available to a researcher, here we only mention some examples (see Table 1), rather than offering an exhaustive list.

Studies can focus on staff, on students, or on both. Among the 15 reviewed papers 11 focused only on the staff perspective (managers, lecturers, administrators, library workers). Three studies gathered data on the HEIs' OCs solely from the students; while both the staff and the students were the object of Zhu and Engels's (2014) research. As even our non-representative review of studies has been able to highlight, the OCAI framework is a popular measurement instrument in the OC analysis of educational institutions. Nine out of the fifteen papers presented in *Table 1* employed this culture-diagnostic tool.

In the literature reviewed which used OCAI one can find clues about the culture types the students or the given staff perceive or prefer, and about the connections between culture types and innovativeness and student commitment; however, there is no evidence about the relationship between students' cultural fit and their academic performance. Knowing how important the area of person–organization (P–O) fit in general human resource management is (Chatman, 1989; Caldwell – O'Reilly, III 1990; O'Reilly III – Chatman – Caldwell, 1991; Lauver – Kristof-Brown, 2001; Kristof-Brown et al., 2005; Adkins – Caldwell, 2004; Wei, 2013; Alfes – Shantz – Alahakone, 2016), the question of student–institution fit seem to be missing from the above list of research into the culture of HEIs. As we see it, this hiatus is present only when it is the management literature that analyses HEIs.

There are, however, other – non-managerial – areas of sci-

Table 1.

Reviewed papers on Organizational Culture of HEIs

| Author(s) | Organization | Sample | Measurement tool | Research focus | Main result(s) |
|-------------------------------|--|--------------------------|---|--|--|
| Pushnykh and Chemeris (2006) | 1 university in Russia | staff members (N < 900) | modified OCAI plus 100 interviews | The appropriateness of the OC | Neither the current nor the preferred OC meet the challenges. |
| Fralinger and Olson (2007) | 1 university in the USA | students (N = 50) | OCAI | Current and preferred OC | Perceived and preferred OCs are clan culture. |
| Shirbagi (2007) | 1 university from India and 1 from Iran | lecturers (N = 333) | OCAI, OCQ (Organizational Commitment Questionnaire) | The connection between organizational commitment and OC | There is a positive connection between clan culture and organizational commitment. |
| Ferreira and Hill (2008) | 2 Portuguese universities | staff members (N = 114) | OCAI | Comparison of OCs of a private and a public owned university | There is no overall difference between private and public universities. |
| Kleijnen et al. (2009) | 18 university departments in the Netherlands | teaching staff (N = 266) | OCAI | Current and preferred OC | The experienced culture was (moderately) flexibility- and control oriented, the preferred form being flexibility oriented. Significant differences were found among departments. |
| Balogh, Gaál and Szabó (2011) | 1 Hungarian university | students (N = 1242) | OCAI, CQS (Cultural Intelligence Scale) | Preferred OC and cultural intelligence at a workplace. | The majority of students would prefer to be employed in a clan culture, those with high cultural intelligence prefer adhocracy. |

| | | | | | |
|---|---|---|--|--|---|
| Kleijnen et al. (2011) | 18 departments at universities in the Netherlands | teaching staff (N = 266) | OCAI | Teachers' conceptions of quality and organisational values. | Teachers tend to show a neutral preference for control-oriented values and a high positive preference for flexibility. |
| Bencsik, Marosi, and Dóry (2012) | 1 university in Hungary | teaching staff (N is unknown) | OEI (Organizational Effectiveness Inventory), OCI (Organizational Culture Inventory) | Readiness of the HEI to introduce a knowledge management system | The culture preferred by the teaching staff more or less fits with the culture needed by a learning organization |
| Van der Velden (2012) | 2 universities in the UK | 2x4 key staff (N = 8) and document analysis | McNay's typology extended by the author | How institutional culture relates to engagement with students. | The preference of students is a collegial, partnership-based approach for "enhancement of the student experience". |
| West-Moynes (2012) | 4 publicly funded colleges in Ontario, USA | administrative staff (N = 44) | OCAI, MSAI (Management Skills Assessment Instrument) | Current and preferred culture types and the management skills of the administrators | Consistency exists between preferred dominant culture type and management skills of administrators. |
| Zhu and Engels (2014) | 6 Chinese universities | teachers (N = 186) and students (N = 865) | (OCES) Organizational Cultural Environment Survey | OC and instructional innovation | The features of OC affect the perceived need for and the views about innovation. |
| Chandler and Heidrich (2014) & Heidrich and Chandler (2015) | 1 Hungarian college | employees (N = 334) | OCAI, MOI (Market Orientation Inventory), interviews | Diversity of culture among staff and this diversity's impact on market orientation | 5 subcultures were identified with varying market orientation. |
| Zhu (2015) | 6 Chinese universities | lecturers (N = 684) | OCS (OC Scales) | OC of Chinese HEIs, and its relationship to and teachers' perceptions, responsiveness and implementation of technology-enhanced innovation | OC is associated with teachers' perception of and responsiveness to innovation and implementation of technology-enhanced innovation. |
| Castellanos et al. (2016) | 2 HEI in the USA | students (N = 238) | UES (University Environment Scale), CCS (Cultural Congruity Scale) | Cultural-fit vs. college and life satisfaction | Perception of the university environment was the strongest positive predictor of college satisfaction, whereas cultural congruity was the strongest predictor of life satisfaction. |
| Du Mérac (2015) | Public secondary schools in Rome. | students (N = 600) and Scouts (N = 231) in upper secondary school | ECPQ (Educational Context Perception Questionnaire) | Compare the impact of the school environment to the Scouting environment on the leadership attitudes. | The impacts are different between students and Scouts. |
| Chidamburanathan and Regha (2016) | 40 higher education libraries in the United Arab Emirates | employees (N = 263) | OCAI | The current and the preferred OC | Clan and adhocracy characterize the perceived OC. Stronger clan and adhocracy, while weak market and hierarchy features are preferred. |
| Basir et al. (2017) | 2 Malaysian universities | key personnel (N= 22) | semi-structured interviews developed by the authors | The connection between cultural dimensions (academic freedom, individualism, professionalism, and collegiality) and quality management | Academic freedom, individualism and collegiality had worked against ISO maintenance. The opposites of individualism and collegiality had supported ISO 9001. |

ence (sociology, educational sciences), where researchers have already revealed the importance of student-institution fit, and within this, the match between students and the cultural aspects of the institution concerning the academic performance of higher education students. Nonetheless, in this line of research the use of the culture diagnosis tools invented in the management literature are rarely employed.

As Bowman and Denson (2014) stated, student-institution fit is an important but empirically under-researched area of higher education studies. They could only find a

few studies focusing on this question, and we also only came across one study published after 2014, by Sommet et al. (2015). Bowman and Denson (2014) revealed six factors, and found that a better fit leads to greater college satisfaction, lower social isolation, and indirectly to a stronger intention to persist with studies. Although the various factors (religious, athletic, academic, socio-economic, political, social) do not echo any OC model, they are all strongly connected to cultural aspects.

Sommet et al. (2015) are more explicit in stating that

in addition to economic and social factors, psychological reasons might also be responsible for lower student–institution fit and, through this, also for weaker achievement. They also pointed out that papers measuring the contribution of Bourdieu’s ‘social capital’ to students’ achievement may also support the idea that cultural factors play an important role in one’s academic performance, referring to the works by Stephens et al. (2012), Stephens, Townsend, Markus, and Phillips (2012), and Stephens, Hamedani, and Destin (2014).

The papers mentioned above measured cultural mismatch as the lack of a fit between the ‘cultural models of self’, brought from the family and the pre-higher education background, and the models of self that are prevalent in the college culture, focusing on the dichotomy of interdependent-independent norms. In their examination students’ achievement variables are cortisol level, various psychosocial outcomes, and end-of-year grade point averages. The evidence they found shows a significant positive relationship between cultural fitness and the academic outcomes measured.

In sum, the findings of Bowman and Denson (2014), as well as those of Sommet et al. (2015) can support the idea that our research question is grounded and that we can hypothesize the existence of a positive relationship between the student-institution fit and the students’ academic achievement. The study by Stephens et al. (2014) is, however, closest to the present research.

The core difference is that the current study uses a managerial perspective on OC, and with this comes the use of the OCAI model, as a widely used, easy to administer diagnostic tool. Thus, the hypothesis for the empirical examination is formulated as follows:

The further a student feels the culture of their faculty (perceived culture) falls from its ideal state (preferred culture) the weaker the same student’s academic performance is.

Method and Data

To reveal the OC the students perceived and preferred at their faculty we employed a version of the OC Assessment Instrument (OCAI) questionnaire published by Cameron and Quinn (2006), translated into Hungarian and adapted for the target group. The six dimensions of the OCAI instrument have been briefly introduced in the literature review section of this paper. The main modification we made was the omission of the sixth dimension (‘Criteria of Success’), because after discussing the questionnaire with the master level students – who also conducted the data collection – we found it irrelevant: the respondents simply lack the necessary information on this item. Other changes affected only the wording: again, with the help of our students we adapted it to the situation, viewpoint, and knowledge level of a bachelor student.

As the literature review in the previous section showed, the management literature about the relationship between OC and performance in HEIs investigated the average perceived and/or preferred culture on the institutional

level. Contrarily, in the present study the unit of analysis is the individual student. Thus, it examines the connection between individual students’ cultural fit (according to their own perception) and their grade average. For this analysis neither the average institutional culture nor the average preferred culture is important, only the difference between the individual’s perception of, and preference for, the organizational culture.

Distance between the preferred and the perceived cultures will be measured both (1) as the absolute value of the difference between the student-assigned preferred and the perceived values along each of the four cultures of the Competing Values Framework (thus there will be four differences for clan, adhocracy, market and hierarchy cultures) and (2) as the minimum, mean and maximum of these four absolute values.

According to our hypothesis, we expect that the greater the absolute value of the cultural mismatch (the difference between the faculty culture types its students prefer and the ones they perceive) the lower the students’ academic performance.

We gathered some additional data via the questionnaire about the respondents’ background, as well. In the further part of our study we will use the following elements of this information: the respondent’s major(s), the semester they started their university studies in, their sex, year of birth, place of residence (name of the settlement), highest level of schooling, whether or not they have a job while engaged in their university studies, and the percentage of the university seminars and lectures they attend in the semester of the survey (measured by five categories: 0%, 1-20%, 21-40%, 41-60%, 61-80%, 81-100%). This background information is used only to provide a context to the investigation of the relationship between individual cultural fit and individual student performance in higher education. Thus, we do not intend to draw conclusions on the role of the background variables, but we will use them as control variables in multivariable regression analysis.

The questionnaire survey was conducted at the University of Debrecen, Hungary. This higher educational institution has a long tradition going back over more than 450 years (UD, 2018). Its predecessor, the Reformed College of Debrecen, was established in 1538. Later in 1912 the Hungarian Parliament established the Hungarian Royal University of Debrecen with five faculties. After the Second World War the university was disintegrated into three institutions. The Faculty of Theology was separated and returned to the Calvinist Church (as Debrecen Reformed Theological Academy that was the predecessor of the current Debrecen Reformed Theological University), the Faculty of Law was suspended, and the Medical University of Debrecen and the Lajos Kossuth University began their independent operation. From the beginning of 1980s the idea of reunification was already under discussion, but the merger took place only on January 1, 2000. Currently the University of Debrecen, where our research took place, has more than 25000 students at 14 faculties. In addition to its Hungarian programmes the university offers 51 programmes in foreign languages.

Our data were collected from students studying on eight majors at four faculties at the University of Debrecen, Hungary. Students of the Faculty of Economics and Business (FEB), the Faculty of Engineering (FE), and the Faculty of Informatics (FI) were surveyed during November 2015 (the data collection was conducted by master students), while students from the Faculty of Science and Technology (FST) filled in the questionnaires (collected by instructors) during December in the same year. Everyone in the sample studied at the bachelor level, on one of the following majors. FEB students: Business Economics and Management (BEM); FI students: Engineering Information Technology (EIT) or Software Information Technology (SIT); FE students: Technical Management (TM); FST students: Biology (BIO), Geography (GEG), Geology (GEL), or Chemistry (CHE).

The nominal performance of the students was very likely biased by the different courses they had to complete. Since course-sets depend on the major and also on the year, we have standardized the reported performance by the respondent's major and the semester in which he/she started his/her university studies, in order to minimize this bias. To further refine our dataset we have omitted from the sample those who belonged to a combination of major and starting semester where the number of students was lower than 9, who had already graduated at bachelor level, who had more than one major, and also those who visited less than 21% of the classes (5 people). Given these constraints, the structure of the final sample by faculty, major, sex and starting semester is presented in *Table 2* and the unstandardized student performance is shown in *Table 3* by major and semester of enrolment. Variance analyses (one-way ANOVA) were conducted to reveal the significance of the potential grade bias by the major (see the last column of *Table 3*) and by the semester of enrolment (bottom row of *Table 3*); and only the major-bias was demonstrated to be significant in the fall semester of the starting year 2014.

Table 2.

Structure of the sample by faculty, major, sex and starting semester

| Faculty | Major | Starting semester | | | | | | Total |
|---------|-------|-------------------|--------|-----------|--------|-----------|--------|-------|
| | | Fall 2012 | | Fall 2013 | | Fall 2014 | | |
| | | Male | Female | Male | Female | Male | Female | |
| FEB | BEM | 0 | 0 | 14 | 25 | 19 | 39 | 97 |
| FI | EIT | 14 | 2 | 15 | 1 | 12 | 0 | 44 |
| | SIT | 0 | 0 | 10 | 2 | 13 | 0 | 25 |
| FE | TM | 0 | 0 | 27 | 19 | 27 | 18 | 91 |
| | BIO | 0 | 0 | 0 | 0 | 16 | 36 | 52 |
| FST | GEG | 0 | 0 | 0 | 0 | 7 | 11 | 18 |
| | GEL | 0 | 0 | 0 | 0 | 5 | 4 | 9 |
| | CHE | 0 | 0 | 0 | 0 | 6 | 6 | 12 |
| Total | | 14 | 2 | 66 | 47 | 105 | 114 | 348 |

Table 3.

Unstandardized grade-means by major and starting semester

| Semester | BEM | Major | | | | | | | | F | |
|--------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | | EIT | SIT | TM | BIO | GEG | GEL | CHE | Total | | |
| 2012 Fall | M | – | 3.375 | – | – | – | – | – | – | 3.375 | |
| | S.D. | – | 0.719 | – | – | – | – | – | – | 0.719 | |
| | N | – | 16 | – | – | – | – | – | – | 16 | |
| 2013 Fall | M | 3.308 | 3.313 | 3.083 | 3.261 | – | – | – | – | 3.265 | 0.488 |
| | S.D. | 0.569 | 0.704 | 0.515 | 0.575 | – | – | – | – | 0.583 | |
| | N | 39 | 16 | 12 | 46 | – | – | – | – | 113 | |
| 2014 Fall | M | 3.491 | 3.500 | 2.846 | 3.322 | 3.558 | 3.556 | 3.333 | 3.333 | 3.425 | 1.986* |
| | S.D. | 0.716 | 0.674 | 0.689 | 0.792 | 0.608 | 0.705 | 0.500 | 0.492 | 0.697 | |
| | N | 58 | 12 | 13 | 45 | 52 | 18 | 9 | 12 | 219 | |
| F | | 1.799 | 0.248 | 0.938 | 0.180 | | | | | 2.146 | |

Note: M = mean; S.D. = standard deviation, F = ANOVA F statistic, * $p < 0.10$

To identify whether and how cultural fit and grade performance are connected statistically, we first identify linear correlations and rank correlations between the – signed and absolute – values of cultural mismatch (measured as the differences between preferred and perceived cultures) and the standardized self-reported average grade of the students. The findings will be reinforced with multivariate linear regression analysis where the relationships are tested in the presence of other available independent variables (sex, age, habitation, secondary school type, self-reported class attendance rate, being employed or not). During these investigations the variables defined in *Table 4* will be used.

Table 4.

Definitions of the variables

| Name | Definition |
|-------|--|
| SEX | 0 if the respondent is male, 1 if female |
| AGE | The respondent's age estimated as the difference between the survey date and the middle (1st July) of the year of birth. |
| LOCAL | 0 if the respondent's place of residence is not in the university's city, 1 if it is. |
| VOCED | 0 if the respondent's highest completed education level is academic secondary school, 1 if it is vocational secondary school. |
| ATT41 | 0 if the student reported minimum attendance rate on seminars and lectures in the current semester as a maximum of 40% on average, 1 if the average attendance rate is a minimum of 41%. |
| ATT61 | 0 if the minimum attendance rate is reported to be less than 61% (in the current semester, on average), 1 if it is equal or higher. |
| ATT81 | 0 if the minimum attendance rate is reported to be less than 81% (in the current semester, on average), 1 if it is equal or higher. |
| JOB | 0 if the respondent has no job while engaged on his/her university studies, 1 if he/she has. |
| PERF | The self-reported average grade performance in the previous semester(s) rounded to a single digit from 1 to 5. |
| ZPERF | PERF standardized by major and starting year. |
| CLAN | The degree to which the OC of the faculty is perceived by the respondent to be a clan culture. Ranging from 0 to 100. |
| ADHO | The degree to which the OC of the faculty is perceived by the respondent to be an adhocracy culture. From 0 to 100. |
| MARK | The degree to which the OC of the faculty is perceived by the respondent to be a market culture. 0-100. |

| | |
|----------|---|
| HIER | The degree to which the OC of the faculty is perceived by the respondent to be a hierarchy. 0-100. |
| pCLAN | The degree to which the respondent would prefer a clan culture as the OC of its faculty. From 0 to 100. |
| pADHO | The degree to which the respondent would prefer an adhocracy as the OC of its faculty. 0-100. |
| pMARK | The degree to which the respondent would prefer a market culture as the OC of its faculty. 0-100. |
| pHIER | The degree to which the respondent would prefer a hierarchy as the OC of its faculty. 0-100. |
| DIFclan | The degree to which the respondent would like its faculty's culture to be a clan compared to its current state. Equals pCLAN minus CLAN. |
| DIFadho | Equals pADHO minus ADHO. |
| DIFmark | Equals pMARK minus MARK. |
| DIFhier | Equals pHIER minus HIER. |
| ADIFclan | The degree to which the preferred and the perceived clan cultures on the faculty differ from each other, according to the respondent, independently of the direction of the difference. Equals the absolute value of DIFclan. |
| ADIFadho | Equals the absolute value of DIFadho. |
| ADIFmark | Equals the absolute value of DIFmark. |
| ADIFhier | Equals the absolute value of DIFhier. |
| minADIF | The smallest difference, in absolute value, between the preferred and perceived culture in any of the four culture types. Equals the minimum of ADIFclan, ADIFadho, ADIFmark and ADIFhier. |
| aveADIF | Equals the mean of ADIFclan, ADIFadho, ADIFmark and ADIFhier. |
| maxADIF | Equals the maximum of ADIFclan, ADIFadho, ADIFmark and ADIFhier. |

In the total sample the average estimated age (AGE) was 21.166 years (standard deviation is 1.546 years, the number of missing responses is 2), the number of those living in the university city (LOCAL) was 101 (with 9 missing answers), the highest educational level was secondary vocational school (VOCED) in 118 cases and secondary academic school in the remaining 230 cases. 142 people were employed at the time of the survey (JOB). Of the 348 respondents everyone reported a minimum 21% attendance rate. 312 of them were present at least 41% (ATT41), 235 at least 61% (ATT61), and 102 at more than 80% (ATT81) of the classes in the semester when the survey was conducted.

Results

To create a context for the examination of the core research questions, we first describe the OCs of the eight majors according to the four culture types of the Competing Values Framework (CVF). In Table 5 data on the means and standard deviations of the average scores assigned to the perceived and preferred cultures by the respondents are presented, along with one-sample *t*-statistics measuring the significance of the difference of the mean cultural values from the value of a neutral culture (i.e. 25, if the 100 points are randomly distributed among the four culture types). In 33 of the 64 cases (two times four culture types in eight majors), i.e. in approximately half of the tests we had run, the mean of the assigned scores were different from the 'neutral' value at the 5% level of significance.

To investigate the cultural diversity among the eight majors, ANOVA tests were also conducted along every perceived and preferred culture type. Majors were found to be different from each other in every case on at least the 5% significance level, without exception. Not wanting to duplicate the information already present in Table 5 we mention only one example to show how to understand these data. Regarding BEM students, the data indicates that they sensed a weak clan (significantly lower than 25), weak adhocracy (significantly lower than 25), strong market (significantly higher than 25) and strong hierarchy culture (significantly higher than 25), while the same respondents revealed that their ideal culture was a strong clan (significantly higher than 25) and strong hierarchy (significantly higher than 25), an average adhocracy (does not differ significantly from 25), and a weak market culture (significantly lower than 25).

Table 5. Perceived and preferred cultures by major

| Type BEM N = 97 | | FEB | FI | | | FE | FST | | | F |
|--------------------|------|-----------|-----------|----------|-----------|-----------|-----------|--------|-----------|----------|
| | | EIT | SIT | TM | BIO | GEG | GEL | CHE | | |
| | | N = 44 | N = 25 | N = 91 | N = 52 | N = 18 | N = 9 | N = 12 | | |
| CLAN | Mean | 22.522 | 19.275 | 23.200 | 27.440 | 25.219 | 31.722 | 23.333 | 25.333 | 8.601*** |
| | S.D. | 7.291 | 6.783 | 6.819 | 7.213 | 7.123 | 11.488 | 9.579 | 8.117 | |
| | t | -3.347*** | -5.598*** | -1.320 | 3.226*** | 0.222 | 2.483** | -0.522 | 0.142 | |
| ADHO | Mean | 23.464 | 21.289 | 22.440 | 25.602 | 24.700 | 23.500 | 21.222 | 23.500 | 2.778*** |
| | S.D. | 6.078 | 8.485 | 6.378 | 4.690 | 5.730 | 5.732 | 7.480 | 7.205 | |
| | t | -2.489** | -2.901** | -2.007 | 1.225 | -0.378 | -1.110 | -1.515 | -0.721 | |
| MARK | Mean | 26.680 | 30.193 | 29.960 | 22.969 | 23.977 | 19.611 | 25.556 | 26.833 | 6.010*** |
| | S.D. | 8.033 | 10.062 | 11.081 | 6.724 | 7.229 | 7.204 | 12.875 | 11.216 | |
| | t | 2.060** | 3.423*** | 2.238** | -2.881*** | -1.021 | -3.174*** | 0.129 | 0.566 | |
| HIER | Mean | 27.334 | 29.243 | 24.400 | 23.989 | 26.104 | 25.167 | 29.889 | 24.333 | 3.495*** |
| | S.D. | 8.104 | 9.501 | 8.010 | 4.387 | 5.880 | 8.900 | 6.791 | 5.331 | |
| | t | 2.836*** | 2.962*** | -3.75 | -2.198** | 1.354 | 0.079 | 2.160* | -0.433 | |
| pCLAN | Mean | 27.920 | 27.845 | 26.968 | 27.435 | 31.192 | 35.056 | 28.778 | 30.583 | 4.256*** |
| | S.D. | 7.199 | 7.853 | 4.228 | 5.977 | 7.027 | 9.613 | 7.085 | 4.907 | |
| | t | 3.995*** | 2.403** | 2.327** | 3.886*** | 6.355*** | 4.438*** | 1.600 | 3.941*** | |
| pADHO | Mean | 24.374 | 26.505 | 26.760 | 25.963 | 26.650 | 24.556 | 23.667 | 26.167 | 2.623** |
| | S.D. | 4.440 | 4.607 | 4.608 | 4.004 | 3.792 | 5.147 | 3.202 | 5.271 | |
| | t | -1.389 | 2.167** | 1.910* | 2.293** | 3.138** | -0.366 | -1.249 | 0.767 | |
| pMARK | Mean | 21.379 | 22.909 | 22.472 | 22.066 | 17.892 | 17.333 | 22.444 | 19.000 | 4.281*** |
| | S.D. | 6.142 | 6.700 | 5.178 | 5.944 | 5.343 | 5.111 | 12.660 | 6.045 | |
| | t | -5.807*** | -2.070** | -2.441** | -4.709*** | -9.593*** | -6.365*** | -0.606 | -3.438*** | |
| pHIER | Mean | 26.328 | 22.741 | 23.800 | 24.536 | 24.265 | 23.056 | 25.111 | 24.250 | 3.042*** |
| | S.D. | 5.219 | 4.713 | 4.186 | 4.388 | 4.988 | 6.412 | 5.667 | 4.181 | |
| | t | 2.506** | -3.180*** | -1.433 | -1.008 | -1.062 | -1.287 | 0.059 | -0.621 | |

Note: S.D. = standard deviation, t = one-sample t-test (test value is zero), F = ANOVA F statistic, * p < 0.10, ** p < 0.05, *** p < 0.01.

After identifying the various cultures perceived or preferred by the students on different majors we also tested whether there is a gap between the preferred and perceived cultures (measured via variables whose names begin with 'ADIF', described in Table 4) on the level of individual students, and if the size of these gaps is statistically connected to the students' (self-reported) performance or not. Since the performance of students from different majors could not be compared without a significant bias (because tests, teachers, required skill and many other things are

different) we will conduct the analysis only on the individual level, employing the standardized version (by major and by year) of the self-reported performance (ZPERF, see Table 4). Table 6 reports the results of one-sample *t*-tests, comparing the mean of ZPERF to the test value zero. Because it is trivial to assume that those visiting more classes sense OC differently from those not present as frequently during the course (and they would probably be familiar with a different type of culture, too) we conduct the testing on the basis of minimum attendance rate. Here we would like to note that attendance rate can naturally affect the preferred and perceived cultures presented in Table 5 as well, but since it is not directly necessary to answer our main questions, and since the sample size would be too small in the majority of the attendance rate vs. major combinations, we skip the analysis of the impact of attendance on culture at the major level. Although the questionnaire asked the students in relation to their faculty, this would still not be a good level of aggregation, because the respondents were recruited only from 1 to 4 majors of each faculty, so it would be far from representative.

The results in Table 6 show that preferred and perceived cultures differ significantly in the whole sample on the individual level (we did not take the major or the faculty into consideration) at every attendance rate. In the last column of the table *F*-test results are shown, which test the connection between minimum attendance level and (signed and absolute) cultural mismatch: this is not significant at the 5% level for any of the culture types.

Table 6.
Significance test of cultural mismatch
by attendance rate

| Culture type | One-sample <i>t</i> -tests (test value = 0) | | | | <i>F</i> |
|--------------|---|-----------|-----------|-----------|----------|
| | Subsamples by minimum attendance | | | | |
| | 21% | 41% | 61% | 81% | |
| DIFclan | 10.188*** | 9.558*** | 7.418*** | 5.234*** | 1.319 |
| DIFadho | 5.078*** | 4.754*** | 4.435*** | 1.902* | 0.715 |
| DIFmark | -9.171*** | -8.784*** | -7.431*** | -4.982*** | 0.044 |
| DIFhier | -3.672*** | -3.224*** | -1.950* | -0.286 | 1.821 |
| ADIFclan | 19.336*** | 19.311*** | 16.211*** | 9.962*** | 2.253* |
| ADIFadho | 18.670*** | 17.683*** | 15.618*** | 10.050*** | 0.736 |
| ADIFmark | 16.981*** | 16.247*** | 14.216*** | 8.781*** | 0.831 |
| ADIFhier | 17.955*** | 17.536*** | 15.109*** | 9.595*** | 0.817 |
| <i>N</i> | 348 | 312 | 235 | 102 | |

Note: *F* = ANOVA *F* statistic, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

We also know from the same table, that the means of the signed differences are different from zero, too – with the only exception being hierarchy culture in the subsample of students with class attendance above 60% –, which means that the cultural mismatch has a direction: students tend to perceive the present clan and adhocracy cultures to be weaker, while the market and (only in the samples with a minimum 21 or 41% attendance) hierarchy cultures to be stronger than preferred.

Now that the presence of gaps in the students' cultural fit is supported, we can investigate their relationship to the standardized (self-reported) performance. First, let us see what linear and rank correlation analyses show (see Table 7), not taking the possible moderator variables into consideration.

Table 7.
Linear and rank correlations between the
standardized performance (ZPERF) and the variables
of cultural fit

| Cultural variable | Pearson correlation by min. attendance | | | | Spearman's rho by min. attendance | | | |
|-------------------|--|----------|-----------|-----------|-----------------------------------|----------|-----------|----------|
| | 21% | 41% | 61% | 81% | 21% | 41% | 61% | 81% |
| | <i>N</i> | 348 | 312 | 235 | 102 | 348 | 312 | 235 |
| DIFclan | 0.018 | 0.012 | 0.013 | 0.039 | -0.039 | -0.049 | -0.041 | 0.021 |
| DIFadho | -0.039 | -0.053 | -0.101 | -0.045 | -0.026 | -0.028 | -0.093 | -0.112 |
| DIFmark | 0.026 | 0.033 | 0.064 | 0.012 | 0.080 | 0.091 | 0.128** | 0.064 |
| DIFhier | -0.015 | -0.007 | -0.007 | -0.009 | 0.015 | 0.023 | 0.005 | -0.060 |
| ADIFclan | -0.034 | -0.051 | -0.086 | -0.077 | -0.072 | -0.087 | -0.128** | -0.125 |
| ADIFadho | -0.054 | -0.052 | -0.121 | -0.209** | -0.032 | -0.023 | -0.091 | -0.183* |
| ADIFmark | -0.025 | -0.036 | -0.105 | -0.165* | -0.020 | -0.040 | -0.119* | -0.146 |
| ADIFhier | -0.115** | -0.132** | -0.206*** | -0.267*** | -0.104* | -0.111** | -0.185*** | -0.195** |
| minADIF | -0.051 | -0.059 | -0.126* | -0.173* | -0.074 | -0.071 | -0.110* | -0.133 |
| aveADIF | -0.074 | -0.088 | -0.177*** | -0.236** | -0.082 | -0.098* | -0.186*** | -0.245** |
| maxADIF | -0.066 | -0.078 | -0.156** | -0.207** | -0.067 | -0.083 | -0.177*** | -0.224** |

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in Table 7 support the hypothesis that there is a positive connection between cultural fit and academic performance. In the table it is represented as the negative correlations and rank correlations between the absolute values of the differences between the preferred or perceived culture and the standardized self-reported average grade performance (aveADIF). However, the relationship is very weak (between -0.18 and -0.25), and the average and maximum absolute difference shows a significant connection with the performance only in the subsamples of those respondents who reported a minimum 61% and 81% attendance rate at the classes. The role of a relatively high attendance seems to be reasonable, since those who are not present at the majority of the lessons may not be able to estimate the culture appropriately and/or may not be motivated to get good grades; thus the measurement may be heavily biased in their case.

Nevertheless, mismatch in the hierarchy type presents a significant negative correlation in all samples, and a significant negative rank correlation for all but the sample of the minimum 21% attendance. Thus, its relationship with the performance is significant even when that of the average and maximum values are not. The fit of the other culture types shows no consistent statistically significant linear or rank correlation with the performance (ADIFadho and ADIFclan are significant in only one case each, and even in these cases the linear and rank correlations do not support each other). Still, it is supportive for our hypothesis that the coefficients – significant or not – are negative in every case without exception.

The relationships between the signed variances of the preferred/perceived culture types and the performance did not produce any consistent pattern (the only significant connection is the rank correlation between the DIFmark and the performance in the case of the minimum 61%

attendance).

In sum, our results support the assumption that if the preferred and perceived cultures are closer to each other, especially in the case of hierarchy, the average grades are expected to increase (the connection is weak). We have to note, however, that correlation analysis says nothing about causality; thus we cannot tell whether the cultural fit helps the students to get better grades, or students with better grades tend to feel the culture to be a better fit for them.

Next, we employ linear regression analysis to test the above findings in the presence of some demographic variables available from the survey (sex, age, habitation, secondary school type, self-reported class attendance rate, being employed or not). We will investigate only those variables of cultural fit that were found to be significant above, i.e. absolute differences of the four culture types (we expect that only hierarchy will be significant) and the average absolute difference (this showed a stronger relationship than the minimum or maximum absolute difference). In both cases only the constant and the independent variables with significant contributions are included in the models. We start with the average absolute difference as the main independent variable; see *Table 8* for the results.

Table 8.
Linear regression analysis with average absolute cultural difference

| Dependent variable | Subsample by minimum attendance rate | | | |
|--------------------|--------------------------------------|-----------------------|-----------------------|----------------------|
| | min. 21% | min. 41% | min. 61% | min. 81% |
| | ZPERF | ZPERF | ZPERF | ZPERF |
| Constant | 0.027 (0.367) | 0.054 (0.703) | 0.368 (2.952***) | 0.703 (4.202***) |
| SEX | - | - | 0.253 (2.097**) | - |
| AGE | - | - | - | - |
| LOCAL | - | - | - | - |
| VOCED | -0.343 (-3.143***) | -0.339 (-2.961***) | -0.470 (-3.654***) | -0.520 (-2.500**) |
| ATT41 | - | - | - | - |
| ATT61 | - | - | - | - |
| ATT81 | 0.314 (2.771***) | 0.286 (2.482**) | - | - |
| JOB | - | - | - | - |
| aveADIF | - | - | -0.039 (-2.774***) | -0.058 (-2.578**) |
| F | 9.217***) | 7.798***) | 8.404***) | 6.217***) |
| adjR ² | 0.045 | 0.042 | 0.087 | 0.094 |
| N | 348 | 312 | 235 | 102 |

Note: *F* = ANOVA *F* statistic, *adjR*² is the variance explained (unbiased), *t*-statistics are in parentheses, * *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01.

The results presented in *Table 8* support the inferences drawn from the linear and rank correlation analyses: among students who attend more than 60% of the classes there is a significant, negative relationship between cultural non-fit (aveADIF) and academic performance (ZPERF), even when sex, age, habitation, secondary school type, class attendance rate, and employment during university

are taken into consideration. The explanatory power of the regression models are very weak (adjusted *R*² < 0.1), thus this is certainly not among the main factors affecting students' success at the university. However, the hypothesized connection is supported.

Lower levels of class attendance aveADIF did not contribute significantly to the models (instead, the dummy variable of attendance above 80% was significant). From these results we can assume that cultural fit becomes important only when an appropriate level of attendance is already given. Until then, the effect of attendance suppresses it.

Now, let us consider the test for the contribution of cultural fit in separate culture types (instead of the average cultural fit tested above) to the students' performance (see *Table 9*).

Table 9.
Linear regression analysis with absolute differences in the four culture types

| Dependent variable | Subsample by minimum attendance rate | | | |
|--------------------|--------------------------------------|-----------------------|-----------------------|-----------------------|
| | min. 21% | min. 41% | min. 61% | min. 81% |
| | ZPERF | ZPERF | ZPERF | ZPERF |
| Constant | 0.121 (1.387) | 0.163 (1.767*) | 0.299 (2.747***) | 0.618 (4.310***) |
| SEX | - | - | 0.238* (1.965) | - |
| AGE | - | - | - | - |
| LOCAL | - | - | - | - |
| VOCED | -0.332 (-3.050***) | -0.322 (-2.815***) | -0.431 (-3.336***) | -0.458 (-2.203**) |
| ATT41 | - | - | - | - |
| ATT61 | - | - | - | - |
| ATT81 | 0.307 (2.715***) | 0.281 (2.451**) | - | - |
| JOB | - | - | - | - |
| ADIFclan | - | - | - | - |
| ADIFadho | - | - | - | - |
| ADIFmark | - | - | - | - |
| ADIFhier | -0.018 (-1.932*) | -0.021 (-2.113**) | -0.031 (-2.796***) | -0.047 (-2.650***) |
| F | 7.438***) | 6.746***) | 8.448***) | 6.415***) |
| adjR ² | 0.053 | 0.053 | 0.087 | 0.097 |
| N | 348 | 312 | 235 | 102 |

Note: *F* = ANOVA *F* statistic, *adjR*² is the variance explained (unbiased), *t*-statistics are in parentheses, * *p* < 0.10, ** *p* < 0.05, *** *p* < 0.01.

The regression models of *Table 9* generally support the previous findings. Among students with attendance rates above 40%, 60%, and 80% the absolute difference between the preferred and perceived hierarchy culture contributes significantly to the explanation of the standardized grades. However, in the sample with 21% minimum attendance, it is significant only at the 10% level. In all these cases the coefficient on ADIFhier is negative, thus a greater difference leads to a weaker student performance in the regression models (deductively, a better cultural fit leads to a stronger performance). None of the other three culture types' mis-

match showed a significant effect on the dependent variable.

Conclusion and Discussion

This paper has discussed the connection between cultural fit and the academic performance of higher education students. Cultural fit was estimated inversely as the absolute value of the difference between preferred and perceived culture measured by OCAI questionnaires filled in by students from the University of Debrecen, Hungary. The academic performance was estimated based on the surveyed students' self-reported average grade standardized by their major and semester of enrolment.

By using different statistical methods (linear correlation analysis, rank correlation analysis, linear regression analysis) the above connection was found to be significant in the case of hierarchy culture and the average of the cultural mismatches of the four culture types. In addition, the maximum mismatch was also supported to be linearly correlated, as well as rank correlated to the standardized grade performance; however, this was not tested with linear regression analysis.

The above mentioned statistical relationships were present only if the subsample of those students who visited the majority of the classes was analyzed (in the case of hierarchy culture to have visited at least 40% of the classes was sufficient).

Based on the results reported above we can conclude that the answer to the research question is: yes, higher education students' cultural fit tends to relate positively to their academic performance. In other words, the related hypothesis is supported, as well as the results of previous educational science research (e.g. Sommet et al., 2015; Bowman – Denson, 2014; Stephens et al., 2014). The main contribution of this paper is the introduction of a new methodology to this area: we have applied a culture diagnostic concept (CVF) and a tool (OCAI) that had been developed in the managerial sciences. Using OCAI for the measurement of cultural fit instead of simply the perceived and/or preferred culture and examining its relationship with student performance is also a novelty in the managerial OC literature about HEIs.

To suitably evaluate the findings, we should make some additional comments. First, the applied methods could not reveal causal directions. Thus, it is equally possible that the cultural fit contributes to academic success, that being more successful in one's studies makes the student like the given organizational culture more, or there can also be an unidentified common cause behind both stronger cultural fitness and better study grades. Any combination of these interpretations is also possible.

Second, and strongly connected to the first point, a clear advice on managerial responses cannot be given at this stage. In other words, the research conclusions are not normative. Even if we accept that a stronger culture–person fit could increase the organizational performance (in the actual study: grade averages) it is still only one component in a very complex system of variables. It should be taken into consideration, but other factors (the motivating

effect of the culture type in itself, students' background, skills and abilities, etc.) could be at least as important. For example, based on the combined facts that the average student seems to prefer a weaker hierarchy culture (as we can see in *Table 6*) and that a better fit between the preferred and perceived levels of hierarchy culture is connected to a higher performance (*Table 7*) we should not automatically conclude that the institution should lower the level of its hierarchy culture. A stronger hierarchy culture could have benefits that were not tested in our paper. The management might find it more appropriate – mentioning only two examples – to help their students accept the given cultural features, or to involve information about its culture in its recruitment activities to attract those whose will find the existing culture acceptable.

Third, the connection between cultural fit and performance was present only for those students who were present at more than 40% of the classes. In other words, cultural fit could influence only those who have enough opportunity to perceive it. During online or correspondence education programs we can expect the relationship to be weaker or not to exist at all.

Naturally, some limitations must be mentioned along with the findings. First, the sample included students from only one university. Other institutions, preferably with different national and/or professional cultural backgrounds, might provide different results. Second, we collected the information about the culture through adapted OCAI questionnaires. Examinations with other cultural models and measurement methods (from *Table 1* we can mention OCES, OCS, UES, and CCS) are needed to support our findings before we can conclude anything in general (the definition and diagnosis of organizational culture is still debated, see the literature review). Third, self-reported academic performance may be biased, thus more objective data would need to be analyzed to support or reject our conclusions.

In other words, the most trivial possible future research directions involve testing the findings of this paper through concentrating on its limitations using different samples, culture models and measurement methods, and more objective data about performance. Another interesting field for examinations could be to test the connections between individual cultural fitness and some additional performance measures. Important performance indicators of higher education institutions – among others – could be: graduation rate, graduate employability, retention (or dropout) rate, students' competition and research success.

Even with the limitations and considerations mentioned above, the results of this paper contribute to the literature in at least one important sense: they support the idea that cultural fit – as the students perceive it – can play a significant role in academic performance at higher education institutions, and managerial OC diagnosing tools could be an efficient help in managing this fit. Cultural management should be considered to be a part of the efforts made by higher education institutions to improve not only student satisfaction but also the output of their core operations.

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TRIPLE-BOTTOM-LINE IMPACT ANALYSIS FRAMEWORK OF FINTECH COMPANIES

Financial institutions play a crucial role in the market economy. Banks act as intermediaries between savers and borrowers, decreasing information asymmetry and enabling investment. They play a crucial part in society by offering financial services to people and enabling corporate investment. Traditional bricks-and-mortar banks cannot sufficiently financially include all people – they particularly fail to reach the Bottom-of-the-Pyramid (BoP). Newly emerging financial technology companies – fintechs – have already started to fill the gap by providing services to the BoP, enabled by information and communications technology (ICT) and new business models. The triple-bottom-line (TBL) impact analysis of fintechs is a new, emerging research area. This article fills the gap in current literature by providing a proposed analytical framework with which to assess fintechs from a TBL-value-creation perspective. The article presents the benefits of the TBL Impact Analysis Framework of Fintechs based on findings from more than hundred currently operating fintechs and existing sustainable banking initiatives. The framework contains the direct and indirect TBL value creation elements of fintechs organized along their economic, social and environmental impact and can be used as a simple, yet effective assessment tool for analyzing the TBL impact of fintechs, helping to make TBL-related adjustments, improving upon currently offered solutions, or aiding in the design of financial new products with TBL value-creation elements.

Keywords: business models (BM), bottom of the pyramid (BoP), fintech, financial inclusion, sustainable banking, TBL impact analysis framework, triple-bottom-line (TBL)

The Club of Rome published a warning almost 50 years ago in the *Limits to Growth* (1971) that economic growth would not necessarily result in an increase in the well-being and wealth of individuals. The term sustainable development (SD) was formalized in 1987 to describe the need for a more complex solution to balancing economic growth and environmental, ecological and social improvements (Hall – Daneke – Lenox, 2010; Charter et al., 2008). This was in response to the realization that the economic structure and distribution of wealth is not sustainable (van der Bergh, 2007). SD must include inter-organizational networks and societal systems (Lélé, 1991) in which cultural expectations and customer demand play an important role in incentivizing organizations to change their current way of doing business (Birkin et al., 2009). Sustainable development at the company level must rely on a combination of strategy making and daily activities to meet stakeholders' expectations, while protecting, sustaining and enhancing social and natural resources (IISD, 1992). Recognition of the need for this symbiosis between economic, political, social and other elements of a functioning ecosystem has been known about at least since 1934 (Schumpeter, 1934). The role of companies in SD is unquestionable. The UN 2030 Agenda for Sustainable Development highlights the need for the creation of an efficient and sustainable economy as a major focal point (Mika – Farkas, 2017); clearly an area where corporations need to engage.

Elkington (1997) frames corporate sustainability using the concept of the Triple-Bottom-Line, according to which a company's strategy relies on three pillars: economic, environmental, and social value creation. Sustainable organizations understand that they have obligations

toward their internal and external stakeholders, the people and planet when striving to make an economic profit. However, corporate sustainability has become a fashionable term, and companies often use SD rhetoric to improve their public image (Henderson, 2015). C-level executives are still having a hard time capturing the real benefits of triple-bottom-line perspectives. Research with 1.100 CEOs found no meaningful correlation between profit making and a positive return on social and environmental investment (Hansen et al., 2013).

Corporate sustainability requires systemic innovation (Boons et al., 2013) that goes beyond regular product and business development. Companies need to engage in a trial-and-error approach, versus the stage-gate trends of the 1980s and 1990s (Cooper, 1994). To be able to make such systemic change, different dimensions of society should be involved: markets systems, public policy and industrial norms, the relationship between the public and private sectors, integrating people at the BoP, and improving entrepreneurship (Fisac Garcia et al., 2013; Ashoka, 2010). Stakeholder relationships play a crucial role as well (Perrini – Tencati, 2006). What makes innovation pro-sustainable is disputed. Two streams of literature can be identified: i) innovation designed to reduce the environmental impact of economic activities, and ii) any innovation that reduces environmental load, independent of the original goal of the innovation (Zilahy – Széchy, 2012).

The growing area of business model (BM) research shows that BMs can be among the most effective tools for creating systemic change (Doganova – Eyquem-Renault, 2009; Yip – Bocken, 2018; Bocken et al., 2014). A BM describes how an organization creates, delivers and capture value (Osterwalder – Pigneur, 2010). BM describe the

mechanism of value creation which needs to be aligned with the strategy of the organization (Móricz, 2007), and defines a series of activities that use the resources, partners, and assets of the corporation to establish and keep a competitive advantage (Chesbrough, 2007; Horváth – Móricz – Szabó, 2018). The sharing economy and industrial symbiosis are two examples of new business models whereby organizations can make a profit while significantly reducing industry's social and environmental footprint (Zilahy, 2016). Another example of new BM is Creating Shared Value (CSV). CSV motivates corporations to create alternative means of making a profit by solving environmentally important problems (Porter – Kramer, 2011).

The business opportunity to improve the financial inclusion of the currently non-or underbanked population and the TBL concept represent a new set of business models in the financial sector. Since Prahalad drew attention to the significant economic group of almost four billion people living below 3,000 USD capita/year – what he called the Bottom-of-the Pyramid – many new businesses and startup companies have emerged to offer services to this low-income, but populous economic group. The future economic potential of this group may be significant, but companies that would like to be successful at offering the former their services need to adapt their current business models (Tate – Bals, 2016). Critics have remarked that Prahalad's approach to connecting the BoP and large multinational companies will not necessarily be beneficial, as multinationals are less focused on social concerns and empowering individuals at the BoP, and rather on trying to sell their products (Calton et al., 2013). This lack of both empathy and proximity to end users of multinationals has created a market niche in which smaller, more agile companies may have a business case. Fintechs have created viable business models to offer financial services to the BoP by using technology.

The goal of the present research is to fill the gap in the existing literature by offering an analytical framework for assessing fintechs from a TBL-value-creation perspective. The author collected, analyzed and ranked available literature on sustainable banking, business modeling, corporate sustainability and fintechs based on their relevance, explanatory power, and presented empirical research. Articles were also analyzed from a topic relevance perspective. During the research a well-defined, yet populous social group – the BoP was selected, as this group faces with the most critical economic, social and environmental issues, with limited access to financial services.

To create the proposed Triple-Bottom-Line Impact Analysis Framework of Fintech Companies the author carried out a desk research to find and analyze fintech companies that already have a working business model and hence impact on the BoP. More than hundred fintech companies were analyzed from publicly available information, including websites, press releases, and previous researches. Using the fintech business model categories of Lee and Shin, fintechs were grouped into domains. *Table 2* presents the results of the fintechs found in each domain. It was not the goal of the research to find or analyze all

available fintech companies – the number ranges in the thousands –, but to collect a large enough sample to identify common patterns with regard to the TBL approach. Insurtech companies – technology companies that provide insurance services – were not included in the current research to keep the focus on core banking related services, yet the author believes that the proposed framework will be beneficial to these companies too. The author also analyzed existing sustainability frameworks in order to assess the gaps between current recommendations targeting large banks and FIs.

Section 1 gives an overview of the relationship between SD and corporations. Section 2 focuses on the involvement and role of financial institutions in SD. Section 3 shows how newly emerging fintech companies are already providing services and increasing the financial inclusion of previously non- or underbanked populations by creating new business models and tailor-made services. Section 4 describes existing sustainable banking frameworks with a short description of each. Section 5 presents the proposed TBL Impact Analysis Framework for Fintechs. Section 6 concludes.

Sustainability in the financial sector

Financial institutions (FI), or more specifically, banks, have big impact on SD due to their intermediary role between savers and borrowers and also their role in financing economic projects, corporate innovation and investment. Banks have both a direct and indirect impact on SD. Internal or direct effects are easy to see: office buildings, bricks-and-mortar branches, paper use, waste management and energy consumption. External (or indirect) impacts can outweigh direct impacts, and include the criteria for project finance, new service and product development (Jeucken – Bouma, 2017), and social inclusion.

FIs are similar to other companies in pursuing innovation, as their survival depends on it. When companies integrate sustainability considerations (environmental, social and financial goals) into their idea generation, research and development (R&D) and commercialization activities, they are creating sustainable innovation. These innovations include products, services and technologies, as well as new business and organizational models (Charter et al., 2008). The company's mission is a critical element of its commitment to SD, as it has a cascading effect on its strategy, business models and executable business road-maps (Dees, 1998). Environmental and social considerations today are often lacking in strategy making, reaching only a local optimum with a focus on economic gain. Applying Porter's diamond model to FIs implies that banks can achieve a competitive advantage if they have a better understanding of their strategy and underlying structure, market and customer demand, factor conditions, and related and supporting industries than their competitors. A growing number of companies understand the increasing demand for social and environmentally conscious services and are making a strategic shift to integrate sustainability into their businesses (Neven – Droge,

2001). Companies, including FIs, are trying to rationalize their involvement in SD, but the relationship between TBL perspectives and financial return is complex. To succeed, organizations need to integrate the three building blocks of a pro-sustainability business case: i) they need to voluntarily participate in SD and understand the motives behind such initiatives, ii) the related business case must create positive, and observable economic benefits for the company, and iii) the company needs to embrace such business cases at the management level (Schaltegger – Lüdeke-Freund – Hansen, 2012). *Table 1* presents two approaches FIs can take in their strategic transformation when dealing with sustainability. Baumgartner and Ebner's framework is more generalized, yet can be applied to FIs as well, meanwhile Jeucken specifically examined FIs during its research. Meanwhile there are differences in the exact content in the phases, the overall findings are strongly correlated.

Table 1.
Four strategic phases of corporate sustainability transformation

| | Baumgartner – Ebner, 2010 | Jeucken, 2010 |
|----------------|---|---|
| Phase 1 | Introverted strategy, with focus on risk mitigation and meeting minimum legal compliance. | Defensive banking, where the bank only does the absolute minimum to meet regulatory expectations. |
| Phase 2 | Increasingly extroverted strategy, with improved external relationships and networks (e.g. NGOs) in sustainability. | Preventive banking, where the bank identifies cost-saving opportunities and implements measures within its own operations (e.g. reducing paper use, or energy consumption). |
| Phase 3 | Cleaner production with removing waste creation through the entire life-cycle. | Offensive banking, when the bank includes sustainability in its external marketplace and identifies viable business cases. |
| Phase 4 | Holistic corporate strategy wherein competitive advantage is derived from triple-bottom-line considerations. | Sustainable banking, when the bank streamlines all its operations and defines a clear strategy in promoting sustainable development. |

Source: Author's own table, based on Baumgartner – Ebner (2010) and Jeucken (2010)

The global financial crisis has drawn greater attention to FIs and made it apparent that most traditional banks have been overly focused on making economic gains but failed at social and environmental value creation and can be regarded as financial locusts. This failure of traditional banks has created a market niche for new business models. New financial services, product and asset classes have

emerged as philanthropic, high-net-worth individuals, institutional investors and social banks, alongside specialized intermediaries and investors, became more dominant. Social banks are an important part of sustainability as they connect socially minded investors with borrowers. Evidence shows that social banking can be good business: reciprocity involving the repayment of loans is greater, and the bank can leverage the trust and common values it shares with the communities it serves in its new product development and distribution processes. Social banks are also less subject to moral hazard and bank defaults (Cornee – Szafarz, 2013). As a result, sustainability in finance is globally expanding, and new service providers are gaining competitive advantages by understanding better geographical boundaries and topological attributes and incorporating these insights into their product and service development (Langley, 2018).

The Green Investment Incentive Scheme, the Environmental Council for the Banking Sector, and UNEP's declarations on banking and the environment are examples of the increased focus of Western economies on improving global financial inclusion and its role in social and environmental value creation. The Financial Initiative of the United Nations Environmental Programme (UNEP) is playing an important role in promoting sustainable banking. Sustainable banking involves all levels of the organization, and banks need to take proactive measures and discover their own business case when attempting to engage with SD. Banks must also frequently engage with their stakeholders and shareholders on the topic of SD. Areas that banks can consider making more sustainable include the composition of business portfolios, the innovation focus on new products, entering new market segments such as the BoP, introducing green sales and marketing, and moving towards sustainable value chain, sustainable operations, and risk management (UNEP Finance Initiative, 2016).

Banks have also improved their engagement is green and climate finance. Green and climate finance is defined in many ways, but in general refers to financial instruments or investments that finance the delivery of positive environmental projects. While a growing area, its impact is less than expected. In 2014, 361 billion USD was invested in climate finance, from which only 124 million USD came from the private sector. Green and climate finance would require 1.6 trillion USD a year of investment. Socially Responsible Investment (SRI), which is a broader category than green finance, has become a 2.4 trillion USD industry. SRI involves social investing, social screening, community investing and shareholder activism (Tulchin, 2003).

The International Finance Corporation estimates that there will be 23 trillion USD of climate investment opportunities between 2016-2030 (Clark – Reed – Sunderland, 2018). Current barriers in the sector to investment include information and financing gaps, short-termism, the undervaluation of natural capital, and the lack of voluntary financial commitments. Strong evidence of successful projects, monitoring, reports and the addressing of infor-

mation gaps is needed to help rationalize the benefits of green finance (Clark – Reed – Sunderland, 2018).

The birth of Microfinance Institutions (MFI) such as Grameen bank is a good example of successful business model innovation in the financial sector. A TBL-conscious financial business model must focus on the needs of local communities (Sinkovics – Sinkovics – Yamin, 2014). Sustainable value creation and delivery must include business processes, capabilities, and the stakeholder contribution (Morioka – Evans – de Carvalho, 2016). For the impacts of the MFI business model, Prof. Yunus, founder of Grameen, was awarded the Nobel Peace prize in 2006. MFIs have become widespread since their early days, with more than 3,300 institutions globally. Since its establishment in 1976, Grameen has grown into a group of 30 microfinance-related companies and organizations and has provided loans to 75 million people living at the BoP, 97% of whom are women (Yunus – Moingeon – Lehmann-Ortega, 2010).

The success of MFIs shows the demand for products that enable previously unbanked populations to access basic financial services. While MFIs are successful at providing a specific service – micro loans to previously unbanked –, there are also limitations to these products. First, a credit-driven service such as micro loans is not affordable to the poorest individuals who do not want to further burden themselves with debt or lack the business acumen needed to start even a micro business. MFIs are also dependent on external financing, and need to collect funds to distribute through their lending activities. MFIs need to repay their investors with profit, resulting in higher-than-market interest rates for their customers (Hammill – Matthew – McCarter, 2008). Nevertheless, microfinance and MFIs have been grown at an annual average rate of 30% over the past ten years to serve 66.7 million customers globally. Although MFIs are proof of the success of investing into the BoP, there is still an approximate funding gap of an order of magnitude. The annual cash demand in the sector is estimated to be 5 billion USD a year, compared to the current 500 million to 1 billion USD that is available.

The role of Fintechs in sustainability

“Fintech refers to non- or not fully regulated ventures whose goal is to develop novel, technology-enabled financial services with a value-added design that will transform traditional financial practices” (Varga, 2017) – or using a broader, more inclusive definition: “Fintech is a new financial industry that applies technology to improve financial activities” (Schueffel, 2016). This study uses the definition of Varga, as an overly broad definition makes it harder to distinguish Fintech from traditional banks – or large, multinational corporations. In theory, it would be possible to include banks or large companies in the present research, but this would make it harder to draw the line between traditional market participants and fintechs. This research has a focus on companies which are not regulated in terms of banking licenses, and tend towards what are

called startup companies with innovative, often disruptive business models. Although not multinational conglomerates, fintechs are not always under-resourced companies. More than 50 billion dollars were invested into the sector between 2010 and 2016 (Schueffel, 2016; Varga, 2017).

Fintechs are often described as companies that focus on the high digital literacy Y generation. Fintechs quickly became successful in areas such as payment and lending, fueled by the loss of faith in traditional banks and lack of credit on the market. Novel technologies such as blockchain offer the promise of improving remittance transfers and decreasing transfer and operating costs. Fintechs are already an important driver of new financial services in areas such as banking, insurance, asset management and financial education (Kerényi, 2017), and also in other strategic financial domains involving the development of new services and products such as payments systems, billing, personal finance, online and mobile banking, direct lending, P2P lending, money transfer and cryptocurrency transfer (KPMG, 2017).

The role of fintechs in providing financial service to formerly non- or underbanked populations is rarely mentioned, and nor was this the focus of research. The success of fintechs at serving the Y generation is apparent, but their impact from a TBL perspective may be even more significant from an economic and social perspective. There are numerous successful examples of how fintechs have been able to improve financial inclusion by offering financial services to groups and geographic areas where traditional banks have failed to do so. Fintechs aim to stay in close proximity to their end-users and to understand the real demands of local communities, which results in more tailor-made solutions. Fintechs gain a competitive advantage as they consciously and continuously adapt to the requirements of specific social groups, thereby improving their social scaling ability. Scaling of the social impact of fintechs can occur in two dimensions: 1) depth scaling: by increasing the fit of a product or service value proposition through more accurate and faster needs recognition and by mobilizing action about social and environmental issues, resulting in the creation of more adaptive products and services, 2) breadth scaling: by increasing the number of people with access to services, creating synergies and networks, and improving access to formerly unreached beneficiaries. Fintechs are using ICT as an enabler to foster both dimensions of social scaling, creating positive social value. Although economists agree that social value is hard to concretize, there is a consensus that such services improve way of life, culture, community, politics, environment, health and well-being, personal and property rights and aspirations (Mulgan, 2010; Vanclay, 2003; Fisac Garcia et al., 2013), helping people live life to its full potential (Yunus, 2007).

New services such as cell-phone-enabled payment solutions and remittance transfers are powerful examples of this. Today, the availability of services has become more important to users than who provides them. The financial deepening offered by fintechs can help diminish extreme poverty by providing usable and simplistic yet

affordable solutions to extreme users, such as those living at the BoP. Creating more efficient markets is critical from the perspective of SD and is among the eight Millennium Development Goals (Beck et al., 2011). Fintechs understand that companies need a servant leadership approach to be successful in this specialized market. The attributes of servant leadership are listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, sense of community, and commitment to the growth of employees (Gupta, 2013). Fintech appears to understand these concepts better than traditional banks and is able to redefine how one moves money from one point to another in emerging markets, where the velocity of money is currently very slow (Hughes – Lonie, 2007).

Understanding why some fintechs became successful and large banks fail is useful when creating a framework for a general assessment of TBL in fintechs. Nairobi is often called the FinTech hub of emerging markets, and the cradle for one of the most illustrious fintech ventures at the BoP, called M-Pesa. M-Pesa was among the first ventures to draw attention to the power of fintech and its TBL impact. M-Pesa is a payment solution to enable cash transfer via mobile phones between M-Pesa account holders. The service was launched in Kenya in 2007 by Safaricom, a Vodafone subsidiary company. The service were quickly growing with approximately 17 million accounts in 2012.

Some important and generalizable remarks can be made about the success factors of M-Pesa: 1) fintech's general target audience or customer segment may include a lower socio-economic demographic group than traditional financial institutions due to the lower costs of scaling via technology, 2) Kenya had over 90% mobile phone penetration by 2016, enabling rapid customer adoption, 3) Kenya's median population age is 19.5 years, while 60% of its inhabitants are under 25. It is thus one of the youngest countries in the world, 4) Kenya has a role as regional economic leader, hosting large technology companies such as Google, 5) The country's population has fast internet due to appropriate network infrastructure (Blythin-Hammond – Van Cooten, 2017). These findings show that the development of local market conditions and tailor-made fintech solutions must fit the environment – fintech alone cannot change a market if there is no support from the broader economy and technological enablers, such as mobile phone penetration or fast internet. One of the most important findings about the success of M-Pesa is their success with understanding local markets and creating a service that truly serves the local community. "First world" solutions have been ignored and field studies undertaken to understand local conditions (Hughes – Lonie, 2007). The marketing of services also needs to be changed, with messages such as thinking together, learning and doing, building social capital, building connectivity, integration, and illustrating with examples (Bharti et al., 2014).

Fintechs with TBL business models

From a business model perspective, fintechs can generally be categorized into one of the following six domains: pay-

ment, wealth management, crowdfunding, lending, capital markets, and insurance services (Lee – Shin, 2018).

Table 2.

Fintech companies and business models

| Business model | Name of Fintech |
|-------------------|--|
| Capital Markets | Abacus, Abra, Acorns, Kapitall, Lelapa Fund, Socure, Taqanu, WeSwap |
| Crowdfunding | GoFundMe |
| Lending | Aire.io, Avant, Bondora, Borrowell, Branch, CommonBond, Credit Karma, Earnest, GuiaBolso, Harmony, Tala, Kiva, Kreditech, Landbay, lantouzi.com, Lenddo, Lendify, LendingWorks, LendInvest, LendUp, Lendwithcare, Lufax.com, MaTontine, Mimoni, OnDeck, Payoff, Peerform, Progressa, Prosper, RateSetter, Sindeo, smava, SocietyOne, Sofi, Tala, Umati Capital, Upstart, Wonga |
| Payment | Aspiration, Azimo, BitPesa, bKash, Bloom, Doxo, Dwolla, Even Financial, ftcash, Humaniq, Jimu, Juba Express, M-Pesa, MODE, Modest Needs, Money Forward, monyq, N26, Paganza, PaySe, Pennies, PesaPal, Perfios, Prism, Remitly, Simpl, Simple, Slicepay, TransferWise, WorldRemit, Xoom |
| Wealth Management | Betterment, digit, DriveWealth, eToro, Hedgeable, Koho, Levanto Financial, Motif, Nest Wealth, Robinhood, SigFig, Stash, Stockpile, Tink, Wealthfront, Wealthsimple, WiseBanyan |
| Other | Amply, DueDil, Onfido, Trulioo |

Source: Author's own construction using data collected from public sources

Hundred selected fintechs were analyzed with the goal to identify fintechs whose business models could either directly or indirectly be associated with TBL principles in some aspects of their operations. In general, companies who targeted the under-or unbanked or the BoP segment used a strategy of promoting strong visual images with rural African or Indian populations. In some cases, the websites clearly stated the companies' missions. The mission of Kreditech, a credit-scoring fintech, is "Banking the Underbanked." In other cases, the targeted user group or the primary location of the service were used as an impact factor. Fintechs which appeared to be aiming to improve the financial inclusion of African, Indian, or other countries – or underbanked populations were selected. Some fintech companies provided services globally, although their minimum investment was specified as being thousands of dollars. These companies were excluded – although technically they may also provide services to rural areas, the cost of the service and the entry threshold is generally too high for people living at the BoP. Wealth management services were thus also excluded, as according to the information on their websites their primary tar-

get customers are members of the wealthier population with sound financial literacy and some savings. In cases when product or services were described as being easy to access with a low barrier to entry, the goal of financial inclusion was most apparent. Services that linked Western lenders to BoP borrowers were also categorized as companies with TBL impact, as these services further improve the credit available to microfinance local businesses. As a caveat to the selection process of fintech from a TBL perspective, the following facts should be noted: First, company websites were not always organized along clear lines so as to allow identification of whether they have a direct or non-direct TBL impact, thus it is possible that some companies were excluded from the sample – and that companies with a questionable impact were included. Second, it was found to hard any references or feedback from users who actually use the related services, thus it was difficult to identify whether the service is actually accomplishing its goals. An overview of the companies which were categorized as having TBL impact is included in *Table 3*, with a short description of each:

Table 3.

Fintechs with TBL value-creation elements

| Name | Category | Description |
|-------------|------------------|--|
| Abacus | Capital markets | A web and mobile software that helps investors across the globe access African financial markets. |
| Lelapa Fund | Capital markets | An investment platform that connects global investors with African growth ventures. |
| GoFundMe | Capital markets | The world's largest social fundraising platform, having raised over \$5 billion USD. A community of more than 50 million donors. |
| Amplify | Other | Digital identity service. Received seed investment from UNICEF's new innovation fund. The service strives to revolutionize early childhood development in Africa. Combines mobile and blockchain technology. |
| Taqaanu | Digital Identity | Digital identity solution, using blockchain technology. |
| Trulioo | Other | Digital identity service. It has developed a global ID verification solution to help verify 4.5 billion people and 250 million companies in over 100 countries. |
| Aire.io | Lending | Credit risk profiling for the BoP. |
| Branch | Lending | Lending services in San Francisco, Nairobi, Lagos and Mumbai. Lending is based on data collected (with permission) from mobile phones, GPS data, call logs, social network data, contact lists. |
| GuiaBolso | Lending | Low-rate lending. Available only in Brazil. |
| Kiva | Lending | An international nonprofit, founded in 2005. The mission is to connect people through lending to alleviate poverty. Microlending starts from 25 dollars, with 2.8 million borrowers in 86 countries. |
| Kreditech | Lending | The mission is to provide banking to the underbanked. Targets two billion adults worldwide who are underbanked. Three hundred employees from 40 nations at seven office locations. |
| Lenddo | Lending | Creating credit scores to improve the lives of the emerging middle class in developing countries by providing micro loans for specific purposes. |

| | | |
|---------------|---------|---|
| Lend-withcare | Lending | Lending platform which lends a minimum of 15 pounds to fund a small business and support poor entrepreneurs. |
| MaTontine | Lending | Lending services for the financially excluded earning less than \$5/day. |
| Tala | Lending | Credit scoring and lending with a new credit scoring model based on thousands of mobile data points, including network diversity, social connectedness, geographic patterns, and financial transactions. |
| Umati Capital | Lending | Offers a variety of credit products. |
| Wonga | Lending | Short-term cash flow management service in South Africa, Poland and Spain. |
| Aspiration | Payment | Payment solution with built-in donations for charitable causes. |
| Azimo | Payment | Money transfer company whose goal is to make sending funds simpler and more cost effective. |
| BitPesa | Payment | Payment startup. Present in 85 countries, with 6,000 users. |
| bKash | Payment | bKash is a payment service owned by BRAC Bank. Available only in Bangladesh. |
| ftcash | Payment | ftcash is a financial services company which started operating in 2015, and is headquartered in Mumbai, India. The goal of ftcash is to empower micro-merchants through digital payments and loans. |
| Humaniq | Payment | Humaniq is a services platform with its own cryptocurrency. Its goal is to power the unbanked. The service already has 129,000 members. |
| M-Pesa | Payment | Payment services provider in Kenya. M-Pesa is fully regulated. |
| MODE | Payment | MODE operates in 31 countries with a customer base of over 250 million. Loans and remittance transfers are the key focus: Countries include: Kenya, India, Nigeria, Mauritius, UAE, Uganda, South Africa, Cameroon. |
| Modest Needs | Payment | Modest Needs makes small, emergency grants to low-income workers who are at risk of slipping into poverty. |
| PaySe | Payment | Winner of payment system innovation India. Blockchain solution. |
| Pennies | Payment | Pennies is the digital upgrade of the traditional charity box. It helps with donating a few pence to charity when paying by bank card. |
| PesaPal | Payment | An African fintech which helps to make and accepts individual and business-related payments in Africa. |
| SlicePAY | Payment | A digital payment platform with a mission of simplifying payments for the young. Available in India only. |

Source: Author's construction based on information publicly available on company websites

Sustainable banking frameworks

Sustainable banking frameworks and organizations that are working to provide guidelines for sustainable banking do exist. Some of the most important ones include the Alliance for Financial Inclusion, the Equator Principles, the Global Impact Investing Network's Impact Reporting and Investment Standards, The London Principles of Sustainable Finance, the SIGMA Guiding Principles, the UNEP's FI Statement by Financial Institutions, and the US's Social Investment Forum. The different frameworks,

guidelines, and indicators have different merits, and a short summary of each of them is provided in *Table 4*. Current frameworks were designed with large FIs in mind with a focus on traditional bricks-and-mortar banking and project financing of millions of dollars. The limitations of these frameworks are apparent: they create extra planning, reporting and execution overheads for companies, thus only large FIs can use them. Their use in fintechs is restricted due to their size, available resources and organizational maturity. However, while the frameworks include elements about both the direct and indirect factors that affect the TBL of financial institutions to varying degrees, these are mostly related to tangible internal and external impacts and exclude factors such as social scaling and financial inclusion. The inclusion of indirect factors such as dynamic capabilities, innovation, knowledge, human resources, intellectual capital, and information technology, among others, are often missing from the guidelines (Tsai – Tsai – Chang, 2013).

Table 4.
Sustainable banking frameworks and organizations

| Organization / Principles | Description |
|--|---|
| Alliance for Financial Inclusion (AFI) | A global knowledge exchange platform for improving financial inclusion policy, and helping policymakers to increase access to quality financial services for the poorest populations. |
| Equator Principles (EPs) | EPs apply to Project Finance Advisory Services when total project capital costs are US\$10 million or more; Project Finance with total project capital costs of US\$10 million or more; Project-Related Corporate Loans in an aggregate amount of at least 100 million USD. Ninety-two financial institutions (EPFIs) have adopted the EPs in 37 countries. |
| Global Alliance for Banking on Values (GABV) | A network of banking leaders from around the world committed to advancing positive change in the banking sector, in which the TBL approach sits at the heart of the business model of the bank. |
| Global Impact Investing Network (GIIN) | Network for impact investing powered by investors who are determined to generate social and environmental impact as well as financial returns. Five key values of GIIN are: Responsible Leadership, Intellectual Rigor & Curiosity & Excellence, Learning & Adaptation, Diversity of Perspectives, Team Spirit. |
| GRI Sustainability Reporting Standards | The most widely adopted global standards for sustainability reporting. Ninety-three per cent of the world's largest 250 corporations report on their sustainability performance based on GRI. |
| Social Return on Investment (SROI) | SROI was developed by the Roberts Enterprise Development Fund (REDF) in the United States in the mid-1990s. It has a focus on expressing social benefits in monetary terms by using contingent valuation methods, such as willingness to pay and willingness to accept. |

| | |
|---|---|
| The London Principles of Sustainable Finance | The London Principles were launched by Tony Blair at the Johannesburg summit in 2002. The goal of the London Principles is to demonstrate good practice through case studies of a number of UK-based financial institutions through a voluntary code and set of seven principles for financial institutions. |
| The SIGMA Guiding Principles | The SIGMA Project was launched in 1999 by the British Standards Institute, Forum for the Future, and AccountAbility with the goal of preserving the five capitals: Natural capital, Social capital, Human capital, Manufactured capital, Financial capital. |
| UNEP FI Statement by Financial Institutions | Members include 200 financial institutions, including banks, insurers, and investors, working with UN Environment to understand today's environmental, social and governance challenges. |
| US Social Investment Forum (US SIF) | The goal of US SIF is to advance sustainable, responsible and impact investing across all asset classes in the US, focusing on long-term investment and the generation of positive social and environmental impacts. Members include investment management and advisory firms, mutual fund companies, asset owners, research firms, financial planners and advisors, broker-dealers, community investing organizations and nonprofit organizations. |
| World Bank Environmental and Social Framework | Defines the World Bank's criteria for assessing projects with the aim of ending extreme poverty and increasing shared prosperity. It requires borrowers to report on: assessment and management of environmental and social risks and impacts, labor and working conditions, resource efficiency and pollution prevention, community health and safety, land acquisition, biodiversity conservation, and several other factors. |

Source: Author's construction, based on publicly available information found on organizations' official websites

Current frameworks were designed to ensure that the reporting of large FIs is standardized based on criteria such as their internal operation and direct environmental impact, and through their products or services such as project financing. Such overly descriptive frameworks are not useful for assessing the impact of companies which often provide loans to the value of 25 dollars towards projects with an overall project value of a few thousand dollars. With such projects, factors such as environmental impact analysis, land acquisition, or biodiversity conservation must be assessed in a different manner. On the other hand, it is necessary to have a smaller scale, yet effective framework for fintechs as well, as these companies are often the first entry point for the involvement of the previously non- or underbanked in financial services and thus have a great impact on how these populations are educated about project criteria, or the use of finance. A framework is also useful if it is only voluntary, as it helps to guide new service or product development and gives companies the opportunity to make a statement by starting to report according to the criteria laid out in the framework.

TBL Impact Analysis Framework of Fintech

The creation of a lightweight TBL Impact Analysis Framework for Fintechs has three benefits: First, operating ventures can assess their current way of doing business and can make an educated decision about whether they need to improve in some areas. Second, companies which are just in the process of defining their mission, strategy and business models can find support for integrating TBL perspectives into their core operations. Third, such a framework can be used as a guide to foster systemic innovation within the financial sector: it may help companies to create structured, voluntary reporting which can be used to develop future policies and considerations for investors that help them with investing decisions (such as which fintechs should they be investing in). As fintech are faster at prototyping new solutions than traditional banks, the impact of their TBL services can be a good indicator of the feasibility of large-scale adoption by traditional universal banks. Another fallacy of presently available frameworks is that they are not adopted to how small technology companies are modifying their business operations and developing services. Agile development, lean product and service development, business models, scaling through IT, and the use of design thinking techniques such as co-creation are the key value drivers behind their operations (Varga, 2017).

The TBL Impact Analysis Framework for Fintechs was created with the following principles in mind. It should be: 1) Easy to understand: TBL perspectives are clearly organized according to the three major categories, economic, social, and environmental value creation; 2) Gradually adoptable: to promote uptake of the framework it contains sets of areas in which companies can voluntarily improve their TBL impact. There is no need to adopt or to excel in all areas from the beginning; a company needs to continually assess and measure its progress against its goals and make improvements based on its findings. There is no universal business model or company structure that fits all – each company should design a strategy that fits its purposes best. On the other hand, there must be a scale for adoption to encourage further steps and development, therefore the framework offers three levels of depth: from Level 1 to 3. Another principle is: 3) Focus on holistic, controllable factors: current sustainability banking frameworks often focus on factors that are either taken out of context or not viewed holistically. The strategic elements which are under the control of the company must come first when improving the TBL impact of a company, as these factors will inherently change all related factors and procedures as well. Such an approach enables companies to integrate TBL principles into the core of their operations rather than view them as a reporting metric and a line on a spreadsheet. Core operations, value drivers and resources and capabilities should be aligned to deliver long-term sustainable benefits. TBL then becomes an integrated way of doing things: the reason “why” and explanation “how” a company behaves in their daily activities.

The goal of the proposed framework is to increase discussion and provide a starting point for fintech in their TBL journey. Based on their experiences and feedback, the framework can be adapted and modified as customers and fintechs companies discover areas for improvement. The value-creation items in the framework are based on current IT development and lean product development principles that have been adopted by fintechs and startup companies, and the literature on business modeling, open innovation and TBL that has already been described. The categorization of Level 1 to Level 3 is based on the author’s perception of organizational development and will be adjusted to the specific company strategy. The frameworks are intended to offer a guideline, but not a prescriptive set of “must-haves,” as each company must define its own optimum business case based on its company vision and mission. (Table 5)

Table 5.

**TBL Impact Analysis Framework
of Fintech Companies**

| Value creation | Level 1 | Level 2 | Level 3 |
|-------------------------------|--|---|---|
| Economic values | | | |
| Business model | Some of the building blocks but not the value proposition contains TBL elements. | TBL perspectives are included in the business model, and also affect the value proposition. | The value proposition of the company is centered around TBL value creation. |
| Mission | TBL is not or non-visibly an integrated part of the company’s mission. | TBL is a clearly articulated element in the company’s mission. | TBL value creation is the core mission of the company. |
| Organizational model | The company is non-transparent (publicly) about its operating principles. | Company shares internal guidelines and approaches with public; employees are key assets. | Company is experimenting with new organizational models, such as holacracy. |
| Product / Service Development | TBL perspectives are not integrated into the design of the product / service. | The company articulates how TBL is included in the design of the product / service. | The company continuously monitors, audits and adapts its products / services to improve TBL impact. |
| Profit distribution | The company is focused on maximizing ROI with minimum social effort. | Some profit is distributed towards social and environmental goals. | Large part of the profit is distributed towards social and environmental goals. |
| Reporting | No reporting about TBL perspectives. | Voluntary reporting without external audit. | External auditor is involved in reporting. |
| Scaling | Product / service is hard to adopt in different markets as it requires advanced / or expensive technology. | Product / service is designed to scale up rapidly due to conscious use of hardware or network requirements. | The company actively analyses and overcomes restrictions on product scaling: e.g. provides education. |

| | | | |
|-------------------------------|--|--|--|
| Service Fee | Flat service fee, with no differential factors built-in, such as good credit history or purpose. | Service fee includes differential pricing with advanced, tailor-made and personalized pricing. | Service fee includes personalized pricing, and social / environmental impact calculation. |
| Social values | | | |
| Access to service | Limited to certain groups due to higher cost, advanced technology, language selection. | The service aims to increase ease of access to different social and demographic groups. | The service was designed so even BoP and under-privileged social groups can access it easily. |
| Cultural fit | Service was created without consulting end users. | The service is based on initial field studies, and research with end-users. | The service is continuously assessed and adapted to improve cultural fit. |
| Literacy needs | Complex product/service with high literacy needs. | Clear and understandable service features, but still complex user interface. | Simplified, easy to use user interface, even for non-schooled groups. |
| Partnerships | No or very little number of partnerships in the area of sustainability. | Some partnerships in the area of sustainability and local groups. | Company is actively pursuing and has established active local and global partnerships. |
| Stakeholder management | No or little active discussion with stakeholders, lack of clear stakeholder management plan. | Company has a stakeholder management map and pursues non-frequent dialogue with its stakeholders. | Company is actively engaging with its stakeholders, building common development road-maps together. |
| Environmental values | | | |
| Direct Environmental Impact | No internal or external carbon footprint assessment within the company. | Some measures, including waste management and decreasing paper use in its internal and external processes. | Holistic approach to minimizing environmental impact throughout the supply chain. |
| Indirect Environmental Impact | The company does not measure the indirect environmental impact of its services. | The company requires some information about the environmental impact created by its services. | Company provides services only to those who meet its explicit expectations regarding the environmental impact created by its services. |
| Environmental Policy | No environmental policy exists within the company. | There is a guideline, but no mandatory policy within the company. | There is a mandatory environmental policy within the company. |

Conclusion

During the research, four important findings were identified with regard to current sustainable baking frameworks and the role of fintech in TBL value creation: First, current

sustainable banking frameworks are not unified, and are maintained by different organizations with no evidence of structured alignment between the different initiatives. The current frameworks in most cases lack the inclusion of small, innovative ventures, and only include universal banks and well-funded institutions. Maintaining too many different standards may have a counterproductive effect as it can cause confusion in the sector and make room for many alternative interpretations.

Second, traditional banks have failed to financially include some segregated groups, such as members of the BoP. Fintechs may be able to improve the current status quo and improve social and environmental value creation by using ICT and new business models. However, there is no currently available framework for assessing and promoting the TBL impact of fintechs. The creation of such a framework is an important goal, as fintechs can prove the viability of new business models, opening up opportunities for more risk-averse banks to invest into new areas of product development.

Third, during the analysis of more than hundred operating fintechs it became apparent that the public information provided by fintechs is often overly narrow or secretive. Their websites and other communication channels are not effective at conveying the TBL impact of their services. There are two possible explanations for this: Even those companies that provide services to the BoP or have a TBL impact are primarily interested in revenue creation, and the social and environmental impacts of their services are only an indirect effect of their primary activities. Second, fintech companies have not yet recognized the importance of clearly communicating the sustainability impact of their services. The communication of the companies under analysis is mostly focused on strong visual images, but TBL value creation is demonstrated only in a few cases in the company missions or other descriptive elements.

Fourth, to be effective a TBL Impact Analysis Framework for Fintechs needs to be tested and further researched based on empirical data and in cooperation with fintech companies. To gain the largest benefits the proposed framework needs to be taken out to the real world, where it is continuously measured and adjusted based on feedback from market participants.

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PATTERNS OF OPTIMISM AND EMPLOYEE WELL-BEING

A PERSON-ORIENTED APPROACH TO EXPLANATORY STYLE IN HUNGARIAN EMPLOYEES

Employee well-being is increasingly recognized as a key aspect of individual and organizational performance. Optimistic mindset – conceptualized as explanatory style of interpretation of positive and negative events – is an important aspect of employee well-being. The present study aims to explore different types of explanatory styles in Hungarian employees in relation to their well-being and relies on a recently developed situational judgment test of the optimistic mindset, the MQ Test (Kovács – Martos, 2017) measuring optimism as a reaction to positive and negative situations. In the present study, cross-sectional data of 992 Hungarian employees were analyzed using a person-oriented approach (Bergman – Lundh, 2015). Cluster analysis revealed five patterns of explanations for positive and negative events that were tentatively labeled as ‘Winner’, ‘Fighter’, ‘Lucky’, ‘Survivor’ and ‘Wonder seeker’ clusters. Associations of the clusters with well-being indices (self-efficacy, self-esteem and life satisfaction) indicated that there are significant differences between the cluster members. Results are interpreted with regard to the potential resources and weaknesses of the five strategies in organizational functioning as well as to the possibility of using explanatory style development in job related trainings.

Keywords: employee well-being, explanatory style, person-oriented research, cluster analysis, Hungarian employees

Employee well-being is increasingly recognized as a key aspect of individual and organizational performance (c.f., Bakker – Demerouti, 2018; Boxall – Guthrie – Paauwe, 2016; De Neve – Diener – Tay – Xuereb, 2013; Nielsen – Nielsen – Ogbonnaya – Käsälä – Saari – Isaksson, 2017). Well-being becomes a more and more important factor of high performing companies. It is evident that negative feelings and stress destroys not only the quality of employees’ private life but influences the level of several key performance indicators as well, like employee turnover rate, sick leaves, sales results and others. Moreover, the notion of ethical leadership also contains reference to aspects of well-being (Guest, 2017) stressing the responsibility of the leadership toward monitoring and improving positive functioning in the employees (Inceoglu – Thomas – Chu – Plans – Gerbasi, 2018). Therefore, recent research focused on several important aspects of employee well-being, including its temporal stability (Mäkikangas – Kinnunen – Feldt – Schaufeli, 2016) and content (Mäkikangas – Kinnunen – Feldt, 2004). employee well-being and performance were connected to individual characteristics like self-efficacy, hope and, most notably, optimism, both theoretically and empirically (Bakker – Sanz-Vergel, 2013; Luthans – Youssef, 2004; Nielsen – Nielsen – Ogbonnaya – Käsälä – Saari – Isaksson, 2017). For our approach, optimism is of primary importance, therefore, we focus on this concept below.

Optimism and explanatory style

Optimism, that is, a positive attitude toward future events and the self itself, is among the core concepts of positive psychology (Peterson – Steen, 2009). Compared to other approaches where optimism is regarded as a stable individual characteristic (c.f. Carver – Scheier – Segerstrom, 2010), the theory of learned optimism (Seligman, 1991)

conceptualizes optimism/pessimism rather as a cognitive process. In this approach, an optimistic stance toward the future connected to a personal explanatory style (frequently named also attributional style) of life events. Explanatory style is a person’s relatively stable mindset with which he/she explains the causes of positive and negative events and situations. According to the theory, explanations may involve three interrelated aspects of the assumed causes in our explanation. First, Stability (S) of the causes refers to the time frame, that is, the actual cause may be stable vs. unstable in time. Second, Globality (G) captures whether the individual sees the actual event as the result of general, decontextualized or distal agents that have an effect on other events as well vs. specific, situation bound or proximal agents that affect only the specific event itself. Third, Internality (I) refers to the assumed role of the individual himself; internal causality attributions place the agency inside the person herself while external causality attributions put the causes of the event into external agents.

This way, an optimistic mindset can be characterized with the interaction of the above described three dimensions of the explanations (S, G and I), as well as the nature of the situation (negative vs. positive). For the explanation of negative situations an individual with optimistic explanatory style tends to use external causes along with seeing the situation as particular and temporarily sporadic (e.g., it was caused by somebody else, and it occurred just here and now). On the other hand, in case of positive events an optimistic explanatory style would involve internal causality, along with a generalized and temporarily extended view of the situation (it was me, and it can happen elsewhere and other times as well). Both patterns of optimism were found to be positively related to better mental health, higher self-esteem, lower depression and lower risk of post-traumatic stress disorder (Peterson – Seligman, 1984;

Peterson – Steen, 2009). Moreover, optimistic explanations are associated with better skills in identifying one's own emotional experiences (Gohm – Clore, 2002). Those respondents who were able to better perceive, interpret and express their emotional experiences also made more optimistic (stable, global and internal) attributions for good events as measured by the Attributional Style Questionnaire.

Explanatory style in work context

Explanatory styles have been studied with regard to the workplace experiences as well. It was shown that burnout in one's work may be predicted by pessimistic attributional style, along with dysfunctional attitudes and ruminative thinking style (Bianchi – Schonfeld, 2016). In line with this association, different facets of optimistic explanatory style were found to contribute to effectiveness and effort in the work experiences of Indian IT professionals (Fernandes – Sunkarapalli – Nandinee – Pallavi, 2016). In their overview Rana and Chadha (2017) argue that it is possible to learn a more optimistic explanatory style and higher optimism. It is connected not only to higher personal well-being but also to better performance in the workplace (c.f., Guest, 2017). Specific work related measures of explanatory styles (e.g., Proudfoot – Corr – Guest – Gray, 2001) provided evidence that optimistic explanations relate positively to higher work motivation, learned resourcefulness as well as to lower psychological strain and intention to quit.

Researchers also investigated the relevance of the explanatory style in business successes. For example, self-leadership was proposed as an umbrella concept representing an individual level characteristic of the employee or entrepreneur: self-leadership may channel several motivational and psychological constructs, among them also optimism and explanatory style as well, and may contribute to improved personal functioning and business performance (D'Intino – Goldsby – Houghton – Neck, 2007). Previous conceptualizations suggested that an optimistic explanatory style could be a key factor in the development of professional self-efficacy (Kasouf – Morrish – Miles, 2015). Moreover, when investigating team performance it was found that more successful teams were more optimistic in their explanatory style as well (Carron – Shapcott – Martin, 2014) especially in internality and globality.

A situational judgment test approach to optimism: the MQ Test

Recently, Kovács and Martos (2017) reviewed several approaches toward measuring explanatory styles and concluded that most measures apply a series of abstract evaluations for the stability, globality and internality aspects of the events. They argued, however, that a situational judgment test (SJT; Motowidlo – Dunnette – Carter, 1990) approach may be a viable alternative for assessing ecologically valid reactions to real life situations and they considered an SJT based approach to measure explanatory style

of the individuals. In the last decades personnel psychology and assessment often capitalized the unique features of an SJT approach (c.f., Campion – Ployhart – MacKenzie, 2014). Instead of measuring general self-knowledge or attitudes, SJTs target at the procedural knowledge of the individual in real life situations, i.e. the “how” of his/her reactions, responses and attitudes. To reach this end, situational judgment tests present descriptions or pictorial depictions of relevant situations for the measurement and ask respondents to make choices among the provided realistic responses (Weekley – Ployhart, 2006). Research showed that scores obtained by a SJT assessment procedure were valid predictors for long term success and performance (Lievens – Sackett, 2012).

This approach was applied to the measurement of optimism and the development process resulted in a new SJT based measure of the explanatory styles, the MQ Test. Kovács and Martos (2017) documented adequate psychometric characteristics and validity of the measure. Their results showed that an optimistic explanatory mindset – as measured by SMQ Test dimensions – comprises an integral part of the person's self-system and represents an important way of social-cognitive information processing (cf., Mischel – Shoda, 1995). At the same time, their results indicate that an optimistic explanatory style may have consequences also for the subjective experience of the individual. For example, a more optimistic mindset in negative situations may strengthen the personal capacity for resilience and thus may contribute to the appreciation of positive aspects of one's life, that is, hope, self-efficacy and self-esteem.

The MQ Test as a measure of optimistic mindset has a series of distinctive features that make it unique among the explanatory style questionnaires. First, it refers to both personal life and work life situations in a balanced quantity. Second, its measurement approach follows the SJT approach by offering real life thinking patterns as responses instead of abstract evaluative categories as in many of the above reviewed explanatory style questionnaires. Finally, the development of the MQ Test aimed at fitting well in the Hungarian and in a broader sense European culture as well, both through the depicted situations and the provided reaction alternatives.

The person-oriented approach

While scientific research on well-being and more specifically on explanatory styles has been long dominated by variable-oriented approaches (e.g., analyses based on means or covariations), the so called person-oriented approach is gradually gains significance in psychological investigations. Both approaches have different theoretical assumptions and methodological solutions (Bergman – Lundh, 2015). Variable-oriented approaches treat separate individual characteristics and the variables that represent them as units of the questioning and look for generalizable associations between them. Person-oriented approaches are based on a holistic view of the person and emphasize that personal characteristics interact with each

other as parts of a complex integrated system (Bergman – Lundh, 2015; Bergman – Magnusson – El-Khoury, 2003). Therefore, on the methodological side, studies use pattern identification methods, mostly cluster analysis and structural equation modeling based techniques like latent class analysis and latent profile analysis (Bergman et al., 2003; Laursen – Hoff, 2006).

Person oriented approach is increasingly used in work context and in studies of employees' well-being as well (see a recent Special Issue on the topic in *Organizational Psychology*, e.g., Morin – Bujacz – Gagné, 2018). Mäkikangas and Kinnunen (2016) reviewed job burnout literature and identified several studies that used a person-oriented approach. They concluded that a person-oriented approach was more sensitive to the heterogeneity of the burnout experiences and might better detect atypical burnout types and trajectories. For example, (Leiter – Maslach, 2016) identified five patterns of burnout dimensions that may be meaningfully placed on a burnout-engagement continuum. In a three wave assessment Kinnunen and colleagues (Kinnunen – Feldt – Sianoja – de Bloom – Korpela – Geurts, 2017) identified several time patterns of work-related rumination processes and found that these time patterns predicted different well-being outcomes in work. In another line of research based on self-determination theory (SDT, Ryan – Deci, 2000) work motivations were analyzed in a person-oriented manner (e.g., Gillet, Fouquereau – Vallerand – Abraham – Colombat, 2017; Graves – Cullen – Lester – Ruderman – Gentry, 2015; Howard – Gagné – Morin – Van den Broeck, 2016). Different profiles of external, introjected, integrated and intrinsic self-regulation strategies in work revealed that several different types of work motivation existed and that these types of motivation could not be reduced to a simple one dimensional extrinsic-intrinsic continuum (Friederichs – Bolman – Oenema – Lechner, 2015; Moran – Diefendorff – Kim – Liu, 2012). In sum, person-oriented approach may reveal meaningful patterns of emotional experiences, cognitions and motivated actions. However, after a careful literature search we may conclude that this kind of approach has not been applied yet to explanatory styles.

The present study

The aim of the present study is to provide the first person-oriented analysis of explanatory styles based on the MQ Test (Kovács – Martos, 2017). In their validation study, Kovács and Martos (2017) found that MQ Test results are best interpreted as two interrelated but distinct factors (i.e., explanations for positive and negative events). Moreover, they found a predominance of the MQ-N dimension in the associations with constructs of well-being, that is, the use of optimistic handling of negative situations may be a more stable source of positive experience and well-being. Therefore, we will use these dimensions for the subsequent analysis. This approach is in line with the great part of the psychometric research

on explanatory style questionnaires (e.g., Ashforth – Fugate, 2006; Liu – Bates, 2014; Proudfoot, et al., 2001; Smith – Caputi – Crittenden, 2013) indicating that the personal explanatory style may be somewhat different for positive and negative situations. By identification of explanatory style patterns in a sample of Hungarian employees this research may also provide valuable insight for organizations, HR practitioners and leadership decisions on workforce development. For example, MQ Test based explanatory style types may give a powerful tool to develop employees' resilience in a personally tailored way.

Our approach is exploratory in nature, that is, we don't want to set hypotheses regarding the number and characteristics of types of explanatory dimensions. Moreover, we intend to examine the resulting types in terms of their association with other well-being indices (satisfaction with life, self-esteem, self-efficacy) and sociodemographic characteristics.

Method

Samples and procedure

Sample 1, community assessment

In an online survey we collected data using snowball methodology and online advertisement for reaching the potential participants. The survey was provided in Hungarian and all participants were of Hungarian nationality. Eligibility for participation was predefined as having a full time equivalent job and being older than 18 years (adults). Subjects participated voluntarily and anonymously and got no payment for the participation. Respondents who did not meet the inclusion criteria (typically students) were omitted from the analysis. In sum, 459 Hungarian employees participated in the study, 139 male and 319 female (30.3 %, mean age 45.4±15.4 years and 69.5 %, mean age 44.3±12.0 years, respectively, with 1 case, 0.2 %, missing). Most of the sample graduated from higher education (N = 329, 71.7 %), 26 respondents (5.7 %) completed primary school and 103 respondents had a high school degree (22.4 %, 1 case, 0.2 %, missing). Approximately half of the sample (N = 230, 50.2 %) was employed as operative employees, while 217 respondents (47.2 %) worked as a manager, among them 92 in low-level management, 92 in mid-level management and 33 in top management positions. 12 respondents (2.6 %) did not give a position.

Sample 2, corporation assessments

Sample 2 consisted of a cumulative dataset of employees of Hungarian companies that used the MQ Test for human resource development through the assessment center of Profil Training Ltd. from 2009 to 2016. In sum, 543 data from employees were included into the database. Due to data handling policy of the assessment, only gender information was available for the cases. There were 140 male (25,8%) and 265 (48,8%) female respondents in this sample, with 138 cases (25,4%) with missing data on gender.

Measures

MQ Test

The 36 item version of the MQ Test was used (Kovács – Martos, 2017). Each of the 36 items depicts everyday situations (both from the private and work life domains) and provides two different options as potential immediate reactions to the depicted situation. Respondents are asked to imagine the situations and indicate on a 10 point scale which answer they would endorsed more likely if they were in the actual situation. Every provided pair of reactions implicitly captures one aspect of the explanatory styles, i.e., they are worded to imply explanations for either stability, globality or internality of the causes. Item scoring is based on an a priori classification of the reactions, always assigning 1 to the least optimistic and 10 to the most optimistic reaction (for a more detailed description see Kovács – Martos, 2017). During the assessment there was no hint for scoring of the items. We used the standard response format as depicted in *Figure 1*. From the individual responses we computed summed scale scores for positive (MQ-P) and negative situations (MQ-N) separately and also computed the total MQ score as a sum of MQ-P and MQ-N scores. The psychometric properties of the MQ scales were satisfactory (see *Table 2*).

Figure 1.

Sample item and response format

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| You receive a new assignment that you really enjoy. | | | | | | | | | |
| I enjoy it because I'm really good at this! | | | | | I enjoy it because this is an interesting task. | | | | |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Note: In this case, agreement with the left extreme scores 10 and the right extreme scores 1. All other options score between 1 and 10 according to the actual response

Self-efficacy Scale (SES).

The ten item Self-efficacy Scale (SES; Schwarzer – Jerusalem, 1995; Kopp – Schwarzer – Jerusalem, 1995) aims to measure the generalized beliefs on personal efficacy of the individuals. Statements were evaluated on a seven point Likert-type scale (1 = Not at all true, 7 = Exactly true). Internal consistency of the measure was good (alpha = 0.885; sample item is “It is easy for me to stick to my aims and accomplish my goals.”).

Satisfaction with Life Scale (SWLS)

The five items Satisfaction with Life Scale (SWLS; Diener – Emmons – Larsen – Griffin, 1985; Martos – Sallay – Désfalvi – Szabó – Ittész, 2014) is scale for assessing the cognitive component of subjective well-being, i.e., satisfaction with life. Items are scored on a 7 point Likert-type scale (1 = strongly disagree, 7 = strongly agree). Internal consistency of the measure was good (alpha = 0.882 ; sample item is “I am satisfied with my life.”).

Rosenberg Self-esteem Scale (RSES)

The ten item Rosenberg Self-esteem Scale (RSES Rosenberg, 1965, Sallay – Martos – Földvári – Szabó – Ittész, 2014) is a widely applied measure for assessing general self-esteem of the respondents. The Likert-type response format ranged from 1 (strongly disagree) to 7 (strongly agree) in our study. Internal consistency of the measure was excellent (alpha = 0.905; a sample item is “I take a positive attitude toward myself”).

Results

Overview of the analytic process

After initial data screening and identification of basic psychometric properties of the scales (see *Table 1*. for an overview) first we checked the sample for potential outlier cases. Second, using MQ-P and MQ-N subscales of the MQ scale we run cluster analysis using the pattern recognition module of the ROPstat software (Vargha, 2016). In an iterative process we identified the most appropriate number of clusters (c.f., Takács – Makrai – Vargha, 2015; Vargha – Bergman – Takács, 2016). Cluster membership was then compared to other indices of psychological functioning like self-efficacy, satisfaction with life and self-esteem. To better understand the meaning of the different clusters we also run a case study analysis on the interview transcripts of a selected subsample.

Preliminary analyses

Table 1.

Descriptive statistics, psychometric properties and bivariate correlations for the variables

| | Scale | Alpha | m | SD | Pearson correlation coefficients | | | | |
|---|-------|-------|--------|-------|----------------------------------|-------|-------|-------|-------|
| | | | | | 1 | 2 | 3 | 4 | 5 |
| 1 | MQ-P | 0,720 | 115,06 | 22,88 | | | | | |
| 2 | MQ-N | 0,653 | 113,79 | 18,74 | 0,378 | | | | |
| 3 | MQ | 0,770 | 228,84 | 34,62 | 0,865 | 0,791 | | | |
| 4 | SES | 0,885 | 5,39 | 0,94 | 0,416 | 0,467 | 0,549 | | |
| 5 | SWLS | 0,882 | 4,60 | 1,41 | 0,305 | 0,266 | 0,359 | 0,369 | |
| 6 | RSES | 0,905 | 5,51 | 1,15 | 0,388 | 0,412 | 0,499 | 0,577 | 0,561 |

Notes:

N = 994 for MQ variables and 451 for SES, SWLS and RSES
 MQ-P = positive situations, MQ-N = negative situations; MQ = Total MQ score, SES = Self-Efficacy Scale, SWLS = Satisfaction with Life Scale, RSES = Rosenberg Self-esteem Scale
 For all correlation coefficients p < 0.001

First we run descriptive statistics and bivariate correlations for the main variables (*Table 1*). All cases were complete in regard to the target variables MQ-P and MQ-N. There were 451 complete cases where psychosocial well-being variables were computable. For all scales, including MQ-P and MQ-N, we estimated alpha coefficients as indices of internal consistency. Alpha coefficients were acceptable in magnitude for the MQ Test subscales ranging from 0,653 (MQ-N) to 0,720 (MQ-P) and good for well-being measures ranging from 0,882 (SWLS) to 0,905 (RSES). Inspection of bivariate correlations revealed that association between

MQ-P and MQ-N was of only medium effect size ($r = 0,378$, $p < 0,001$) indicating that while there is a certain correspondence between these two aspects of explanations they cannot be reduced to each other by no means. This relative independence showed also that the variables are appropriate for entering into a cluster analysis.

Moreover, it is well known that outliers can severely bias the results of cluster analysis (e.g., Milligan – Hirtle, 2003). Therefore, to identify potential outlier cases with regard to the variables in the cluster analysis, that is, MQ-P and MQ-N, we run residue analysis with a threshold of 0,7 (c.f. Bergman, et al., 2003, p. 109-110.; Vargha – Bergman – Takács, 2016). According to this analysis no case was found as an outlier therefore we retained the whole sample.

Cluster analysis of the MQ Test scales

As a next step we conducted hierarchical cluster analysis and compared 3 to 10 cluster solutions with regard to their adequacy. Hierarchical cluster analysis was run on standardized variables via Ward method with squared Euclidean distances which maximizes the difference between the groups and minimizes it between the clusters. Following the procedure described by Vargha and colleagues (Vargha – Torma – Bergman, 2015), in the first run we retained 3 to 10 clusters for further investigation. For each of the actual cluster solutions we investigated the most important adequacy measures (explained variance, Point-biserial correlation, Silhouette coefficient, average cluster homogeneity; see Vargha et al., 2016). Results are presented in Table 2. Number of clusters for the final solution was based on inspection of the adequacy measures as well as preliminary interpretation of the different cluster solutions. We retained the five cluster solution for further analysis because we found that this solution maximize the somewhat competing aspects of interpretability, goodness of fit and explanatory power. When we compare the adequacy measures (see Table

2) we can conclude that $N = 5$ seems to be an appropriate solution in several ways. EESS = 71,18%, which is satisfactorily high while the next solution adds proportionally less to this value than the previous solutions. Point-biserial coefficient is above the 0,3 threshold while Homogeneity Coefficients of the clusters are all fairly below 1,0. The preliminary interpretation of this solution also confirmed its viability. The only index below the optimal was the modified Xie-Beni index where a local maximum is expected.

Table 2.
Adequacy indexes of the cluster solutions 3 to10

| Step | Cluster N | EESS % | EESS increase | Point biserial | XieBeni (mod) | Silhouette coefficient. | HC mean | HC min - HC max |
|------------------|-----------|--------|---------------|----------------|---------------|-------------------------|---------|-----------------|
| i=984 | 10 | 85,37 | 1,73 | 0,3 | 0,83 | 0,595 | 0,295 | 0,10-0,57 |
| i=985 | 9 | 83,64 | 2,25 | 0,301 | 0,53 | 0,588 | 0,33 | 0,10-0,69 |
| i=986 | 8 | 81,39 | 2,32 | 0,339 | 0,57 | 0,583 | 0,375 | 0,22-0,69 |
| i=987 | 7 | 79,07 | 3,43 | 0,356 | 0,75 | 0,61 | 0,421 | 0,22-0,69 |
| i=988 | 6 | 75,64 | 4,46 | 0,362 | 0,69 | 0,588 | 0,49 | 0,22-0,69 |
| i=989 | 5 | 71,18 | 8,29 | 0,371 | 0,57 | 0,582 | 0,579 | 0,33-0,73 |
| i=990 | 4 | 62,89 | 11,03 | 0,425 | 0,78 | 0,563 | 0,744 | 0,59-0,85 |
| i=991 | 3 | 51,86 | | 0,401 | 0,49 | 0,555 | 0,965 | 0,59-1,45 |
| after relocation | 5 | 74,94 | | 0,375 | 0,763 | 0,671 | 0,503 | 0,47-0,60 |

Notes

EESS = Explained Error Sum of Squares

Point biserial = Point biserial correlation coefficient

XieBeni (mod) = modified Xie-Beni index

HC = Homogeneity of Cluster index

After confirming the appropriate number of the clusters we also performed relocation process in order to let the individual cases fit better their final cluster. Relocation increased the fit of the adequacy indices with the EESS% increasing to 75,64% and also the previously less preferable modified

Table 3.

Descriptive statistics of the clusters

| | Clusters | | | | | | | | | | ANOVA | |
|-------|----------|-------|----------|-------|----------|-------|----------|-------|---------------|-------|-------|---|
| | 1 | 2 | 3 | 4 | 5 | | | | | | F | p |
| | m | SD | m | SD | m | SD | m | SD | m | SD | | |
| MQ-P | 144,48 a | 11,21 | 109,69 b | 11,15 | 125,36 c | 12,09 | 89,25 d | 12,03 | 98,28 e | 13,71 | | |
| MQ-N | 132,16 a | 9,10 | 130,89 a | 9,11 | 106,73 b | 8,80 | 109,40 c | 8,63 | 84,57 d | 9,25 | | |
| MQ | 276,64 a | 14,21 | 240,58 b | 12,86 | 232,09 c | 13,68 | 198,65 d | 14,19 | 182,85 e | 18,23 | | |
| N | 201 | | 195 | | 255 | | 193 | | 150 | | | |
| % | 20,22 | | 19,62 | | 25,65 | | 19,42 | | 15,09 | | | |
| SES | 6,08a | 0,59 | 5,68b | 0,60 | 5,59b | 0,79 | 5,16c | 0,85 | 4,51d | 1,08 | | |
| SWLS | 5,15a | 1,35 | 4,94a | 1,22 | 4,77a | 1,20 | 4,23b | 1,41 | 4,02c | 1,61 | | |
| RSES | 6,27a | 0,63 | 5,90a | 0,89 | 5,70b | 1,04 | 5,10c | 1,08 | 4,76c | 1,35 | | |
| N | 66 | | 93 | | 103 | | 112 | | 77 | | | |
| % | 14,63 | | 20,62 | | 22,84 | | 24,83 | | 17,07 | | | |
| Label | Winner | | Fighter | | Lucky | | Survivor | | Wonder seeker | | | |

Notes:

$N = 994$ for MQ variables and 451 for SES, SWLS and RSES

MQ-P = positive situations, MQ-N = negative situations; MQ = Total MQ score, SES = Self-Efficacy Scale, SWLS = Satisfaction with Life Scale, RSES = Rosenberg Self-esteem Scale

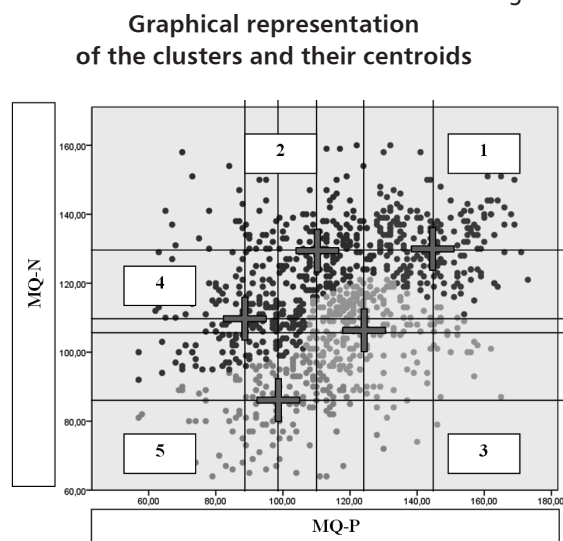
different subscripts for mean scores indicate significant subgroup differences according to the post hoc test with Bonferroni correction

Xie-Beni index increased significantly from 0,570 to 0,763. After relocation the individual cases were assigned to the clusters for further analyses. The proportion of each of the clusters in the sample ranged from 15,09% to 25,65%, thus, it can be regarded as fairly balanced (see *Table 3*).

The five cluster solution

Means and standard deviations of the cluster centroids are presented in *Table 3*. For a more visual depiction we also present *Figure 2* where the clusters are represented in the two dimensional space defined by MQ-P and MQ-N. Additionally, we constructed tentative names for the specific clusters to increase their identity. According to our interpretation, Cluster 1 (N = 201, 20,22 %) is the “Winner” group

Figure 2.



Notes

cluster numbers denote: 1 = Winner, 2 = Fighter, 3 = Lucky, 4 = Survivor, 5 = Wonder seeker (see also text and *Table 3* for the interpretation)

containing those respondents who can uphold an optimistic explanatory style both in positive and negative situations. Cluster 2 (N = 195, 19,62 %) is the “Fighter” group that is high in optimistic explanatory style for negative situations but only medium for positive ones. In an opposite manner, Cluster 3 (N = 255, 25,65 %) represents the “Lucky” ones who are able to make optimistic explanations when events are positive; however, they are less adept when getting into troubles. In a similar vein Cluster 4 (N = 193, 19,42 %) and 5 (N = 150, 15,09 %) are each others’ counterparts and they may be labeled as the “Survivors” and the “Wonder seekers”, respectively. Both clusters have relatively low scores in both sub-dimensions but “Survivors” seem to be a little bit better off with optimism in bad situations while “Wonder seekers” are rather helpless when they experience negative events but are still somewhat more skillful if they encounter positive ones. Obviously, in strict sense these interpretations are valid only for the five cluster centroids, the most typical cases. In contrast, the actual cluster assignment is more arbitrary close to the borders of the clusters.

Comparing the clusters

Cluster membership was used for further analyses as well. To explore the meaning and adequacy of the five cluster solution we compared the groups along a series of other dimensions of positive psychological functioning. We performed ANOVAs to determine how patterns of MQ-P and MQ-N relate to self-efficacy, life satisfaction and self-esteem (see *Table 3*). Post hoc test was performed to check subgroup differences using Bonferroni correction. As a general tendency we may see that higher MQ scores – regardless whether they are composed more from MQ-P or MQ-N item ratings – are associated with more favorable positive psychological functioning. The clearest pattern can be seen for self-efficacy where “Winners” have the highest values as a group, followed by “Fighters” and “Luckies” (between the two latter there was no significant difference in the post hoc test) and then by “Survivors” while “Wonder seekers” as a group have the lowest values (see *Table 3*). Concerning self-esteem, Clusters 1 and 2 (“Winners” and “Fighters”) did not differ significantly and presented the highest mean scores among the five clusters, followed by medium mean scores in the Cluster 3 (the “Luckies”) and the lowest mean scores of Clusters 4 and 5 (“Survivors” and “Wonder seekers”; no significant difference). Although mean scores of life satisfaction followed the general tendency in the clusters, the difference between Clusters 1-3 did not reach statistical significance and can be seen as equally high in these groups. However, mean score of life satisfaction was lower in the group of “Survivors” and even lower in the group of “Wonder seekers”. While these similarities and differences can be interpreted in a meaningful way as we present in the next section in detail, we may emphasize here the general tendency of the results that point to the importance of an integrated and sufficiently high optimistic explanation style for both positive and negative events.

Discussion

To our best knowledge our study was the first to aim at a person-oriented description of the explanatory styles in employees. Since employee well-being is recognized as an important goal of responsible, future oriented leadership and employees with a more optimistic mindset are more capable of maintain their well-being and productivity in the face of adverse situations and challenges, identification of different types of optimistic explanatory strategies may bear with both theoretical and practical implications. First we address theoretical and then practical implications of our research.

In our analysis, we used optimism scores for positive and negative events separately. This approach is in line both with theoretically based conceptualizations that emphasize the patterns-oriented analysis of interrelated but distinct constructs and with our empirical data. Concerning the first aspect, Xin and colleagues argue that different dimensions of self-construal have to be analyzed in a person-oriented way, instead of simplifying them to the two extremes of the same continuum (Xin – Yang – Ling, 2017). Their approach is similar to ours where we

would like to decompose the concept of one dimensional optimism into a more fine graded and person-oriented use of both negative and positive events.

Cluster analysis of the two basic dimensions of explanations, that is, explanations for positive and negative events, resulted in five clusters. We tentatively named them “Winner” (high scores on both dimensions), “Fighter” (highly optimistic explanations for negative events and medium score for positive ones), “Lucky” (highly optimistic explanations for positive events and medium score for negative ones), “Survivors” (moderately optimistic explanations for negative events and low score for positive ones) and the “Wonder seekers” (moderately optimistic explanations for positive events and low score for negative ones). It is important to note that in this sample of well-adjusted, nonclinical adults the resulting solution does not contain a kind of “loser” cluster, that is, a group that scores very low on both dimensions. Distribution of the data allowed rendering all cases to clusters where empowering aspects of explanations are present at least to a certain extent. Cluster memberships and their tentative labels point to the resources of the persons: the most suitable situation is where she can use her characteristic way of explanations the best possible way to increase her functioning and thus increase the fit between herself and the environment (the person-environment fit; c.f., Zou – Zuo, 2015). Looking from the other end of the continuum, we could identify only one group of respondents who integrated both aspects of optimistic explanatory style, that is, responded in an optimistic way to both negative and positive events. We may interpret this phenomenon in a way that there is only one type of truly integrated functioning and it has to contain adaptive strategies for both sides of the human experiences, the positive as well as the negative.

Associations of the clusters with well-being indices reinforce this interpretation. Distinctiveness of the cluster membership was the highest in case of self-efficacy. Stable self-efficacy beliefs are closely related to high performances and functionality and our results contribute to this concept by emphasizing the importance of cognitive flexibility that enables the person to find the benefits in every kind of situations. Consequently, the lower is the summed score in optimistic explanations of any kind, the less advantageous the self-efficient self-regulation can be expected. On the other hand, self-esteem did not differ in case of Winners and Fighters underlining the utmost importance of handling negative situations in the possibly most optimistic way when forming one’s inner image of the self. In fact, self-esteem is closely related to the self-regulation skill of handling frustrations and obstacles. Finally, life satisfaction, that is, the general evaluation of one’s place in life, was equally high in the first three clusters, at least in terms of statistical (non) significance. This may point to the positive interpretation that to run a good and satisfied life it is important to have at least one kind of the explanation at its best. This may help one to find a way of living that fits his or her preferred processing of information.

If we consider the practical aspects of a good and productive work environment, the cluster membership patterns also reveal those aspects of an employee’s functioning that may be the target of conscious development. There are studies indicating that the style of explanations may modify the interpretation and the subsequent action of employees in favourable and unfavourable conditions (Schinkel – van Vianen – Marie Ryan, 2016). At the same time, explanatory style can be changed by cognitive behavioural techniques (Moore – Fresco – Schumm – Dobson, 2017) and a training for more optimistic explanations may be an integral part of burnout prevention (Slavin – Shoss – Broom, 2017). Moreover, intervention induced changes may lead to higher self-efficacy and general well-being which in turn improves the performance and lowers turnover intentions (c.f., Proudfoot – Corr – Guest – Dunn, 2009). MQ Test based assessment of exploratory styles and the corresponding interventions and trainings may help to reach individual and organizational goals simultaneously.

Limitations

Our results have to be interpreted in the light of certain limitations. First, our cross sectional study design does not allow causal explanations of the result. Second, snowball recruitment and self-report online responses may raise concerns toward the validity of the answers. Third, our samples consisted of exclusively Hungarian respondents. Since cultural aspects are important part of the interpretation of negative and positive events, future research can aim at cross-cultural generalizability of different explanatory patterns. In line with this notion, there are research results that show that cultural factors may moderate the reactions to positive and especially negative events; for example, respondents with a Buddhist worldview tended to explain negative events in a pessimistic way, however, this explanatory style did not predict lower well-being for them (Liu – Wang – Peng, 2017). Therefore, separate investigation of both kinds of explanations may provide a more detailed picture on the functioning and significance of explanatory styles. Finally, we focused on positive and negative explanations only, fitting our approach to the measurement domain of the MQ Test. More fine graded methodology and analysis including different aspects of explanations in terms of stability, globality and internality may broaden the scientific power of a person-oriented approach toward optimism.

Conclusions and future directions

Our research showed that characteristic explanations for positive and negative events may be clustered in a meaningful way and that different clusters represent characteristically different ways of functioning. While general well-being levels may be similar for those who are better in taking the best out of the positive situations (e.g., the “Lucky”-s) and those who are at their best when things turn bad (e.g., the “Fighters”), their different strategies reveal a lot about the “how” of reaching well-being. This way, MQ Test provides organizations, business leaders,

HR practitioners and also employees a scientifically reliable and easy to take measure with which the existing explanatory style of the associates can be identified. A reliable and accurate measure provides vital information for leaders and employees concerning the available resources of the employees to cope with adversities and their readiness for change. One of the main potential of our results is the possibility of a tailor made approach toward human resource management and development as well. Therefore, further investigations may refine how MQ Test and the corresponding approach to optimistic mindset could be employed as a training program tool for employees.

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CURVE-BASED E-LEARNING EFFICIENCY GRADING

This study proposes a new method for measuring e-learning efficiency. Efficiency assessment has been fairly contradictory in traditional educational systems. After reviewing the assessment limits of traditional educational systems, the authors used e-learning characteristics to propose a new assessment method based on the distribution of the educational process parameters (and not those of the students' results). They also assign specific evaluation criteria and key indicators that are linked to the parameters of the e-learning process. The essence of the new method is that the efficiency of individual e-learning courses can be evaluated based on standard distribution features on their own and can be compared with similar courses as well.

Keywords: E-learning, efficiency, standard distribution, key figures

"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science." (William Thomson, Lecture on "Electrical Units of Measurement" (3 May 1883), published in Popular Lectures Vol. I, p. 73.)

Management science shares the views above worded by William Thomson¹ regarding leadership, organizational, and management processes. In the business areas created by new technologies, widely accepted measurement systems eventually emerge. E-learning has been used for more than ten years, but it is still a new and highly evolving technology and phenomenon. Researchers are comparing the outcomes of e-learning and traditional education forms, and some forms (namely skill-based courses) outperform traditional education (Callister – Roberts – Love, 2016).

No consolidated and consistent measurement system has been developed in the emerging field of e-learning. Other studies examining the method of student evaluation of teaching efficiency (SETE) have emphasized that emerging online educational methods necessitate the revision of earlier assessment methods (Galbraith – Merrill – Kline, 2012). One of the goals of this study is to eliminate this gap by offering a measurement-rating framework. E-learning provides an opportunity for a unique education measurement system.

We explored the basic requirements of modern performance measurement systems. Based on the identified specificities of e-learning, we propose a measurement-rating framework that exploits the relevant opportunities. The method is based on the statistical distribution of the results of an educational process and not those of the students' results, for which we also assign specific evaluation

criteria and key indicators. The new approach can also be used for comparison with similar courses in no specific environment, thus it can be applied to including but not limited to secondary education, higher education or in the corporate sector.

Differences between e-learning and traditional learning

Guri-Rosenblit and Gros (2011) and Sangrà, Vlachopoulos, and Cabrera (2012) offer a perfect discussion of the basics of e-learning. But instead of providing a long overview, we present the differences from traditional attendance-based (classroom) learning as an important starting point in identifying the shortcomings and possibilities in the related measurements. Based on our findings, there are seven main ways in which e-learning is different from face-to-face learning:

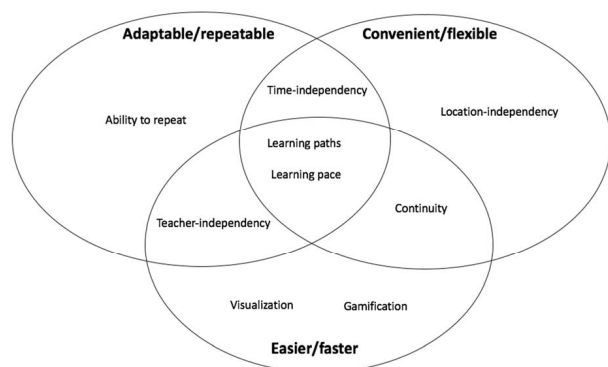
1. *Time-independency.* In traditional courses, students are forced to acquire knowledge at a given time and usually regularly. In case of e-learning, students learn when it is most suitable for them.
 - a. *Ability to repeat.* In traditional courses all students have to pick up and adjust to the teacher's pace. In the case of e-learning, the contents may be consumed at one's own pace, they can also be reviewed at an unlimited number of times.
 - b. *Learning pace.* As a direct consequence of flexible timing, in case of e-learning students do not have to spend the same amount of time studying a given section.
2. *Location-independency.* In the case of e-learning, mobility allows students to choose the place of learning, whether in a public area, park, commuter train or the nursery of a house.
3. *Continuity.* In case of an attendance-based learning, the personal presence of the teacher provides an opportunity for students to ask questions right

¹ Often referred to simply as Lord Kelvin

- away and clarify unclear points quickly. In case of e-learning, this opportunity is typically provided in an asynchronous way (e.g. via electronic messages).
4. *Teacher-independency.* In a classroom, the students usually do not have any options, and they have to accept the teacher in regard to his appearance and lecturing style. E-learning offers an opportunity for creating more teacher-independent content.
 5. *Learning paths.* In a classroom, there might be students who are partly familiar with the content and for whom half of the information conveyed is not new. This means unnecessary repetition. E-learning provides a possibility for the students to choose the content elements they want to learn and to prove the knowledge they obtained earlier.
 6. *Visualisation.* Presentations (mostly PPTs) created for a classroom environment are for guiding the teacher rather than for aiding student understanding, whereas all visual or audio elements in e-learning content serve the student's progress better.
 7. *Gamification.* The classroom environment provides only limited opportunities for competition by solving smaller tasks or distributing good points. However, e-learning ensures a much more colorful toolkit for making learning a game.

In order to have an overview of the advantages' complexity, we created a classification on the findings above, and sorted them into three overlapping categories. Some of the advantages has the ability to make learning *adaptable and repeatable* for the learners. Others create a more *convenient and flexible* environment in the learning process. And there are also some advantages which are capable of making learning *easier and faster*. It is worth mentioning other classifications grouping by high accessibility, flexibility, time and cost/investment benefits (Nesterowicz et al., 2016). (see Figure 1.)

Figure 1.
How e-learning is different from traditional learning



The criteria system above reflects the differences between traditional classroom learning and e-learning very well. In short, students have to obtain new knowledge among conditions in a classroom environment that are forced on them from many aspects and with the teacher being an

important element of education. By contrast, e-learning provides freedom for the student to determine the place, time, pace, and style that are most comfortable or suitable for them, and the teacher's personality is not necessarily reflected directly in the e-learning content.

Why new measurement methods are necessary in case of e-learning?

The primary metrics of traditional education mainly evaluates the student and its obtained grades or assesses the teacher himself (e.g., SETE, which will be discussed) and the latter obviously cannot be applied in the case of e-learning. This is why the traditional measurement system needs to be revised, and an improved system of metrics must be created, which should emphasize knowledge transfer and make it easy to compare e-learning materials with different styles, contents, and topics.

The new measurement system is essential and viable because technology enables it, new areas (not only satisfaction or grades) can be measured unbiasedly without evaluator qualification error. Improving the measurement of traditional teaching efficiency is very constrained, it is difficult to adopt them in connection to e-learning thus with the new metrics comparison with traditional learnings is more convenient. Last but not least the new metrics can be used to fine tune or restructure teaching materials in course design and a continuous improving dialogue can be sustained by evaluating the new indicators.

What do we expect from a good measurement system?

In addition to the educational evaluation requirements discussed elsewhere in this article (Taylor, 2010), there is a list of key principles of correct evaluation for the assessment of performance management systems:

- representative faithfulness: correlation between the measurement and the phenomenon to be measured,
- comparability (via benchmarks) corresponding to the evaluation criteria,
- correlation with other measurement metrics: indices that are compatible with the rest of the areas of business performance measurement,
- clarity: being relatively easy to understand and work with,
- reliability: users can rely on the figures,
- verifiability: a consensus value created between several independent measurements (and people carrying out the measurements); for example, proposal: probability-weighted average of experts (systems).

The further knowledge expected from indices (e.g., Seang, 2003) is:

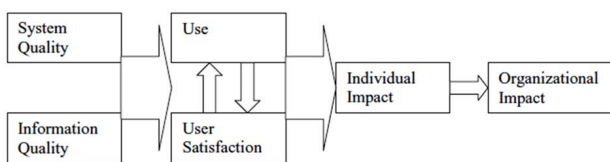
- planning, controlling, and the support of evaluating systems,
- communicability (especially for internal use),

- optimization of resources,
- motivation: performance may improve after defining goals that can be individually performed.

Holsapple, Clyde, and Lee-Post (2006) approach the success of the introduction of e-learning from the perspective of information technology systems. Importantly, in the case of information systems, not only individual effects but also effects on the organization need to be considered (DeLone – McLean, 1992). For brevity, this article deals with only measurements relating to the individual. (see Figure 2.)

Figure 2.

The original information system success model created by DeLone et al. (1992)



Current education-measurement systems and their criticism

In everyday life, the terms “effective” and “efficient” are often not used clearly. This is why it is important to clarify the differences between the terms in regard to knowledge transfer and learning. The difference between these terms is obvious in management sciences:

- effective (adj.): adequate to accomplish a purpose; producing the intended or expected result,
- efficient (adj.): performing or functioning in the best possible manner with the least waste of time and effort (Nelson, 2018, p. 356).

In other words, being effective is about “doing the right things,” while being efficient is about “doing things right.” In regard to teaching, effectiveness refers to the transfer of knowledge as a result, while efficiency refers to the rate of the results achieved and the inputs. Efficiency is also referred as productivity, namely maximizing the quantity of output (number of student and their achievements) while minimizing the use of inputs (Vilaseca – Castillo, 2008).

It is generally acknowledged that e-learning can be a lucrative investment by replacing classroom courses, but in this article, we focus on the aspects of knowledge transfer efficiency (Strother, 2002; Wild – Griggs – Downing, 2002; Vilaseca – Castillo, 2008).

Consequently, a metric system for the efficiency of knowledge transfer needs to be created in the context of the mentioned conditions, of which the quality is rather significant as well. The measurement results could define the ranking of educational institutions or the remuneration of teachers.

According to Tyler (2010), four major criteria must be met when defining a set metric system:

- generalization: the teaching (or teacher) must be measured not once but several times to make general conclusions,
- evaluation: metrics and key figures must be timeless and consistent so that teachers and education can be compared objectively in both time and space, regardless of the topic of education,
- extrapolation: it is important to have a correlation between the metrics and the quality of the education, which means that it must be ensured that the students’ good results and performance are achieved thanks to the teaching method and the teacher,
- implication: the created methodology must be applied as a suitable device, whether in the case of creating a ranking of institutions or in the comparison of people.

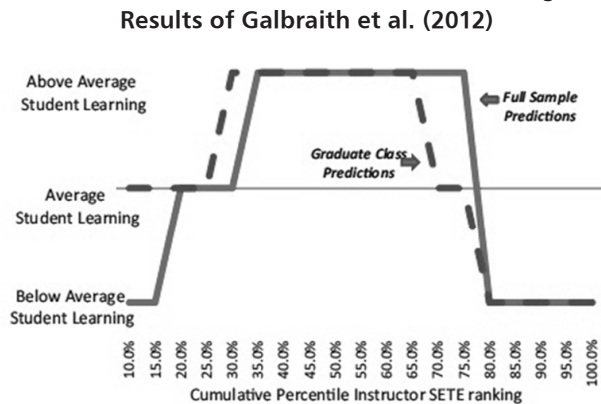
Current methodologies for the measurement of the efficiency of knowledge transfer are not satisfactory according to Creemers and Kyriakides (2006) either. They point out similar results from two studies that were written independently of each other. Colema, Campbell, Hobson, McParttland, Mood, Weinfeld, and York (1966) and Jencks, Smith, Ackland, Bane, Cohen, Grintlis, Heynes, and Michelson (1972) both filter out the students’ background conditions (individual skills, family circumstances) in the samples examined, which resulted in the variance of the teaching factors remaining very low. This means that different teachers and teaching methods have more or less the same efficiency in the case of students with similar backgrounds. Heyneman (2005) also comes to the conclusion that social status strongly determines student performance, however he also examines whether the purpose of public schools are making the performance gap disappear or fostering social cohesion.

Hanushek and Luque (2002) come to the conclusion that student performance is has a connection on how efficient is the use of resources, but comparing both developed and poor countries shows that these problems are independent from the level of resources. Woessmann (2004) points out that in developed countries (such as the U.S. or Western Europe) family-background characteristics have strong effects on student performance. The Tennessee Value-Added Assessment System (TVAAS) is also worth looking at, as it is a good measurement system for teaching effectiveness which controls implicitly for socioeconomic status and background. There are also some experiments and research modifying the TVAAS (e.g. Sanders and Wright (2004)).

One of the most popular measurement methods of teaching efficiency is student evaluation (SETE). A study by Galbraith et al. (2012) shows a counterexample for the relations between students’ results and the teacher’s evaluation not being linear, supporting the claim with various mathematical methods. Students achieving the best results tend to evaluate the teachers as having medium quality, while students with weak performance prefer extremes: they evaluate the teacher either with very good or very bad scores. When examining the SETE method, the authors

also state that new teaching methods such as online courses and hybrid courses have emerged, which makes revision of the SETE method necessary (Galbraith et al., 2012). (see *Figure 3*)

Figure 3.



At the same time, other authors emphasize the fact that the knowledge transfer is strongly dominated by student satisfaction (Eom – Sean – Wen – Ashill, 2006). Ten years later, the model was refined somewhat, and new explanatory factors of student satisfaction were identified, such as course design, instructor, and dialogue (Eom – Sean – Ashill, 2016). Student satisfaction is a defining factor, which is well evidenced by an analysis conducted on a rather large empirical sample, which emphasizes the importance of individual learner characteristics. This means that if these characteristics are filtered out, the remaining learning experience itself is similar for everyone (Li – Nai – Marsh – Bart Rienties, 2016). This agrees with Creemers and Kyriakides (2006), according to whom the observable standard deviation disappears after filtering out students' backgrounds and grades.

Emery, Kramer, and Tian (2003) also criticize the SETE method based on the following grounds:

- *Popularity and personality contests.* Teachers' evaluations are often influenced more by popularity than teaching efficiency. Students' subjective evaluations are affected by simple factors, such as whether the teacher brings food into the classroom for the students.
- *Student achievement.* Although students' achievements are perhaps the clearest and most indirect feedback about a teacher's efficiency, studies supported by examples show the opposite; that is, the teachers' evaluation is reflected in the students' achievement to a minimum extent only.
- *Situational factors and validity.* A relation can be seen between the courses and the evaluations related to them. For example, the authors compare art and science subjects, and there is a difference between obligatory and optional subjects as well.
- *User error.* Incorrect interpretation of the results of SETE or their analysis with an incorrect statistical

method might lead to serious problems as well. Since sample sizes are usually small (courses with fewer than 30 students), the possibility of statistical error is much higher.

- *Evaluator qualification error and defamation.* The last aspect criticizes the students themselves. Students are generally said to not be able to think critically. Evaluators are not pre-filtered in any way, which would entitle them to evaluate the teachers, so intentional defamation can easily occur.

All in all, a large part of the literature criticizes the current methods for measuring traditional teaching efficiency. However, studies attempt to define principles and give recommendations for the improvement of the current methods. Berk (2012) makes twelve recommendations for improving the measurement of teaching efficiency. He lists twelve possible sources from which proof can be obtained regarding a teacher's evaluation:

1. student ratings: the students evaluate the teachers according to a given scale,
2. peer ratings: the teachers evaluate each other on a given scale,
3. self-evaluation: the teacher evaluates himself or herself on a given scale,
4. videos: the teaching is recorded on video and evaluated (by the teacher himself/herself or another teacher/expert),
5. student interviews: students are "questioned" not individually but collectively,
6. alumni ratings: the teachers are evaluated by alumni,
7. employer ratings: the students' employers evaluate the students (and thus the teachers indirectly),
8. administrator ratings: administrators of the educational institution evaluate the teachers,
9. teaching scholarship: examining the scholarships awarded to the teachers,
10. teaching awards: examining the prizes and acknowledgements awarded to the teachers,
11. learning outcome measures via the students' achievements,
12. teaching portfolios, which collect the above via several factors.

Besides the information sources, the list also contains the types of indicators (rating scales, reviews, etc.) and specifies the person it is from, the person who can use the information, and what kind of decision can be made with it. (see *Table 1*.)

Berk's proposals are overly teacher-centered rather than teaching-centered, which means that it is difficult to adopt them in connection to e-learning. Points 1, 6 and 11, however, can also be interpreted in the context of e-learning. Certain teaching features have such a great impact that e-learning can only be a superior mode of instruction if the students specifically like to study in a visual and writing/reading style and receive several kinds of feedback from teachers.

Table 1.

Summary of Berk's (2012) proposals

| # | Source of Evidence | Type of Measure(s) | Who Provides Evidence | Who Uses Evidence |
|----|-----------------------|------------------------------|------------------------------|---------------------------------------|
| 1 | Student Ratings | Rating Scale | Students | Instructors/Administrators |
| 2 | Peer Ratings | Rating Scale | Peers | Instructors |
| 3 | Self-Evaluation | Rating Scale | Instructors | Instructors/Administrators |
| 4 | Videos | Rating Scale | Instructors/Peers | Instructors/Peers |
| 5 | Student Interviews | Questionnaires | Students | Instructors/Administrators |
| 6 | Alumni Ratings | Rating Scale | Graduates | Instructors/Administrators |
| 7 | Employer Ratings | Rating Scale | Graduate's Employers | Instructors/Administrators |
| 8 | Administrator Ratings | Rating Scale | Administrators | Administrators |
| 9 | Teaching Scholarship | Judgmental Review | Instructors | Administrators |
| 10 | Teaching Awards | Judgmental Review | Instructors | Faculty Committees/ Administrators |
| 11 | Learning Outcomes | Tests, Projects, Simulations | Students | Instructors/Curriculum Committees |
| 12 | Teaching Portfolio | Most of the above | Instructors, Students, Peers | Promotion Committees |

We reckon that the current education-measurement systems are neither effective nor efficient because they only and mainly evaluates the student and its obtained grades or asses the teacher himself and a continuous measurement of the latter proves to be time consuming and expensive.

We also reckon that several above mentioned criteria of a good measurement system are not met in traditional education-measurement systems, for example extrapolation and implications just to name a few. Generally speaking the traditional metrics does not properly reflect to the teaching method and knowledge transfer.

Undoubtedly, the students' learning outcome (in other words, the gained competencies) would have to be an important benchmark, but this cannot always be measured well for the following reasons:

1. exams and other grades do not necessarily correlate with actual knowledge,
2. there is no opportunity for actually measuring knowledge and competence during or after the learning process, it is too costly, or it requires too many resources,
3. no knowledge or no exact knowledge is available regarding the students' competence or their input state preceding the learning,
4. the characteristics of the teaching process (e.g., the teacher's personality, teaching intensity, methods used) cannot necessarily be identified or linked to the measured person,
5. performance can greatly depend on current conditions of the student (state of mind, mood, etc.), which can only be filtered out through several measurements, but the opportunities for this are limited.

The somewhat opposing relationship between the teacher's "goodness" and learning outcome mentioned by Galbraith et al. (2012) supports that it is worthwhile and necessary to measure knowledge transfer, even if it is the teacher's performance that is being measured. Based on the above,

it is necessary for the assessment of the teaching system itself to make indirect conclusions regarding the quality of knowledge transfer and for the sake of assessing the teaching process.

The measurement features of e-learning

This section will explain the necessity of a different and improved measurement system for e-learning knowledge transfer. Then we will elaborate on how teaching could be referred to as a service, and how this influences the creation of the improved measurement system. Finally we will point out the change in competence creation in e-learning.

Why should e-learning be measured differently?

The issue of heterogeneity is solved in e-learning. As Unified Service Theory (discussed in the next section) states, the goodness of the process and that of the service cannot be separated from each other (e.g., the quality during the performance determines the quality of the end-product, and there is no final inspection or possibility of a recall). However, e-learning makes teaching repetitive. E-learning affects the two basic approaches of knowledge management: personalization and codification. In personalization, knowledge is rather tied to the teacher who shares it, thus the transfer could vary a lot not only by teachers but also by the mood of the teacher. In codification, knowledge is codified and shared in a standard way, thus it can be transferred over and over again at the same quality level.

E-learning makes a kind of codification possible instead of personalization knowledge management, which undoubtedly reduces the user's vulnerability.

By the nature of e-learning systems, the teacher's personality is less significant. The teacher's personality and his technique for knowledge transfer cannot be disregarded in connection to the creation, editing, and presentation of the content, but due to the recording and presentation of

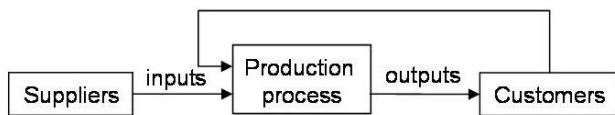
the content, the selection and inclusion of the teacher is less accidental, since the final content can be edited with the best teachers and their best moments.

Teaching as a service

Since teaching is some kind of a service, the Unified Services Theory (Sampson – Froehle, 2006) can be applied. Unified Service Theory (UST) is a fundamental model which incorporates customer’s reaction, feedback, etc. as production inputs. Education belongs to one of the main service areas according to UST (Sampson, 2001). The theory names „mind” the input from the customer. The customer feedback part of the model is a very relevant and important in teaching value process too. We use UST as a starting point to set up the measuring framework for e-learning processes because the goodness of the process and that of the service cannot be separated from each other in education. (see Figure 4.)

Figure 4.

Fundamental model of service business operations (Sampson, 2001)



Besides the “mind” mentioned by Sampson as customer feedback during education, the following factors also need to be considered:

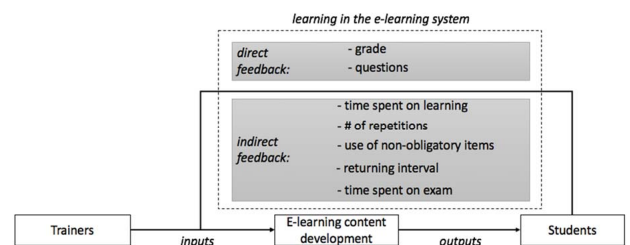
- Grade.
- Time spent in the course: if a student is there for a long period of time, she either understands it slowly, or either enjoys it very much.
- Average time between returning to the course: if a student rarely returns, the student does not enjoy the e-learning material or is not motivated enough to return more frequently. Although we should consider this carefully, because the reason of the rare return could be that the student doesn’t need to return to the course.
- Number of breaks in the course (how many returns are necessary to complete the entire course): if a student takes many breaks, then the breakdown of the syllabus should be considered to be changed, given that not only one but the majority of students take many breaks.
- Utilization frequency of complementary educational elements (explanatory additions, list of lists, notions, etc.): if elements are used frequently, it is good; if they are not, then they are useless. However, the core syllabus could be shortened and would thus require little explanation.
- Number of questions asked by the students: if there are many questions, the material is probably not understandable.

- Time allocated for the exam (in proportion to the total amount of time permitted as a percentage): if the time is low, the exam is easy, or if there is much time, there is also feedback.

The Figure 5. summarizes the information above. This classic figure should also contain the grading, interactivity, questions, everything we refer to below, and the statistical evaluation mode. We once again refer to these factors at the end of the article in the key figure section that we recommend.

Figure 5.

Extended model of service business operations

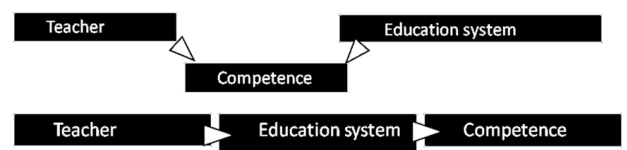


The connection between the measurement areas

In the case of traditional attendance-based learning, the delivery of knowledge is influenced directly by two factors: the teacher has a direct impact on the students since he or she is delivering knowledge during the training and directly participates in formulating the learning competence. In addition, the educational system has a direct impact on the formulation of competence since it determines teaching and knowledge evaluation regarding “where,” “when,” “what circumstances,” and “what to re-examine.” (see Figure 6.)

Figure 6.

Change in competence creation in e-learning



However, in the case of pure e-learning, the student does not interact with a teacher directly. The teacher assists in forming the educational system and contributes to it. The teacher provides the professional content, which is incorporated into the e-learning system during the syllabus development, but does not set the learning pace. The teacher’s personal and educational features are not reflected directly in the competence formulated. This means that eliminating the teacher’s direct connection should affect the metrics as well.

A recommended measurement system for e-learning

This section introduces a measurement system for e-learning courses. We have already defined the characteristics and requirements of a good measurement system earlier, and now we propose the following system of metrics. For the evaluation of e-learning, we divided the measurement possibilities into the following sets of factors.

Areas of measurement:

- the teaching material itself (curriculum),
- the learning management system; that is, the quality of the supporting processes (administration, etc.),
- the transfer of the teaching material.

In this article, we focus on the transfer of teaching material, which can further be divided into the following areas:

- the teacher's rating,
- the measurement of the obtained knowledge and competence,
- the process of teaching (knowledge transfer).

These three factors cannot always be separated from each other, and certain evaluations (e.g., "the teaching was effective") may include all three. In spite of this, it is important to separate them since we cannot measure beyond SETE or without it in a direct way and because of the mentioned difficulties of evaluation.

Our basic approach is that descriptive statistical key figures may be useful for making indirect conclusions in e-learning due to the large number of the same teachings that can be viewed as homogeneous, and not the direct or absolute values. We propose the use of different key figures of volatility and standard deviation to make deductions regarding the goodness of the process by creating divergence.

Repeating the same course may improve the goodness of the deviation creation compared to the general population due to accumulated values of historical data. To gain an idea about the standard deviation, the type of distribution needs to be clarified. The distribution of the teaching performance (efficiency in this case) is typically normal. The reason for this can be found in the following: the distribution of grades is determined by (1) the performance of the students and (2) the grading system.

The student performance is normally distributed. The question is: should the teacher's system distribute grades normally? If student performance is normally distributed, a standard distribution is the outcome of many small variations in inputs that are added up. Student performance depends on many independent factors, such as preparation, education, timing, intelligence, and other circumstances on the day of testing. Several of the mentioned factors are normally distributed by nature. However, according to the central limit theorem, when independent, random variables are added, their sum tends approaches a standard distribution (a Gaussian distribution or bell curve), even if the

original variables themselves are not normally distributed. Besides grading on a curve, which automatically ends up in a bell curve, a consistent or absolute grading system will still lead to a standard distribution because another normally distributed factor is added to the system.

Apart from the above, a standard distribution is very important in teaching. Grading on a curve (also referred to as curved grading, bell curving, or using grading curves) is a method of assigning grades designed to yield a Gaussian distribution curve among the students in a class. If we can assume a standard distribution, then there is a question of why it is worth using for evaluation purposes. Firstly, the shape of the standard distribution can be changed to a certain extent, and therefore, the efficiency of knowledge transfer can be improved. Kronholz's (2012) article is a good example, which examined the issue through the popular Khan Academy. According to the author, a Gaussian distribution can be shifted to the right.

Our assumption of normality seems to be a possible basis for a unique measurement system for e-learning. We suggest applying this theory to the mentioned goodness of the teaching process itself, and not simply final grades. Namely, any deviation from a "standard" distribution correlates with achievements and efficiency of the teaching system; that is, the parameters of the e-learning process and their numerous application cases that can be recorded relatively simply provide the possibility of comparative analyses.

The deviation from the standard distribution as a measurement system satisfies the measurement requirements listed above for the following reasons:

- every participant and course can be evaluated through it, and as such, it is representative,
- because of the obtained data, it is comparable in terms of both time and various courses,
- the parameters of the educational process are clear and communicable for both teachers and students,
- they are reliable and verifiable since they are set automatically without any subsequent manipulations or complicated activities for establishing key figures,
- the creation of the key figures does not require any significant efforts; the process parameters simply need to be recorded,
- objectives can be assigned to the key figures (planning and motivation criteria) and can be monitored on a continuous basis.

The normal bell-shaped curve describes the distribution of randomly occurring events when nothing intervenes. Teaching is an intervention and a purposeful and intentional act. We engage in teaching to attain a specific result—that is, to have all students (or nearly all) learn the things we set out to teach. If the distribution of student learning after teaching resembles a normal bell-shaped curve, that, too, shows the degree to which our intervention has failed. It has made no difference (Guskey, 2011).

The fact that a course's educational process follows a normal distribution gives us an opportunity to measure edu-

ational effectiveness. The basis of our suggested method is that we can record, measure, and quantify the activity and participation of students in e-learning courses. As there are many students in a course, these records result in unique distributions. If a given indicator's distribution does not follow a normal distribution (and is thus distorted somehow), then it has consequences in terms of the goodness of the educational process. Therefore, the results of a simple normality test and distribution analysis could represent the goodness of an e-learning course. Furthermore, if the given course has been repeated multiple times, then the indicators could be compared to each other within the base population.

Specific indices

As mentioned, the topics of the subject and the evaluation of the teaching material exceed the scope of this article. As an example, we mention that usefulness belongs here as the most important concept, just like the question of whether conceptual or procedural knowledge (internalized, actively used knowledge) has been successfully created. This article does not examine the learning management system, which is the quality of the supporting processes (administration, etc.). At the same time, due to the methodological similarity, it is worth mentioning that because of the normality assumption, it is obvious that we propose an indicator of this field: the number and ratio of individual, deviant, problematic cases compared to all the cases.

The use of SETE is obvious and unavoidable since the student's evaluation cannot completely be substituted with indirect calculations. Although we criticized the use of SETE earlier, our main argument is that using only SETE (and nothing else) will end up in distorted results and conclusions when measuring knowledge transfer efficiency. As mentioned, indices are necessary as completing SETE as well. Based on this, we propose using the following:

1. The clarity of the teaching material, provided that it is independent from the subject itself to some extent; with the proper teaching method, even difficult issues can be made clear:
 - a. the standard deviation of the groups' achievements compared to the average standard deviation of teaching,
 - b. how frequently course elements and explanatory materials are visited/reused,
 - c. the frequency of questions (FAQ, the use of supplementary, interpretive materials).
2. Student satisfaction, which is mentioned by several authors and is needed for utilization due to attention scarcity
 - a. time of quitting each course or the time of certain lectures planned in a single block (i.e., time spent on studying/full learning time, or rather, its average),
 - b. average learning fragmentation (i.e., how many times the complete material is viewed by a student),

c. average returning time (how much time passes before the student re-enters after exiting).

3. Learnability (regarding content and quantity)
 - a. the ratio of students successfully passing the course compared to similar key figures of other (attendance-based) courses,
 - b. time spent in the system (provided that the session is interrupted in the case of inactivity).
4. The goodness of examinations (availability, conformity, evaluation, etc.)
 - a. the ratio of good answers to questions compared to the whole,
 - b. the standard deviation of the time spent on questions,
 - c. the representativeness of exam questions compared to the complete material (even distribution of questions).

In the case of SETE, a question arises regarding the extent that students can separate how interesting, useful, or compulsory a given course is from other evaluation criteria. In the case of the above key figures that are independent of SETE, there are no misleading connections when calculating differences and standard deviations. We hypothesize that the standard deviation will be low in the case of good learning methods.

The key message is that the key figures based on the deviation from the standard distribution correlate with achievements and efficiency of the teaching system. Thus, the e-learning process parameters listed above provide the possibility of simple and reliable evaluation that gives feedback for future course planning and development.

Validation plans

As a next step, we intend to validate our proposed method. To do so, we have already approached three large online e-learning content providers (Massive Open Online Courses, a.k.a. MOOC, including but not limited to Coursera with 33 Million learners², Udemy with 80,000+ online courses³) asking for help in gathering the necessary data. As these courses are taken by a very diverse and huge number of learners, and also most importantly by free will, we consider them appropriate data sources to validate our concept with.

These MOOCs are offering online e-learning courses containing mostly videos, some complementary text-based knowledge, related articles and evaluation questions. The students also have the opportunity to take notes during the videos, or ask from the teachers at any given time. Some courses, or a series of courses can grant an official degree after a successful completion, which gives proper motivation for the students.

When we approached these online content providers, we asked for data according to the students' exams (results, time spent on questions etc.), their statistical behavior during learning (number of course access, time spent on course, average returning time etc.), and also their subject-

² <https://about.coursera.org>

³ <https://about.udemy.com>

tive ratings on the course. We asked the content providers for the data to be extracted and sent to us anonymously, so the students could not be identified.

After collecting the data explained above, we intend to perform the calculations detailed in the “Specific indices” section, and compare the results between the courses, the results of the students and also with the student ratings on the courses. Among others, we will examine the distributions of the samples, and plan to do several correlation tests. Also, we are planning to carry out measures of goodness of fit.

After performing all the tests above on all the courses we gather the data from, we hope to come to the conclusion that our concept on measuring the efficiency of e-learning courses are valid and ready to further use and improvement.

Conclusions and outlook

We have faced several dilemmas, and one of the most important issues is whether we should meet special customer satisfaction at all. Obviously, we should to an extent, but we have to differentiate between certain types of education. There is compulsory and facultative learning. In the first case (like in public education or obligatory corporate training, etc.), customer satisfaction occurs on a higher level (at the society or company level; e.g. in KPIs⁴), while in the latter case, it occurs directly at the student level. However, a proper measurement system seems to be essential in any educational process. Our proposed method aims to satisfy this principle. A measurement method based on the standard distribution of automatically recorded educational system results (and not appraisals directly from the students) adds new opportunities to evaluate the e-learning process.

Further research could collect and analyze several samples to test the proposed evaluation method and key figures in this paper can be tested. By proving the independence of the measurement system, we intend to perform the test reasonably on e-learning solutions used in public education and the corporate sector. The results of future research may prove to be useful and challenge the idea that e-learning can deliver knowledge that is more efficient than traditional courses in classrooms. If the bell curves show a left-skewed distribution (negative skewness), e-learning education would prove to be efficient.

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⁴ KPI: Key Performance Indicator

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STEPHAN KÜHNEL

USE OF ONLINE LEARNING FOR CONTINUING PROFESSIONAL EDUCATION AND DEVELOPMENT BY GERMAN AUDIT COMPANIES

This paper presents results of an empirical research project on the status of Online Learning from the Perspective of German Audit Companies (Big4 and Next10). The theoretical basis links elements of knowledge management and professional service firms (cf. Kühnel, 2002; Farkas – Kühnel, 2016). Results are based on interviews performed by the authors and representatives of the firms. Conclusions on the future structure of Continuing Professional Education or Development initiatives may be drawn from the study.

Keywords: professional service firms, auditing, knowledge management, continuing professional education, continuing professional development

The business environment for audit companies can be characterized by technological advancements, complex expectations and demands formulated by the public, the profession and by clients (cf. Abbott, 1988; Freidson, 1994, 2001; Westermann–Bedard–Earley, 2015). These conditions have an implication for the design and implementation of continuing professional education and development. Technological advancements (e.g. digital technologies) and methods of distributed knowledge sharing¹ offer new ways of addressing the needs of audit companies.² We have encountered a significant interest in virtual forms of communication in practice.

The objective of this paper is to identify the use of Online Learning³ in the context of continuing professional education and development initiatives as well as implications for future activities. Our focus is on audit companies operating in Germany. Typically, audit companies use a globally standardized audit methodology which is then adapted to local regulatory requirements.⁴

Methodology is based on semi-structured interviews with representatives of different audit companies (two Big4 and two Next10 firms). This article contributes to the existing literature by giving an empirically founded overview of this field of application to this very current topic.

Continuing Professional Education vs. Continuing Professional Development

We will use the two concepts of *Continuing Professional Education (CPE)* and *Continuing Professional Development (CPD)* with a specific meaning. As audit is a regulated industry that is governed by public oversight⁵ and a public authority⁶ that controls the profession, CPE will be used in the context of staff acquiring knowledge and skills prior to admission to the profession. The reason for this approach is that there is a defined body of knowledge and skills that staff should acquire, typically during the first three years of practice. Professionals on the other hand have a greater discretion⁷ in structuring their initiatives so that they may represent a different target audience. We will refer to Continuing Professional Development

(CPD) in this regard.⁸ Offers for professionals vary in scope and length.

Company-specific initiatives as the starting point

The audit companies covered in this study are two *Big4-Companies* and two firms that are members in *international networks* of audit companies. As both authors have been working in the industry for a couple of years, we assume that there are benefits to be gained from an international coordination of learning efforts. In the end, *experience in the field of expertise* is the basis for working in the profession.⁹ This line of thought leads us to consider company-specific approaches at the heart of the study.

Types of Online Learning

In this paper, Online Learning shall be distinguished in four alternative types: (i) *Virtual Classrooms* transfer the concept of traditional lectures into the virtual world, i.e. there is a lecturer or moderator taking charge of the event. Typically, a virtual classroom session is performed live (i.e. synchronous with participants' interaction) and recorded for later retrieval. (ii) *Web-Based Trainings* describe measures that are asynchronous, i.e. participants can choose the time and location of their trainings based on their needs. (iii) *Blended Learning* is a combination of traditional classroom lectures and online learning, the latter mostly in the form of Web-Based Trainings.¹⁰ (iv) *Micro Learning* is concerned with small pieces of information that is aligned with the respective company's audit approach. For example, when performing audit procedures on Revenues and Accounts Receivables, Micro Learning will show how to do that. Typically, a reference to professional standards and a short video that highlights important aspects are part of it. An alternative description of Micro Learning for our purposes is *Learning on Demand*.¹¹ The timing and the environment for the learning situation are selected by the learners themselves. While other approaches to learning may focus on today's knowledge and

skills that will be applied to a problem or specific situation in the future, Learning on Demand is about the acquisition of knowledge and skills when it is relevant for solving a specific task. (v) *Other forms* of Online Learning can be game-based approaches¹², simulations¹³ or similar tools.

Research Question

The four categories described in the previous section have been used to capture the *status quo* in the respective audit companies. We also asked for *expected changes* in the future. This serves to (i) to identify planned steps in this direction but also (ii) to discuss expectations independent of current plans for implementation.

Influences on contents and process of online learning programs

The *content* of Online Learning is determined by *professional standards*, needs of the *companies* as well as *individual preferences* of the participants. To identify how the content is shaped by the respective influences, we asked to rate the influences. Furthermore, we hypothesized whether professional standards play a specific role in this context and whether multiple professional standards – e.g. on a *multinational client engagement* that is subject to regulatory influences from different countries – pose a specific problem.

Measurement of learning outcomes and related influences

As international professional standards allow for *output-based* as well as *input-based measurement* of learning outcomes, we inquired the current practice in this regard. It should be mentioned, that German audit standards currently favor input-based measures.¹⁴

Factors of influence on the conceptualization of Online Learning initiatives are identified. This relates to the specific forms mentioned previously, but also to general aspects of the learning process of participants. In addition, there is a specific topic related to off-the-job trainings versus current client engagements. We asked for methods to allow junior staff (prior to the completion of the professional exam) to focus on the contents of the learning initiatives and while serving urgent client matters. We also used the opportunity to identify general aspects of learning behavior of participants. They shall be revisited in a different research project in the future.

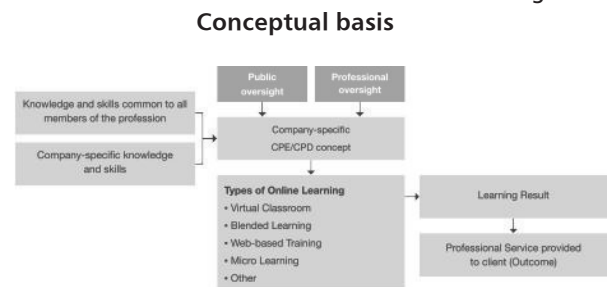
Overview of the conceptual basis

To summarize our thoughts presented in the previous section, we now present a *graphical representation* of the major conceptual building blocks that serve as the basis for this paper. (see *Figure 1*.)

A significant difference to other knowledge-intensive firms (*Alvesson, 1995*) is that the profession as well as public oversight represent *constraining influences* on the design and actual functioning of a CPE/CPD concept.¹⁵ Online Learning currently only represents one aspect of CPE/CPD initiatives, so it cannot be properly understood

without considering the elements. As audit is based on *expert-knowledge* – whether on the application of a specific methodology or industry specifics – the “acid test” for the effectiveness of the learning initiatives will be learning outcomes that are put to the test in the respective client engagements.¹⁶ We assume that clients are typically knowledgeable about accounting regulations and their business as well, i.e. they are able to at least partially evaluate the quality of the performance of an audit.

Figure 1.



Source: own construction

Methodology

This is an exploratory study that uses a qualitative design and focuses on German audit companies. Results of this study shall be used in future research projects.¹⁷ Data has been collected using semi-structured interviews.¹⁸ This allows to combine set questions with additional inquiries to make use of the interviewees’ expertise and get a more comprehensive picture of their points of view. The choice of methodology was also guided by the need to enable an open discussion with participants. The interview guidelines were subject to a pretest that has been completed with audit company staff responsible for CPE/CPD. The focus of the pretest were understandability and duration of the interview. It also served to cover aspects of completeness from the audit companies’ perspective. Formulation of items in the interview guidelines follows usual procedures.¹⁹

We have contacted representatives of selected audit companies. Participants in this study are two Big4-Companies and two smaller companies that are part of an international network. Interviews have been held in Germany in the period November 2017 – February 2018. With one exception, they were performed on site with the relevant contacts at their company’s premises. We made sure that people in charge with the Company’s CPE/CPD offerings took part.²⁰ Interviews lasted between 45 minutes and three hours. Guidelines have been presented to interviewees during the communication in writing. This allows participants to follow the structure and logic of the entire interview.

Where appropriate, we reviewed additional documents and gained access to materials and tools used by the audit companies. Typically, we arranged for a second meeting to follow up on certain topical aspects and to make sure that our understanding was correct. The exception mentioned

before relates to a Non-Big4-Company where the structured interview has been performed via telephone and an additional meeting was arranged afterwards.

Both authors have experience in the field, ranging from seven years online teaching in an academic field to related practical work in a Big4-Company.

Results

Types of online learning

The *typology of Online Learning* is used to structure results. It should be noted that we have received answers from *four companies*, the Table 1. lists their responses in absolute terms.

Table 1.
Types of online learning currently used

| | Virtual Classroom | Web-Based-Trainings | Blended Learning | Micro Learning |
|------------------------------|-------------------|---------------------|------------------|----------------|
| <i>Target audience</i> | | | | |
| CPE for future professionals | (1) | (4) | (2) | (2) |
| CPD for professionals | (3) | (4) | (1) | (1) |
| <i>Contents</i> | | | | |
| Accountancy21 | (1) | (4) | (2) | (1) |
| Audit methodology | (1) | (4) | (2) | (3) |
| Information technology | (2) | (4) | (1) | (2) |
| Soft skills | (1) | (1) | (2) | (0) |

Source: own construction based on interview results

Table 2.
Types of online learning expected in the future

| | Virtual Classroom | Web-Based-Trainings | Blended Learning | Micro Learning |
|------------------------------|-------------------|---------------------|------------------|----------------|
| <i>Target audience</i> | | | | |
| CPE for future professionals | (1) | (4) | (4) | (3) |
| CPD for professionals | (4) | (4) | (3) | (3) |
| <i>Contents</i> | | | | |
| Accountancy22 | (3) | (4) | (4) | (1) |
| Audit methodology | (2) | (4) | (4) | (3) |
| Information technology | (3) | (4) | (2) | (2) |
| Soft skills | (1) | (1) | (2) | (0) |

Source: own construction based on interview results

When analyzing the answers from the four companies, all types of online learning are currently used. A literal translation of the “classic” lecturing model in to the virtual world as in the virtual classroom approach doesn’t seem

to be very beneficial. Two companies expressed an explicit opinion that Online Learning will replace traditional classroom-based formats in the future. This suggests that Online Learning is only partially seen as a substitute and probably more as an additional approach that shall be incorporated into CPE/CPD initiatives.

Web-based Trainings, Blended Learning and Micro Learning have *arrived* and are *relevant* in practice. *Web-based Trainings* appear to be the most common approach for the audit companies included in this research. All of them use this type of Online Learning and intend to continue to do so in the future. *Micro Learning* is currently only partially used, with a focus on audit methodology. For the future, the use of Micro Learning can be expected to grow. There is one potentially surprising result: Micro Learning is not a favored tool for accountancy topics. It should be kept in mind that the rate of change of contents observed in practice may be a relevant factor for this decision.

Another point is that *soft skills* are not considered important for Online Learning. While there was expressed interest in this format, the application is seen as limited. All participants referred to *real-life interactions* with colleagues other but also with clients which currently can’t be adequately transferred into the virtual world.

Other types of Online Learning have been inquired, however there was no clear indication of a common basis. Two companies are experimenting with *gamification* approaches. Similarly, the option to provide learning opportunities for *mobile devices* (i.e. Apps) has been discussed, however there were no clear benefits from the perspective of the companies inquired. (see *Table 2.*)

Contextualizing online learning

Continuing Professional Education is based on an introductory offline teaching format that typically lasts for two weeks during the first years for all participating companies. Common elements are the theoretical building blocks Accountancy (German GAAP²³ and IAS/IFRS) as well as Audit Methodology. The entities combine *teachings* with *case studies* to apply the knowledge in a real-life setting. Typically, the cases are derived from actual client situations that have occurred in the past and are of general relevance to the learners. Online support may be in the form of *introductory material* for preparation. However, it should be noted that this was not common practice. *Follow-ups* to the offline classes was organized in all entities. Some used selected Web-Based Trainings for this purpose. All referred to their company’s Quality Management System²⁴ which mean that junior staff’s performance is reviewed on the job in a specific client engagement where the knowledge and skills are applied. Web-Based Trainings may also be used as a “reminder” to keep learned skills current. This description should not be interpreted to imply that there is no room for online learning without offline backing.

Micro Learning initiatives are typically built around a theoretical base that is presented and at least one application scenario or practice case. From a timing perspective,

opinions on Micro Learning differed: while some respondents favored short and focused contributions (approx. 5 minutes duration) others opted for more context-relevant information that requires approx. 20-30 minutes. Of course, several Micro Learnings may be combined into a learning session by participants, as their work schedule suggests.

When looking at *professionals*, the use of Blended Learning approaches and Web-based Trainings was not seen as a general issue. Participants have an adequate basis of knowledge and skills they can build on. They have also acquired methods to structure their work appropriately. From the contents side, participants emphasized the need for updated professional knowledge, i.e. all the companies inquired have provided corresponding formats – either in an offline format or using online learning tools (e.g. Web-based Trainings).

Advantages and disadvantages of online learning

Asynchronous learning mechanisms offer *flexibility*.²⁵ Virtual tools like Web-Based Trainings and Micro Learning are *independent of the place* where the staff is currently located.²⁶ Certain aspects may even be researched by participants when they are faced with an issue at their client's premises. Furthermore, participants can select the content as they feel is appropriate. Of course, there are limits to the amount of selection, as especially for CPE there is a defined curriculum that must be covered in a certain period of time.

Participants have a greater choice in *selecting the timing* for their CPE/CPD. There was a disagreement between interviewees whether participants must be able to “reserve” time for their learning in advance. This disagreement only relates to Web-Based Trainings and Micro Learnings. On the one hand, there were concerns that if participants cannot block time for their learning, there is a risk that this activity will not be performed at all or without the proper depth. This might be addressed by allowing participants to schedule certain web-based trainings and micro-learnings in their time planning system in advance. I.e., the time for these types of Online Learning are effectively blocked for other tasks. On the other hand, there was the assumption that there are times during a client engagement where there is less work, so this “slack” may be effectively used for Online Learning. Micro Learning has the potential to be *integrated* or at least *linked* to the audit methodology.²⁷ This allows staff to participate in learning initiatives when needed based on their respective workflow. An example would be the preparation for the next day's audit work.

Especially when looking at junior staff (i.e. CPE), there were some concerns that current online learning tools *reduce complexity too much*. This suggests that Online Learning may present *limits on the complexity of the subject matter* that can be addressed. We have been indicated that a “bit by bit” approach to addressing a complex problem may result in solutions that are not sufficient. I.e., the

full amount of implications of a decision may not be captured by participants. However, a potential solution to this issue has already been presented to us in the combination of virtual and non-virtual forms of interaction. While the first may present benefits in structure and detail, the latter should be used to map the knowledge and skills acquired. In other words, when the objective is a deeper understanding, non-virtual forms of learning are considered more favourable.

Areas where online learning is deemed not appropriate

While there are indications of an increased use of Online Learning in the future, the intention was to better understand the limitations for this development. Therefore, we inquired for what purposes or in what situations the audit companies would not use Online Learning.

In *Virtual Classrooms*, there may be a tendency that the initiative is taken by a subset of participants only. We have been communicated that in a meeting of 30 participants, it is not unusual that only two or three individuals are effectively taking action. This suggests that Virtual Classrooms are potentially less suited for an exchange of ideas or experiences. In other words, technical conditions of the classroom limit the type and format of communication.

Applications or contexts that require a significant amount of interaction may be better performed in a local office. Examples given by the respondents relate to *Soft Skills* as content, and to the development of *judgments* on topics that are not covered in the literature or by a similar known case. The same applies to *professional skepticism*.²⁸ The International Auditing and Assurance Standards Board (IAASB), the International Ethics Standards Board for Accountants (IESBA), and the International Accounting Education Standards Board (IAESB) have jointly published a report (*cf. IAASB, 2017b*) where they emphasize this skill as being central to the performance of an audit.²⁹

Leadership-related issues that relate to the interaction with clients and team members, e.g. in resolving a dispute, are also seen critically by the respondents. The same applies to processes of self-organization in a group of auditors, e.g. in the context of problem-solving. The application of the knowledge or skills from an online environment to the real world is seen as too far away in practice.

Taking an *investment perspective*, there needs to be a certain financial return on Online Learning initiatives. Respondents clearly favored the application of Online Learning to methodological questions of the audit in contrast to accountancy-related topics. The examples given indicate that companies wanted to focus on contents that is more or less stable over time. Frequent changes in regulations do not encourage the companies to invest in Online Learning as such. However, it must be kept in mind that Online Learning presents an opportunity for standardization. So that certain topics could be used by entities in other countries.

Determining the need for online learning

When considering the content dimension of Online Learning in auditing and accountancy, one should keep in mind that there is *Common Body of Knowledge* that staff preparing for the professional examination(s) must acquire. This results in a high number of mandatory courses or content in the CPE segment. On top, participants can select offers as needed or as coordinated with their direct superiors. Here, practically all companies hinted that there is a *competition on available time* between chargeable hours on a client engagement and non-mandatory contents. As indicated in the previous section, there were disagreements on whether this competition needs to be formally managed by the company.

Mandatory content is followed up, typically by HR. The objective is to make sure staff participates in all mandatory formats in a certain period (in general, less than a year). One should also keep in mind that mandatory types of learning are part of the audit company's quality management system. This implies that a supervisory body can (and does) *inspect* a company's compliance with the respective regulations. As all companies subject to this study are part of an international network, we inquired whether demands formulated by *different regulators* resulted in a conflict for the respective company. This was not the case: Respondents pointed to a coordination between the supervisory bodies that resulted in similar checklists being used. However, there could be differences in timing, i.e. when changed requirements become effective. In the end, this was not seen as being problematic.

Mandatory content is typically developed based on the general field of knowledge relevant to the profession. More specifically, several organizational units within a company cooperate to select the mandatory content in practice. This includes human resource, *professional practice departments* (at least one related to audit methodology and one related to accountancy). Furthermore, a discussion of needs with *audit staff* and colleagues at the *leadership level* (partner/director) takes place.³⁰ Inputs are *business developments*³¹ that need to be reflected in the audit approach and *results of reviews*, i.e. areas where a lack of knowledge or skills applied to a specific case has been found in the past.

Non-mandatory content is typically developed along the same lines, however the benefit for participants is that they are free to choose the respective contents and – to a certain degree – also the amount on non-mandatory learning.

The *minimum time budget* available for both mandatory and non-mandatory learning is governed by demands of the profession, i.e. forty hours per year for German statutory auditors.³²

Evaluating online learning

The measurement of the output of Online Learning initiatives is a complicated by German legal requirements. International professional standards allow to choose between focusing on input factors to learning (time spent) and output factors (what has been learnt). German law

prohibits the evaluation of learning results at the individual level below management rank which complicates the matter. In most cases, this leads to a practical absence of output controls. We have been communicated what seems to be an acceptable alternative to the problem of a lack of direct output controls. The approach requires a third party to take control of the learning output (i.e. test results). Staff communicates when they start a learning initiative and when they have finished it. Typically, the latter is combined with a certificate that is used as evidence. The audit company doesn't have current knowledge on the individuals' learning output and can only identify the successful completion of tests or tasks.

An evaluation of the output from Online Learning, i.e. acquired knowledge and/or skills can be performed by *answering questions* or performing related tests of knowledge or by *solving problems* that require the application of certain skills. It may be desirable to change the context of the examples presented in the test format from the learning situation. This allows to verify whether a transfer of the output to another situation is effectively performed. While Blended Learning and Web-Based Trainings generally have a wider scope, performance evaluations discussed with respondents suggested that Micro Learning is mostly used for communication of factual knowledge. It has a defined field of application, limited time and also reduced amount of contextual information.

In the audit profession, it is customary to differentiate between the learned knowledge or skills and their application in day-to-day work that is subject to a *quality management regime*. In other words, in addition to the measurement of output, companies can evaluate the application of knowledge or skills in practice. When reviewing working papers managers, partners or others can verify whether knowledge and skills have been appropriately applied. This represents the outcome dimension from knowledge acquisition, i.e. the delivery of a professional service.

Factors of influence that trigger the effectiveness of the transfer from Online Learning initiatives have been identified by respondents as absence of *time pressure* or stress, *acceptance* of the need for learning and the availability of *support* from colleagues and superiors.³³ Of course, related *materials* like a database with regulations and example cases from the past is a further requirement for a successful transfer.

Discussion

This study is based on *semi-structured interviews* with representatives from four audit companies. This approach encompasses inherent limitations towards reliability. However, we chose the approach to get a better understanding from the respective company's point of view on Online Learning.

Probably specific to the industry is a clear-cut distinction between the contents of knowledge acquisition before and after completing the *professional exam*. CPE initiatives had a much higher proportion of mandatory content than later CPD initiatives for professional. For both

groups there is a minimum of time to be used for CPE/CPD. Online Learning promises to bring an enhanced flexibility to the audit companies' programs. Especially, Web-Based Trainings and Micro Learning can be performed whenever there is sufficient time available from the user's perspective.

Online Learning has arrived in practice. There were clear indications for intentions to *broaden the use* of Online Learning tools when looking at responses to the typology presented in this paper.

Quality concerns regarding different types of Online Learning have been identified in this study. While there are clear *advantages and disadvantages* per type, Online Learning in general seems to require the use of multiple approaches in combination. It remains to be seen whether this is due to an experimentation phase or whether is going to be a permanent development.

Probably surprising to the reader are *legal problems* related to the evaluation of Learning Initiatives in Germany. We have tried to sketch the issue in brief terms and described an approach that may be used to comply with the requirements. This situation is certainly not beneficial from the researcher's point of view attempting to identify influences on learning result. It should be noted that voluntary participation of individuals in the evaluation of Online Learning Initiatives is not restricted by the German legislation.

It is our understanding that Online Learning offers a significant amount of research opportunities with use case for practitioners in audit companies.

Conclusion

This paper has presented Online Learning as currently practiced in the selected audit companies. The *four types* of Online Learning (Virtual Classroom, Blended Learning, Web-Based Training and Micro Learning) proved useful in characterising the approaches in the respective companies. We have identified *influences* on the design and implementation of Online Learning in the audit profession from the perspective of Big4 Companies and other players. *Advantages and disadvantages* of methods of Online Learning have been characterized, including the identification of areas where the use of Online Learning is considered not appropriate. To capture the "contents dimension", we have identified important elements of *mandatory programs* that include an Online Learning component. Furthermore, we have generally described the process that leads to the determination of contents for mandatory or voluntary Online Learning Initiatives. The approach has proved to be quite similar for all participating companies. Finally, we highlighted a pending practical problem for the evaluation of Online Learning in Germany.

Jegyzet

¹ The Theoretical background is Takeuchi – Nonaka (2004) and Takeuchi – Nonaka (2004). It should be noted that the relativism endorsed by the authors mentioned poses challenges when researching audit companies. Cf. Kühnel (2004) for details. A special focus on Professional Service Firms has been adopted in Kühnel (2002) and Farkas – Kühnel (2016).

² For an overview of typical steps in an audit from a knowledge perspective cf. Abdolmohammadi – Usoff (2001).

³ For a discussion of the basic terminology cf. Moore et al. (2011).

⁴ An example related to a Big4 company is discussed in Kühnel (2004).

⁵ Abschlussprüferaufsichtsstelle (APAS), which is part of the Federal Office for Economic Affairs and Export Control (BMWi).

⁶ Wirtschaftsprüferkammer (WPK). The superior authority to this body is the Federal Office for Economic Affairs and Export Control (BMWi).

⁷ Cf. IFAC's International Education Standards.

⁸ An alternative description is Initial Professional Development.

⁹ This relates to skills required to perform audit tasks. Cf. Kühnel (2002).

¹⁰ Cf. Bürg – Mandl (2005, p. 76).

¹¹ This wording puts the emphasis on the asynchronous method of communication.

¹² Cf. Carenys – Moya (2016) on digital game-based learning.

¹³ Cf. Buckless – Krawczyk – Showalter (2014) for the simulation of audit procedures.

¹⁴ See later for a short discussion of the reasons.

¹⁵ Cf. Kühnel (2004) for an example of a professional project that has been put into practice.

¹⁶ Cf. Sonntag – Schaper (2016, p. 372.) for workplace-related knowledge acquisition and Hochholder/Sonntag (2016) for knowledge transfer.

¹⁷ Cf. Schnell – Hill – Esser (2018, p. 201, p. 208.); Leedy – Omrod (2016, p. 29., p. 217.).

¹⁸ Cf. Döring – Bortz (2016, p. 184.) on the benefits and use of open questions.

¹⁹ Cf. Schnell – Hill – Esser (2018, p. 315-339.).

²⁰ Cf. Meuser – Nagel (2009) on expert interviews.

²¹ Typically, local GAAP and IAS/IFRS.

²² Typically, local GAAP and IAS/IFRS.

²³ Especially, Handelsgesetzbuch (HGB) and related laws.

²⁴ Cf. ISQC 1.35-44.

²⁵ Cf. Castle – McGuire (2010).

²⁶ There is another benefit: Leaners need not meet in one physical place, which might save costs. Cf. Moskaliuk et al. (2016, p. 163.).

²⁷ Audit methodology describes a system of steps that are to be performed during an audit in order to formulate a well-founded opinion on the financial statements of the client (and probably other material submitted).

²⁸ Cf. IAASB's website on professional scepticism, available at <http://www.iaasb.org/projects/professional-skepticism> (retrieved March, 4, 2018).

²⁹ Quoted from IAASB (2017b, p. 4.): „Education and training can raise awareness and develop the needed attitude. At both the firm and engagement level, it is critical to reinforce and monitor the application of professional skepticism, including through setting the right tone at the top.”

³⁰ The information is captured on different hierarchical levels.

³¹ This type of input is obtained from specific organizational forms that focus on selected industries, technologies etc. I.e., it is obtained from "outside" of the formal learning organization.

³² §5 V Berufssatzung für Wirtschaftsprüfer/vereidigte Buchprüfer.

³³ Cf. Sonntag – Stegmaier – Schaper (2016, p. 256-258.)

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HR ANALYTICS AND ITS MODERATING FACTORS

This theoretical paper elaborates the moderating factors of Human Resource Analytics (HR Analytics), which is seen as one of the top initiatives in HR today. It seems that analytics is taking the guesswork out of the decision-making process by offering a more data-driven approach. Although HR Analytics holds a high priority for most organizations, the implementing process is slow and only a minor proportion of organizations even report applying it. HR Analytics is not making progress as it is proposed by many academics in the last 10 years. Therefore, it seems to be necessary to identify the moderating factors of HR Analytics that promote or prevent its success. The number of academic research articles dealing with this topic is very low. The impact of moderating factors on the level of HR Analytics is vague and remains unexplored. This paper offers potential explanations for the relationship between the moderating factors and HR Analytics and provides suggestions for organizations on how to best address these factors. Within the first section of this paper the development and theoretical assumptions of a more data-driven approach to decision-making in HR is elaborated. Next, the concept of HR Analytics is going to be defined. The third section illustrates case studies and takes a look on how widespread the practice of HR Analytics in organizations already is. In the following each moderating factor is going to be examined in detail. Finally, the major findings of the topic under review are discussed and summarized.

Keywords: HR Analytics, People Analytics, HR Metrics, Big Data, Strategic HRM

It seems that analytics is taking guesswork out of the decision-making process in the HR function. While most hiring, promotion and reward decisions are based on intuition, HR Analytics offers a more data-driven approach to making those decisions. The notion of measuring data in the HR function is not new. The pioneer Jac Fitz-enz already published a book on *How to Measure Human Resources Management* in 1984, emphasizing the need for measurements in the HR function. However, it took more than 30 years until the idea of applying big data in HR became an area of high interest. With his article in 2010 *Competing on Talent Analytics*, Thomas Davenport introduced an era with a lot of articles and papers heralding the start of applying big data in HR and describing how it would revolutionize the HR landscape. At that time, Dave Ulrich argued in his paper *Are We There Yet? What's Next for HR*, that the status of HR is more related to administrative and compliance duties. Nowadays, HR Analytics holds a high priority for the companies surveyed in a study by *Deloitte (2015)*. However, progress is slow and according to another study only about 16 percent of organizations even report applying HR Analytics (*CedarCrestone's 17th Annual HR Systems*).

The purpose of this paper is to address the question why HR Analytics is not making progress as it is proposed by many academics. In doing so, this paper provides a review of high quality research, related to moderating factors that promote or prevent the success of HR Analytics. However, high quality research in regards to the value of HR Analytics is quite rare. On the one hand, most of the articles are published by consultants with a business interest and more based on believe than evidence. On the other hand, most of the reported HR Analytics success stories have a narrow focus and deal with topics like turn-

over. The purpose of this paper is not only to identify and describe moderating factors of HR Analytics. It further aims to provide a better understanding on how moderating factors influence the level of HR Analytics and to show how organizations best address these factors.

Methodology

The literature review is based on the inclusion of research journal papers, books, white papers and consulting reports, dealing with the concept of HR Analytics and specifically with factors that seem to have an impact on the successful use of HR Analytics in organizations. The review was conducted using academic databases accessed through EBSCOhost and Google Scholar using the keywords *HR Analytics, Human Resource Analytics, People Analytics, Talent Analytics, and Workforce Analytics*. A total of 39 articles were added to the literature review, which were – with two exceptions – all published between the years 2004-2017. It is notable, that 33 out of the 39 articles were published from 2010 on, along with the publicity of Google's HR Analytics project *Oxygen* and the publication of the article *Competing on Talent Analytics* by Thomas Davenport. Although 22 of the 39 referenced articles were published in management research journals, the research revealed that there are many more consulting reports, white papers and blogs dealing with the concept HR Analytics. Hence, the topic under review does not seem to be of great importance for the management researchers. This results in a predominance of non-empirical articles. The majority of the referenced articles in this literature review are of non-quantitative empirical nature, only four articles involve testing of theoretically derived hypotheses.

The analysis of the articles revealed five main directions of moderating factors in regards to HR Analytics. For better transparency, they have been given the following names in this literature review: (1) identify problems, (2) data infrastructure, (3) information technology, (4) analytical skills, (5) enterprise approach. In order to ensure a better understanding of the topic under review, the literature review also covers the background of HR Analytics and elaborates the development and theoretical assumptions of a more data-driven approach to decision-making in HR. This is followed by an elaboration of existing definitions of HR Analytics. Further, case studies are illustrated in order to show how widespread the practice of HR Analytics in organizations already is. Finally, the major findings of the topic under review are discussed and summarized. *Table 1.* summarizes the details of the most important articles referenced in the literature review in regards to the topics covered.

Background of HR Analytics

The term human resource management (HRM) comprises the traditional core activities such as resource staffing, planning, performance appraisal, training and devel-

opment, compensation, labor relations, and safety and health. Besides these activities, HRM includes aligning these HR activities, managing organizational change and culture, and organizational design activities as part of its strategic role (*Schuler – Jackson, 2005*). The role of HRM evolved greatly since the 1980s and has changed from the role of an administrator of mandatory HR practices to a more strategic role by acting as a strategic business partner (*Ulrich – Dulebohn, 2015*). The evolution of HRM has mainly been affected by the development of new technologies, which have changed the different HR processes and the way the work is managed and done in organizations (*Stone et al., 2015*). This overall development of HRM has had a significant impact on the practice and the overall focus of HRM. When looking back in the administrative role of HRM, its main objective was to make HR practices more cost-effective. However, since HRM takes over a strategic role the objective is more related to generating value for the overall organizational business, for instance by improving customer satisfaction through enhanced employee engagement (*Ulrich – Dulebohn, 2015*).

The term strategic human resource management signals the belief that effective HRM has a positive impact on business effectiveness (*Jackson et al., 2014*). The stra-

Table 1.

Details of most relevant articles

| Authors | Background of HR Analytics | Definition of HR Analytics | HR Analytics in practice | Moderating factors of HR Analytics |
|-----------------------------|---|---|--|---|
| Marler and Boudreau (2017) | HR Analytics is relatively new and at the early adopters stage. The notion of HR Analytics appeared with the introduction of talent management applications | Practice enabled by IT that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and enable data-driven decision-making | | Analytical skills of HR professionals Management buy-in HR information technology |
| Pape, T. (2016) | Data-driven approach to HRM to improve decision-making process | HR Analytics as a decision process based on data analyses | | Data collection |
| Ulrich and Dulebohn (2015) | Development of HR from an administrative to a strategic role | | | HR should be connected to the broader organizational business context |
| Rasmussen and Ulrich (2015) | Data-driven approach to HRM to improve decision-making process | HR Analytics is a fad | | Business understanding of HR managers |
| Levenson, A. (2013) | Wider perspective of HR as the basis for the decision-making process and to create strategic value | | | Data collection Effective use of data Strategic data analysis |
| Aral et al. (2012) | | Measuring and monitoring individual performance | Positive correlation between financial performance and use of HR Analytics | HR information technology |
| Bassi, L. (2011) | The development of HR metrics and information technology has created new possibilities for business intelligence on the people side | Evidence-based approach for making better decisions on the people side of the business; it consists of an array of tools and technologies, ranging from simple reporting of HR metrics all the way up to predictive modelling | | Data availability Analytical skills of HR professional |
| Coco et al. (2011) | | | Positive correlation between HR Analytics and employee engagement, HR processes and business performance | Management buy-in |
| Levenson, A. (2011) | | HR Analytics as a way to improve the decision-making process | Positive correlation between financial performance and use of HR Analytics | Analytical skills of HR professionals Management buy-in |
| Mondore et al. (2011) | | Demonstrating that people have a direct impact on the business performance | Positive correlation between financial performance and use of HR Analytics | Analytical skills of HR professionals |
| Lawler et al. (2004) | Data processing, measuring and analyzing as the basis for decision-making process in HRM | Represents statistical and experimental techniques that are used to demonstrate the effect of HR activities on the performance of a company | | Analytical skills of HR professionals HR information technology |

Source: own construction

tegic role of HRM is based on the assumption that it links HRM to the organizational business environment and thus helps organizations to achieve objectives related to the strategic business and profitability (Schuler, 2013; Walsh et al., 2010). The development of strategic HRM is closely connected to the broader concept of strategic management, which has been affected by the global trend that business decisions should consider the external environment (Jackson et al., 2014). In line with this reasoning, Ulrich and Dulebohn (2015) propose that HRM should not only be linked to the narrow organizational business, but also be connected to various stakeholders and the broader business context of the organization. Hence, in addition to the employees, HRM needs to understand the customer behavior and business processes. This broader perspective constitutes the basis for the decision-making process and enables the HR function to create greater value by aligning its objectives and activities to the environment the organization is operating in (Levenson, 2013).

The major evolution HRM has made over time, along with the technological development, greatly impacts the measurement and decision-making processes of HRM. Similarly, many scholars argue that data processing, measuring and analyzing as the basis for decision-making process in HRM constitute the key factors in the development of HRM to a strategic partner (Lawler et al., 2004; Walsh, 2010). However, although this development is well-recognized, uncertainty is associated with the business impact of HRM, as a gap of respective research results is still existing in the literature (Boudreau – Ramstad, 2007; Walsh, 2010; Jackson et al., 2014). Indeed, compared to other functions like finance and marketing, HR is lacking proper analytical tools and metrics for the decision-making process and is thus left behind in producing strategic value (Lawler et al., 2004). A data-driven approach to HRM is perceived as a possible way to address this problem, enabling decisions based on evidence instead of intuition or personal experience (Lawler et al., 2004; Rasmussen – Ulrich, 2015; Pape, 2016). However, when examining the literature more closely it has to be noted that concepts surrounding the notion of evidence-based decision-making in HRM are still not fully established.

The idea of measuring data in HR is not new and developed almost simultaneously with the changing role of HRM. Metrics on measuring cost, quantity and time of workforce already emerged in the 1970s. In the 1980s, these metrics began to include benchmarking, which allowed organizations to compare their results with other organizations (Fitz-enz, 2010). Later on in the 1990s balanced scorecards and strategy maps were developed to include operational targets and strategic goals of the organizations. Typically, the HR balanced scorecards included HR outcomes and processes, alignment between the processes and the business strategy, and KPIs measuring the effectiveness of the HR outcomes and processes (Douthitt – Mondore, 2014). HR metrics are usually divided into four types, including effectiveness metrics, efficiency metrics, and impact or outcome metrics (Lawler et al., 2004; Boudreau – Ramstad, 2007). Boudreau and

Ramstad (2007) claim that HRM has mainly been engaged in measuring the efficiency of the HR function itself, instead of providing measurements indicating the value it generates for the overall business. Although the focus is still strongly on HRM itself, measurements have already shifted from activities towards the outcomes, along with the development of strategic HRM. In order to deliver more strategic value, HR will need to be able to show correlations between its activities and business outcomes (Ulrich – Dulebohn, 2015).

Definition of HR Analytics

The process of applying big data in HR has been given different names, including HR Analytics, People Analytics, Talent Analytics, and Workforce Analytics. Just as with the name, no uniform definition of HR Analytics exists (Marler – Boudreau, 2017). A first definition approach distinguishes HR Analytics from HR metrics and states that it represents statistical and experimental techniques that are used to demonstrate the effect of HR activities on the performance of a company (Lawler et al., 2004). Later on, the definitions of HR Analytics become more generally and describe it as a process that either focuses on analysis or on decision-making. According to Harris et al. (2011), HR Analytics consists of six different types of analytical processes for analyzing HR data. Falletta (2014) defines HR Analytics in terms of 18 HR practices. Her research shows that employee surveys are predominant, followed by talent profiling and HR metrics. Mondore et al. (2011) take a more strategic approach and define HR Analytics as demonstrating that people have a direct impact on the business performance.

Bassi (2011, p. 16.) probably reports the most comprehensive definition until the middle of this decade by stating that HR Analytics ‘is an evidence-based approach for making better decisions on the people side of the business; it consists of an array of tools and technologies, ranging from simple reporting of HR metrics all the way up to predictive modelling’. This definition considers that HR Analytics includes the idea of reporting important HR metrics, generating more ambitious solution concepts supported by predictive modelling and adopting an evidence-based approach to the decision-making process. Marler and Boudreau (2017, p. 15.) go one step further by defining HR Analytics as ‘a HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and enable data-driven decision-making’. This definition emphasizes the strategic role of HR Analytics as it goes beyond reporting HR metrics and connects HR decisions and processes with organizational performance. These HR decisions and processes are not only based on sophisticated analysis of HR data, but involve data from different internal functions and even external data. The analysis of the data requires respective information technology and employees with the necessary skills.

The discussion of the definition characterizes HR Analytics as an innovation in the subject area of human resource management (HRM). Hence, it is too early to estimate whether it becomes an established institutional HRM practice or disappears when its expectations are not realized (*Marler – Boudreau, 2017*). The future development of HR Analytics may, to some extent, depend on moderating factors that promote or prevent the success of it. Some of them were already raised in the discussion of the characteristics of it. For instance, an innovation that links HR decisions with organizational performance requires the involvement of the top management of the organization. As HR Analytics collects and analyses not only HR data but also data from other internal functions and data external to the organization, a whole enterprise approach is needed. A sophisticated analysis of the data requires respective technology that is applied by employees with the right skills. Finally, the information analyzed itself has to be comprehensive and of good quality.

HR Analytics in Practice

Aral et al. (2012) present strong evidence for a positive correlation between financial performance and the use of HR Analytics in their empirical study. In addition, several non-empirical articles confirm this correlation with illustrative case studies (*Harris et al., 2011; Coco et al., 2011; Mondore et al., 2011; Levenson, 2011; DiBernardino, 2011*). For instance, *Harris et al. (2011)* describe how Sysco performs HR Analytics to determine connections between higher revenue, delivery driver employee satisfaction, work climate surveys and customer loyalty. Further, they illustrate how Google uses their applicant database to predict the individual level of performance. By providing a detailed case study, *Coco et al. (2011)* show how Lowes, a home improvement retail chain, performs HR Analytics in order to establish a link between employee engagement, HR processes and store performance. Through higher employee engagement they were able to increase the average customer ticket sales per store by 4 percent.

Given this evidence, which supports the assumed positive link between HR Analytics and business performance, it is surprising that there is still a low level of HR Analytics across the companies. In line with that reasoning, *Falletta (2014)* surveyed 220 Fortune 1000 firms to determine the use of HR Analytics. She discovered that for only 15 percent of the sample HR Analytics played a key role in defining or introducing the HR strategy. Beyond that, the primarily HR Analytics activity was analyzing results of employee questionnaires. *Lawler and Boudreau (2015)* report in a similar study, which surveyed more than 100 Fortune 500 firms, that less than 30 percent of the firms have HR Analytics that determines the correlation between HR processes, employees and business impact. However, more than 70 percent of the firms use HR metrics to show how efficient their HR processes are. This allocation of HR resources is questionable when considering that administrative costs typically only represent 3 percent of a company's selling. Thus, reducing HR

administrative expenses is unlikely to have any impact on business performance (*Harris et al., 2011*).

Moderating Factors

Identify problems

The mathematician *John W. Tukey (1962, p. 13.)* stressed that 'an approximate answer to the right question, which is often vague, [is far better] than an exact answer to the wrong question, which can always be made precise'. This notion is relevant in a way that it helps HR Analytics to become the desired innovation as expected by many academics and practitioners, and to avoid just being another management fad. *Rasmussen and Ulrich (2015)* argue that an extensive analysis of a large amount of data and trying to answer the wrong questions will have little practical value. In order to deliver value to the organization, the ability is needed to go beyond just identifying patterns and to initiate and execute the entire organizational change process. This requires HR managers to have a clear business understanding and focus, who are at the moment in short supply (*Rasmussen – Ulrich, 2015*).

Fink (2017) suggests that an end-to-end HR Analytics work flow starts with asking the right question and ends with measuring the result to determine whether the action was effective. However, the *Chartered Institute for Personnel and Development (2013)* argues that HR professionals do not have enough knowledge, skills and business insight to ask the right question based on the data that is available to them. Moreover, even if HR professionals do have good and promising approaches related to analytics, their hierarchical position within the organization may hinder their initiatives from being realized (*Smeyers, 2015*).

Data infrastructure

Harris et al. (2011) stress the importance of having consistent, accurate, integrated, relevant and accessible employee data available in order to track employee competencies and reveal patterns. *Bersin (2013)* points out that the availability of HR data is not an issue since organizations have captured educational history, demographic and performance information, and many other employee factors since around three decades. However, the full potential of HR Analytics can only be exploited when data across functions and even external to the organization are combined. Likewise, *Rasmussen and Ulrich (2015)* emphasize that HR Analytics is more likely to reveal new insights when different perspectives and fields (e.g. customers, investors, technology, human capital, etc.) are combined. Hence, any limitation in regards to data and information restricts the potential of HR Analytics.

In contrast to the statement by Bersin, data availability is an issue. On the one hand researchers report that data are not fully collected or inaccurate (*Bassi, 2011; Angrave et al., 2016; Pape, 2016*) On the other hand, the required data is not fully accessible as it is not integrated across functions, divisions or geographies (*Douthitt – Mondore, 2014*). As a result, generated reports and conducted anal-

yses are very basic and only reflect insufficient efficiency-based metrics (Falletta, 2014). According to Angrave et al. (2016), this situation might change when information technology vendors see HR Analytics as a new innovation to increase their profits. Then, human resource information systems (HRIS) would improve in regards to functionality and ability to integrate data from different sources.

Information technology

The importance of HRIS for HR Analytics is noted by several articles. Indeed, Aral et al. (2012) demonstrated in their study that organizations with HR Analytics, but without HRIS show no performance improvement. In relation to HR Analytics, information technology can be both an enabler and an obstacle. Good HRIS act as an enabler for HR Analytics, when they capture and store data, and make accessible data across functions, divisions or geography to generate reports, scorecards and dashboards (Marler – Boudreau, 2017). However, as mentioned previously, current HRIS capabilities do not meet the requirements of HR Analytics.

The latest development in HRIS is the talent development suite, which is an integration of different HR processes, including recruitment, performance management, learning and development, and compensation management. According to Bersin (2014), a global market of 6 billion US-Dollars was estimated for this kind of product. The key players dominating this market are Oracle, IBM, SAP and Workday. By making it easier to access, operate and understand the relevant HR data, the primary purpose of their type of HRIS is to improve HR processes (Angrave et al., 2016). Hence, they can be used as a basis for HR Analytics as they capture, store and report HR-relevant data and metrics. However, anything that goes beyond in the direction of advanced analytics requires information technology that focuses on data exploration, analysis and modeling.

According to a study by Kaur and Fink (2017), the most used technologies for HR Analytics include R, Tableau, Python, SPSS and Excel. The study confirms that HRIS are not sufficient enough to conduct statistical analysis and data visualization. The most frequent tool used is R, which is favored because of its compatibility with many file formats and other tools like Tableau, and also offers several machine learning packages. The used technology already implicates that HR Analytics requires advanced statistical and econometric skills that exceed the correlation analysis of dependent and independent variables.

Analytical skills

The lack of HR professionals with analytical skills is probably the most common reason cited in the literature why HR Analytics does not become more widespread. However, even analytical people need statistical or econometric software like R or Stata. The analytics packages that can be added to the standard HRIS do not have the power and flexibility to test through analysis of experiments that assumptions about correlations between specific variables derive from certain causalities (Cascio

– Boudreau, 2011). Bassi (2011) proposes, that the HR function will lose responsibility in regards to analytics to the IT and Finance function, if it does not have the skills to use analytic information technology tools and to obtain and use measures of business results. Angrave et al. (2016) elaborate this concern and stress, that the human capital input into the business will be fundamentally misunderstood, if the HR function is not fully participating in the modelling process.

In order to effectively perform HR Analytics HR professionals need specific analytical competencies. These include data preparation, research design, root cause analysis, quantitative data collection, data analyses, and multivariate models (Levenson, 2011). This is a complex process, which needs to be translated into an understandable result so that the top management can base their decisions upon it (Angrave et al., 2016). Levenson et al. (2005) report in their study that a high level of statistical skills is not in high demand in the HR function. However, there is even an insufficient supply at this low level. HR Analytics professionals with advanced statistics skills only represent one third of their profession. This proportion drops to three percent when only considering HR professionals not hired for HR Analytics.

The opinion on the question whether academics can support to close the gap between HR professionals and data scientists of an already existing business analytics projects is divided. The involvement of academics in corporate analytics projects has been reported in many articles (Sparrow et al., 2015; Cascio – Boudreau, 2011). There is evidence of organizations drawing on the expertise of PhDs in occupations like engineering, statistics and psychology to enhance their analytics activities (Bersin, 2015). In contrast, Rasmussen and Ulrich (2015) question their business understanding to ask the right question. They even go one step further and suggest taking HR Analytics out of HR in order to become part of cross-functional end-to-end business analytics.

Enterprise approach

The next moderating factor of HR Analytics is culturally and politically based. The successful implementation and performance of HR Analytics is characterized by changes and will thus demand high flexibility and adaptability from the whole organization. In this regards, Rasmussen and Ulrich (2015) highlight Festinger's findings on cognitive dissonance. According to Festinger, there is a strong bias towards rejecting information that pose a risk to existing convictions, especially if they have invested effort, time and identity in their ideas or projects. Therefore, HR Analytics success depends on overcoming such resistance by involving key stakeholders in the process ahead of conducting the analysis. HR Analytics is not just about data and science but also about activism and change management (Rasmussen – Ulrich, 2015).

Davenport and Harris (2007) call for a culture that is open to analytics and with an organization-wide acknowledgement of measuring, testing and evaluating quantitative data. This would in turn urge employees to take

decisions in a highly rational way. The analytical approach should be included in the company strategy and be pushed down to every company level. That is why the success of HR Analytics is in large part depending on the top- and middle management of an organization. *Waber (2015)* stresses, that 'you do need buy-in from leadership' (p. 3) when implementing HR Analytics. A culture is needed and has to be promoted by the leadership that tolerates experimentation and errors, which currently does not seem to be tolerated, especially in the HR function (*Davenport et al., 2010*).

A whole enterprise approach is required with the integration of processes, data and analysis throughout the company (*Harris et al., 2011*). As HR Analytics requires gaining access to cross functional data, managers from other functions must be involved in the process and willing to provide access to the data. *Davenport and Harris (2007)* suggest that all data-collection and actions in this regards should be under the control of one common management. Such a project needs to be managed by people with the skills to manage changes in processes, behaviors and culture triggered by analytic initiatives (*Harris et al., 2011*). That is why HR professionals must build credibility among the top management who may not believe in data-driven results by the HR function.

Discussion and Conclusions

The elaboration of the moderating factors of HR Analytics provide some possible explanations on why HR Analytics is not making progress as it is proposed in the literature. Overall five main moderating factors have been identified in the literature that promote or prevent the success of HR Analytics. Most of the articles are theoretically based and provide limited scientific evidence concerning the practical implementation and application of HR Analytics. Current research is dominated by qualitative case studies drawing on already existing management frameworks at a very broad general level. That is why even leading researchers do not agree on HR Analytics to be the next 'must have' innovation in the HR function. Hence, there is still much room for academic researchers to contribute to the development of the concept HR Analytics, especially through scholarly scientific research.

The development during the past four decades shows that the HR function takes over a more strategic role. Along with advanced information technology, this development is mainly based on more sophisticated HR measurements and metrics that improve the decision-making process. However, practitioners will have to overcome certain obstacles on which a successful implementation of HR Analytics is depending on. Among the main obstacles are HR professionals who do not understand analytics or big data and analytics specialists who do not understand HR. Consequently, even the latest costly forms of HRIS, which provide analytics capabilities, are failing to contribute to the achievement of strategic HR Analytics objectives. A different and more comprehensive approach is needed to avoid HR Analytics just being a management

fad. In this regards, the five moderating factors identified in the literature appear to play a significant role and to have an impact on the success of HR Analytics.

First, HR professionals need to be able to identify organizational problems and to ask the right questions. Analyzing a large amount of data trying to answer the wrong question will most likely damage the interests of employees instead of being beneficial. Second, HR Analytics requires an infrastructure that makes accurate and consistent data across functions and even external to the organization accessible. Third, information technology is needed that goes in the direction of advanced analytics and focuses on data exploration, analysis and modeling. Most of the current HRIS capabilities do not meet these requirements and need to be upgraded. Next, in order to effectively perform HR Analytics HR professionals need specific skills to prepare the data, conduct statistical analysis and communicate the results in a meaningful and understandable way. In this regards, the deployment of academics can support to close the gap between HR professionals and data scientists of an already existing business analytics projects. Indeed, some organizations are already drawing on the expertise of PhDs in occupations like engineering, statistics and psychology to enhance their analytics activities. Finally, in order to implement HR Analytics effectively, a whole enterprise approach is needed with the integration of processes, data and analysis throughout the organization. This demands high flexibility and adaptability from the whole organization, which has to be managed in a change management process.

In conclusion, despite being a new area of high interest, which is discussed by many academics and industry professionals, only a small amount of scientific research exists. The reason might be the innovative nature of HR Analytics, which is lacking a scientific research approach. The development of an integrated, strategic framework on how to implement and operate HR Analytics would reduce the uncertainty early-adopters are facing at this early stage. This review helps to better understand the relationship between important contextual factors and the successful adoption of HR Analytics. However, further research is needed to better evaluate the impact of these factors.

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A CIKKEK MAGYAR NYELVŰ ÖSSZEFOGLALÓI

Hubert József

Corporate Self-Disclosure in Social Media (Vállalati önfeltárás a közösségi médiában)

Az önfeltárás jól ismert és sokat kutatott terület a személyközi kapcsolatok vizsgálatában. A fogalmat a korábbi kutatások részben kiterjesztették a vállalatok és fogyasztók kapcsolatára is, noha nem teljesen azonos jelentés tartalommal. Jelen értekezés a meglévő fogalmakra valamint önálló kvalitatív eszközökkel történő kutatás eredményeire támaszkodva egy új definíció megalkotására tesz kísérletet, a vállalat és fogyasztó közötti kommunikációban. A kutatás eredményei abba az irányba mutatnak, hogy a közösségi média a vállalati önfeltárás számára is alkalmas terep lehet.

Kun, András István – Ujhelyi, Mária

Cultural Fit and Academic Performance of Higher Education Students (Felsőoktatási hallgatók kulturális illeszkedése és tanulmányi teljesítménye)

Tanulmányunk egy ritkán vizsgált területen nyújt bizonyítékot a kulturális illeszkedés és az egyéni teljesítmény kapcsolatára: a felsőoktatási hallgatók tanulmányi teljesítményére vonatkozóan. Az egyéni kulturális illeszkedést az Organizational Culture Assessment Instrument (OCAI) egy adaptált változatával mértük (annál jobbnak tekintve az illeszkedést, minél közelebb volt a kívánatos és az aktuális észlelt kultúra), a hallgatók teljesítményét pedig a féléves tanulmányi átlagukkal. A mintánkat a (névtelenség miatt törölve) 348 nappali tagozatos hallgató alkotta. Lineáris és rangkorreláció, illetve lineáris regresszió-elemzéssel kapott eredményeink alátámasztották, hogy a hallgatók kulturális illeszkedése intézményükhöz pozitív kapcsolatban áll tanulmányi eredményükkel.

Varga, Dávid

Triple-Bottom-Line Impact Analysis Framework of Fintech Companies (A hármas optimalizálás hatásának vizsgálati keretrendszere fintech cégek esetében)

A pénzügyi intézményeknek kulcsszerepük van a piaczgazdaságban. A bankok közvetítőként járnak el a megtakarítók és a hitelfelvevők között, csökkentik az információs aszimmetriát és lehetővé teszik a befektetést. Fontos szerepet játszanak a társadalomban, pénzügyi szolgáltatásokat kínálnak az embereknek és lehetővé teszik a vállalati befektetéseket.

A hagyományos bankok nem tudnak pénzügyileg hatékonyan bevonnani minden embert – különösen nem érik el a piramis alján lévő embereket. Az újonnan megjelenő pénzügyi technológiai vállalatok – a fintechek – már kezdték feltölteni a szakadékat, szolgáltatásokat biztosítva a piramis alján lévő embereknek, az információs és kommunikációs technológiák (IKT) és az új üzleti modellek alkalmazásával. A fintech cégek hármas optimalizálás (TBL) hatáselemzése új, feltörekvő kutatási terület. Ez a cikk kitölti a jelenlegi irodalomban rejlő szakadékat oly módon, hogy javaslatot tesz egy analitikus keretrendszerre, amely a fintecheket a TBL értéktérítő szempontjából értékeli. A cikk bemutatja a Fintech TBL Impact Analysis Framework előnyeit több mint száz jelenleg működő fintech és meglévő fenntartható banki kezdeményezés eredményei alapján. A keretrendszer tartalmazza a fintech cégek direkt és indirekt TBL értéktérítő elemeit, amelyeket az ő gazdasági, társadalmi és környezeti hatásai mentén szerveztek, egyszerű, de mégis hatékony értékelő eszköz a fintech cégek TBL hatásainak elemzésére, segíti a TBL-lel kapcsolatos kiigazítások készítését, növeli a jelenleg felkínált megoldásokat, vagy segíti TBL értéktérítő elemeket tartalmazó új pénzügyi termékek tervezését.

Kovács, Eszter – Martos, Tamás

Patterns of optimism and employee well-being – a person-oriented approach to explanatory style in Hungarian employees (Minták az optimizmusra és az alkalmazottak jóllétére – a magyarázó stílus személyközpontú megközelítése magyar alkalmazottak esetében)

Az egyéni és szervezeti teljesítmény kulcsstényezői között egyre inkább elismerik a munkavállalók jóllétének szerepét. Ennek fontos összetevője az optimista beállítódás, amit a pozitív és negatív események okaival kapcsolatos magyarázatok stílusával hoznak összefüggésbe. Jelen tanulmányunkban magyar munkavállalók mintáján vizsgáljuk az optimista magyarázó stílus különböző típusait és ezek összefüggését a jólléttel. Ennek során egy nemrég kifejlesztett eljárás, az MQ Teszt (Kovács – Martos, 2017) eredményeire támaszkodtunk mely az optimizmust pozitív és negatív helyzetekre adott reakciók révén méri. A keresztmetszeti adatfelvételt alkalmazó kutatásban 992 magyar munkavállaló válaszait elemeztük személyorientált megközelítéssel (Bergman – Lundh, 2015). A klaszterelemzés a pozitív és negatív helyzetekre adott magyarázatok 5 típusát tárta fel, melyeket „Győztes”, „Harcos”, „Szerencsés”, „Túlélő” és „Csodaváró” klasztereknek

neveztünk el. A klaszterek és a jóllét (énhatékonyság, önértékelés és élettél való elégedettség) mutatói közötti kapcsolatok elemzése azt mutatta, hogy az egyes klaszterekbe tartozó válaszadók jelentősen különböznek egymástól ezeken a dimenziókon. Az eredményeket abból a szempontból értelmeztük, hogy az egyes stratégiákkal jellemezhető munkavállalói csoportoknak milyen erősségeik és gyengeségeik lehetnek a szervezeti működés során, illetve hogy ezekben a csoportokban milyen lehetőségei vannak a magyarázó stílus tréningyszerű fejlesztésének.

Duma, László – Nagy, Vitéz

Curve-Based E-Learning Efficiency Grading (Görbealapú e-learning hatékonyságmérés)

A cikk javaslatot tesz az e-learning lehetőségeit kiaknázó az oktatás hatékonyságát értékelő mérési módszerre. A hagyományos oktatási rendszerek értékelési korlátainak áttekintése, majd az e-learning specifikumok azonosítása után, azok figyelembevételével a szerzők javaslatot tesznek az oktatási folyamat egyes paramétereinek (és nem a tanulók eredményeinek) eloszlására épülő értékelési módszerre. A szerzők megfogalmazzák, hogy mit várnak el az oktatási hatékonyság mérésétől, majd konkrét értékelési kritériumokat és mutatószámokat is bemutatnak. Az új mérési módszer lényege, hogy az egyes e-learning kurzusok hatékonysága mérhető a normális eloszlás sajátosságaiival, illetve más kurzusok egyes paramétereinek eloszlásának összehasonlításával.

Stephan Kühnel

Use of Online Learning for Continuing Professional Education and Development by German Audit Companies (Online tanulás használata szakmai képzésekben és fejlesztésekben német audit cégeknél)

This paper presents results of an empirical research project on the status of Online Learning from the Perspective of German Audit Companies (Big4 and Next10). A tanulmány egy online tanulóval foglalkozó gyakorlati kutatási

projekt eredményeit mutatja be, amit német audit cégnél (Big 4 és Next 10) végeztek el. Az elméleti alapok összekapcsolják a tudásmenedzsment elemeit és a professzionális szolgáltató cégeket (cf. Kühnel, 2002; Farkas – Kühnel, 2016). Az eredmények a szerzők és a vállalatok képviselőinek interjúin alapulnak. A tanulmányból következtetéseket vonhatnak le a szakmai továbbképzési vagy fejlesztési kezdeményezések jövőbeli struktúrájáról.

Kristian Kremer

HR Analytics and Its Moderating Factors (HR analitika és annak moderáló tényezői)

Ez az elméleti tanulmány kidolgozza a humán erőforrás-elemzés (HR Analytics) moderált tényezőit, amelyek ma a HR egyik legfontosabb kezdeményezői. Úgy tűnik, hogy az analitika a becslést kiveszi a döntéshozatali folyamatból egy adott adatközpontú megközelítés segítségével. Bár a HR Analytics kiemelten kezelt a legtöbb szervezetben, a megvalósítási folyamat lassú, és a szervezetek csak kis része tesz jelentéseket, alkalmazva azt. A HR Analytics nem terjedt úgy el, ahogyan azt sok tudós az elmúlt 10 évben javasolta. Ezért szükséges azonosítani a HR Analytics moderáló tényezőit, amelyek elősegítik vagy biztosítják a sikerességet. Ezzel a témával foglalkozó tudományos kutatási cikkek száma nagyon alacsony. A moderáló tényezők hatása a HR Analytics szintjén homályos, és még nem kellően feltárt. Ez a tanulmány potenciális magyarázatot ad a moderáló tényezők és a HR Analytics közötti kapcsolatáról, és javaslatokat nyújt a szervezetek számára arról, hogy hogyan lehet ezeket a tényezőket legjobban kezelni. A tanulmány első részében a szerző bemutatja egy HR-döntéshozatalban alkalmazott, adatközpontú megközelítés fejlesztési és elméleti feltevéseit. Ezután meghatározza a HR Analytics koncepcióját. A harmadik részben esettanulmányok illusztrálják ezt, és a szerző megvizsgálja, milyen széles körben terjedt el a HR Analytics gyakorlata a szervezetekben. Ezt követően minden moderáló tényezőt részletesen megvizsgál. Végül a tárgyalt téma legfontosabb eredményeit vitatja meg és foglalja össze.

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A Szerkesztőség