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Working Paper

Love your mistakes! - They help you adapt to change: The new scale of learning culture

GUT FME Working Paper Series A, No. 8/2019 (60)

Provided in Cooperation with:
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Suggested Citation: Kucharska, Wioleta; Bedford, Denise A. D. (2019) : Love your mistakes! - They help you adapt to change: The new scale of learning culture, GUT FME Working Paper Series A, No. 8/2019 (60), Gdańsk University of Technology, Faculty of Management and Economics, Gdańsk

This Version is available at:
https://hdl.handle.net/10419/246277

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FACULTY OF MANAGEMENT AND ECONOMICS

LOVE YOUR MISTAKES! -THEY HELP YOU ADAPT TO CHANGE. THE NEW SCALE OF LEARNING CULTURE

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GUT Faculty of Management and Economics

Working Paper Series A (Economics, Management, Statistics)

No 8/2019 (60)

December 2019

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Love your mistakes!—They help you adapt to change. The new scale of learning culture

Abstract

Purpose: There is no learning without making mistakes. Collaboration, knowledge, and learning culture shape organizational behaviors. Hence, this study aims to develop a theoretical model of the above constructs to determine how mistakes are related to organizational intelligence based on the structural model, including the relations between the above constructs.
Methodology: New scales of the above constructs, including the learning culture scale, which is composed of the dimensions of "acceptance of mistakes" and "learning climate," were developed and validated based on two samples: students aged 18–24 and employees aged >24 who work in knowledge-driven organizations. Structural equation models were then developed, assessed, and compared.
Findings: Mediated by "acceptance by mistakes," the effect of the "learning climate" on "change adaptability" has been detected for young students aged 18-24 but this relation is not significant for business employees aged >24.
Limitations: Both samples were obtained from Poland, and "business sample" is in majority represented by small- and medium-sized companies. Hence, the business sample may reflect national culture. Big companies, more mature, usually design their own culture fitted to their business aims. Therefore, this study can be replicated for big Polish companies, international companies located in Poland and, for other countries.
Practical implications: Acceptance of mistakes is vital for learning culture development. Mistakes help employees adapt to change. Hence, a learning culture that excludes the acceptance of mistakes is somehow artificial and may be unproductive. Paradoxically, the fact that employee intelligence (change adaptability) is increasing via mistakes does not mean that organizational intelligence is increasing. It suggests that Polish knowledge organizations are not learning organizations.
Scientific implications: In this study, mistakes are presented as a precious resource that enables the adaptation and development of intelligence. Hence, this study opens a new area of research in the "management of organizational mistakes."
Novelty: This study breaks with the convention of "excellence" and promotes the acceptance of mistakes in organizations to develop organizational intelligence. This study is also the first to propose a constant learning culture scale that embodies the acceptance of mistakes and "learning climate." Further, it empirically proves the value of mistakes.

Keywords: organizational learning, change adaptability, constant learning culture, knowledge culture, collaborative culture

JEL: D83 M14 M14

Introduction

When we want to learn, we must be ready to be wrong (Senge, 2006), but paradoxically, the majority of learning organizations expect people to constantly learn without making mistakes. Most organizations have a low tolerance for mistakes. Hence, the question is: How can we learn fast and adapt to changes without making mistakes? Change is inevitable, and it occurs every day. Garvin et al. (2008) stressed that being a learning organization are open to making changes when needed. Therefore, it is important to understand the extent to which the acceptance of mistakes fosters adaptability to change. Thus, the aims of this study are to determine whether there is a low level of acceptance of mistakes and to assess the effect of learning on change adaptability via the acceptance of mistakes. Organizational culture appears to be an important factor in determining how employees learn via the acceptance of mistakes, bearing in mind that humans commonly make mistakes. Therefore, another important question is: How does company culture influence the learning process via mistakes?

Organizational culture is defined as a set of assumptions, beliefs, and values shared by the organization's members (Schein, 2010). Hartnell *et al.* (2011) and Schein and Schein (2017) found that organizational culture influences organizational effectiveness. Stojanovic-Aleksic et al. (2019) found that an organizational culture that supports knowledge has a positive effect on knowledge creation and sharing. They also noted that there are both similarities and differences in learning processes and knowledge creation. Learning is perceived as a wider concept that includes knowledge dynamics such as unlearning, re-learning, forgetting, solving conflicts, and problems. Knowledge creation is an intense process of human imagination, finding solutions, and learning from errors (Jakubik, 2008, cited in Senge and Scharmer, 2001, p. 247). Consequently, knowledge comes from learning, but the culture of knowledge lifts the learning culture.

Thus, an organizational culture that supports learning appears to be vital in the development of organizational intelligence. Gupta *et al.* (2000) suggested that organizational learning requires the desire for constant improvement to be shared by all members of the organization. Together, the norms of learning behaviors and shared values enhance organizational learning (Hedberg, 1981). Rebelo and Gomes (2009) defined learning culture as behaviors that are oriented toward the promotion and facilitation of workers' learning. The knowledge dissemination foster organizational development and performance. As a result, a constant learning culture via the acceptance of mistakes can make adaptability to change more effective.

There is no learning culture without a knowledge culture. Garvin (1993, p. 80) defined learning culture as "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights." Thus, a desire to possess knowledge is a motivation for learning. Islam *et al.* (2015) described the knowledge culture as the conditions that support the effective and efficient flow of knowledge throughout the organization. Collaborative culture is characterized by shared values and beliefs regarding an organization's open communication, encouragement of respect, teamwork, adaptability, risk-taking, and diversity (Pérez Lopez *et al.*, 2004; Barczak *et al.*, 2010). The

abovementioned cultures are undoubtedly tied to organizational intelligence. Thus, they are included in the current study to obtain a complete picture of the creation of change adaptability, which is a proxy for organizational intelligence (Feuerstein *et al.*, 1979).

A major focus of this study is the development and validation of the constant learning scale, including the "acceptance of mistakes," which enables the abovementioned relations to be measured. This type of measurement scale exists (e.g., Butler Institute for Families, 2014), but it omits the acceptance of mistakes factor, which is fundamental to this study. Similarly, other studies have also excluded the acceptance of mistakes when measuring the organizational learning culture (Yang, 2003; Marsick and Watkins, 2003; Yang *et al.*, 2004; Pérez Lopez *et al.*, 2004; Graham and Nafukho, 2007; Song, 2008; Dirani, 2009; Joo, 2010; Rebelo and Gomes, 2011b; Jiménez-Jiménez and Sanz-Valle, 2011; Islam *et al.*, 2013; Choi, 2019; Nam and Park, 2019; Lin *et al.*, 2019). The authors decided to fill this gap in the literature by proposing a scale of constant learning culture that empirically verifies the value of acceptance of mistakes. Mistakes are part of human learning, and the challenge caused by change is growing as fast as, or even faster than, human skills (Kotter, 2007, 2012). Thus, it is important to combine the abovementioned relations in one structure to learn more about the value of mistakes in relation to adaptation to change. The process of adapting to change is neither easy nor fast because people prefer assurance, repetitiveness, stability, and safety (Duhigg, 2012; Bocos *et al.*, 2015; Rafferty and Jimmieson, 2017). Thus, to obtain a complete picture of change adaptability that reflects "organizational intelligence" (Feuerstein, 1979), organizational culture and risk-taking factors have been included. This examination of the relations between the above constructs: knowledge, collaborative and learning culture will enable the authors to assess the extent to which the acceptance of mistakes fosters "organizational intelligence."

This study begins with a literature review and the development of the theoretical model. Next, the empirical model is performed and replicated based on two independent samples to ensure that the presented findings (and achieved reliabilities of new scales) are not the result of a coincidence. Table 1 outlines the framework of the whole study.

Table 1

Literature review and hypotheses development

To simplify Feuerstein's (1979) definition, intelligence is the ability to adapt to change. In today's aggressive and complex business conditions, organizations must continuously evolve and adapt to changes (Goswami, 2019). Thus, change adaptability and organizational intelligence are important, and they are linked with many other paradigms, including organizational learning and knowledge management (Yolles, 2005). An organization's power to manage knowledge and learning, and to exploit this knowledge to make decisions and adapt to changes in business, is vital (Soltani *et al.*, 2019). Culture is a "key ingredient in shifting from knowledge to intelligence" (Rothberg and Erickson, 2005, p. 283). Thus, the literature review begins by examining the influence of knowledge, collaboration, and the learning culture on change adaptability. To do this, an initial search was conducted of key

scientific databases (e.g., Emerald, Elsevier, Wiley, Taylor & Francis and Springer) using article keywords. Relevant articles were identified by verifying whether the study topic and context matched the present study's purpose. Based on this procedure, the selected literature were studied and applied to the current study's hypotheses formulation.

Knowledge culture

Humans learn to possess knowledge, but passive knowledge does not produce value. Knowledge in action (Rothberg and Erickson, 2005) requires strategic and tactical intelligence, which comes from the intellectual capital of the organization and its knowledge processes. A set of knowledge routines that is visible in the organizational pattern of behaviors is a knowledge culture. Culture is a "key ingredient in shifting from knowledge to intelligence" (Rothberg and Erickson, 2005, p. 283). The significant influence of a knowledge culture on knowledge sharing and learning was pointed out by Eid and Nuhu (2011) and Mueller (2014, 2018). Hence, knowledge culture is important, but it is insufficient for constant development. A knowledge culture is powerful, but a learning culture is fundamental for growth. Learning guarantees development, but a knowledge culture is required to enhance the positive attitude and motivation to learn routines. Hence, knowledge culture influences learning culture dimensions. Therefore, the hypotheses have been formulated as follows:

H1a: Knowledge culture influences the "learning climate."

H1b: Knowledge culture influences the "acceptance of mistakes."

Moreover, knowledge processes such as knowledge creation and sharing cannot proceed without collaboration (Nonaka and Toyama, 2003). Hence, the culture of knowledge must be a driver of collaboration routines at work. Therefore, a hypothesis has been proposed as follows:

H2: Knowledge culture influences the collaborative culture.

Collaborative culture

An appropriate climate for knowledge dissemination can be observed in a collaborative culture and is reflected in interactions and communications that foster employees' learning (Pinjani and Palvia, 2013; Arpaci and Baloglu, 2016). A collaborative culture is shaped by learning the organization's outlines, attitudes, and behaviors to foster competitive performances (López et al., 2004; Muneeb et al., 2019). A competitive advantage is created by intellectual capital (Bounfour, 2003; Sobakinova *et al.*, 2019). Relational capital supported by culture fosters the development of a competitive advantage and performance (Nazari *et al.*, 20011; Zardini *et al.*, 2015; Covino *et al.*, 2019; Chowdhury *et al.*, 2019). Most learning at work takes in the interactions; namely, employees learn faster when learning together – the one form the other (Poell and Van der Krogt, 2010). According to Julien-Chinn and Liets (2019), the decision-making process is supported through group dialog, and the ideas of collaboration and shared decision-making are congruent with a learning culture. Collaboration broadens the perception of things, helps understand things deeper by enabling a shift in the particular individual's mindset and fostering learning (Senge, 2006). Collaboration throughout

the organization enables learning and changes in behavior (Garvin *et al.*, 2008). Pérez López *et al.* (2004) and Nugroho (2018) stressed that organizational learning might be affected by a collaborative culture. Hence, a collaborative culture positively influences learning routines. Based on this, the following hypothesis has been developed:

H3a: Collaborative culture positively influences "learning climate."

Organizational learning has also been defined as the course of identifying and modifying mistakes resulting from interactions (Argyris and Schön, 1997). Hence, it is hypothesized that:

H3b: Collaborative culture positively influences "acceptance of mistakes."

Constant learning culture

A constant learning culture is important for continuous improvements and learning (Ahmed *et al.*, 1999; Conner and Clawson, 2004; Bates and Khasawneh, 2005). The organizational learning culture was mainly conceived to promote and support constant learning in organizations. Rebelo and Gomes (2011a, 174) noted that "learning as one of the organization's core values, a focus on people, concern for all stakeholders, stimulation of experimentation, encouraging an attitude of responsible risk, readiness to recognize errors and learn from them, and promotion of open and intense communication, as well as the promotion of cooperation, interdependence, and share of knowledge." Hence, an organizational constant learning culture is composed of a "learning climate" and "acceptance of mistakes." Therefore, the proposed new scale splits constant learning culture into "learning climate" and "acceptance of mistakes." People with a learning mindset are ready to be wrong (Senge, 2006)—that is, they accept that mistakes happen, and they learn from them. Zappa and Robins (2016) noted that the essence of organizational learning is identifying and modifying errors. Based on this, the following hypothesis has been developed:

H4: "Learning climate" fosters "acceptance of mistakes."

Watkins and Marsick (1993) noted that the first step in building a learning organization is to create the ability to learn and change. Rebelo and Gomes (2011a) highlighted that a learning culture must include the acceptance of mistakes to enable people to leave their comfort zone and solve problems by developing new approaches. A higher level of mistakes acceptance foster a learning process visible in the level of the adoption to inevitable change (Hind and Koenigsberger, 2008; Thomas and Brown, 2011). Hence, the following hypothesis has been developed:

H5: Acceptance of mistakes fosters adaptability to change.

Organizational learning and change are interconnected (Argyris, 1982; Watad, 2019). Learning fosters change, and change stimulates learning. Learning requires motivation (Heckhausen *et al.*, 2010), but change is inevitable. Organizational learning efficiently and effectively drives business challenges and provides resilient adaptation for rapid growth (Vithessonthi and Thoumrungroje, 2011). It provides a chance to learn and an opportunity to

deliver unique value to the organization—for example, via innovations (Ghasemzadeh *et al.*, 2019). Further, learning occurs when observed organizational behaviors change (Bahrami *et al.*, 2016). Learning enhances the efficiency of business opportunities - chances management (Li *et al.*, 2014). Dynamic and uncertain environments require a culture that is oriented toward constant, productive learning, which leads to innovative approaches (Rebelo and Gomes, 2011a). Therefore, a learning culture is essential to knowledge organizations survival and development (Scott-Ladd and Chan, 2004). A culture of learning is important for continuous improvement (van Breda-Verduijn and Heijboer, 2016). Change can be considered a phenomenon that is tied to continuous learning and further adaptation to change (Nadim and Singh, 2019). According to Yeo (2007), organizational learning cannot be said to exist unless a change is noted in the way how employees confront their daily problems and engage in defensive (against changes) routines. Organizations that continuously renew their knowledge are in a better position to adapt to changes in the business environment and respond to them more quickly (Sanz-Valle *et al.*, 2011). Hence, it is hypothesized that:

H6: "Learning climate" fosters adaptability to change.

Expected mediations

Logically, knowledge culture should drive change adaptability, which is a proxy of organizational intelligence, but a direct influence may not be easy to detect. Moreover, change adaptability requires a learning culture, which is not the same as a knowledge culture. Hence, some mediation in the relation between knowledge culture and change adaptability is expected. According to Nonaka and Toyama (2003), knowledge processes cannot proceed without collaboration. Therefore, it is assumed that collaborative culture mediates the relationship between knowledge culture and learning:

KC->CC->LCC, namely: knowledge culture (KC) fosters "learning climate" (LCC) via a "collaborative culture" (CC).

KC->CC->LCM, namely: knowledge culture (KC) fosters "acceptance of mistakes" (LCM) via a "collaborative culture" (CC).

According to Garvin *et al.* (2008), learning organizations should be able to adapt to an unpredictable future faster than organizations that are not open to constant learning. Hence, learning is a driver of adaptability to change. Thus, a constant learning culture increases the speed of adaptability to change. Based on this, and bearing in mind the above literature review regarding the importance of the acceptance of mistakes, the following mediations are expected:

LCC->LCM->CHA, namely: "learning climate" (LCC) fosters change adaptability (CHA) via "acceptance of mistakes" (LCM).

Figure 1 presents the theoretical model of the current study based on the above formulated hypotheses and expected mediations.

Figure1

Method

According to deVellis (2017, p. 2), "measurement is a fundamental activity of science." Social science measures focus on social constructs that are not easy to measure directly via e.g. observation. Hence, scales, which are collections of statements which reflect a particular construct meaning, are used to reveal unobserved social variables. According to knowledge culture, collaborative culture, and learning culture, existing scales, do not fully reflect the meaning (definitions) of these constructs, which is the essence of this study. Therefore, Authors proposed the new versions of existing scales to be sure, the current study measure, what must be measured to achieve introduced aims. Further, thorough analysis showed that risks may overlap. For example, the collaborative culture scale of Pérez López *et al.* (2004) reflected the definition of constant learning given by Rebelo and Gomes (2011a, p. 174). Pérez López *et al.*'s (2004) constant learning scale ignored the "acceptance of mistakes" component, but this component was included in Lei *et al.* (2019) "knowledge centred culture" scale. Similarly, the knowledge-centered culture scale proposed by Donate and Guadamillas (2011) and developed by Yang *et al.* (2019) consisted of the components of "learning disposition" and "acceptance of mistakes." Hence, to avoid potential bias, and inspired by Meek *et al.* (2019) and Netemeyer et al. (2003, p. 6), the abovementioned existing scales were revised to more accurately align them to the current study's purpose based on the main definition provided of each construct. The same "personal change adaptability" existing scale refers to career adaptability (e.g., Maggiori *et al.*, 2017) rather than adaptability to organizational change. Hence, to ensure we measure what we are interested in, based on Ployhart and Bliese's (2006, p. 13) definition, we propose a personal change adaptability scale that measures individuals' ability to adapt to change. In summary, we first synthesized statements from prior studies according to given definitions, and the scales were then validated according to procedures used by Meek *et al.* (2019) and deVellis (2017). Table 2 presents a summary of this study stage—namely, the measured constructs, their definitions, and proposed statements.

Table 2

Samples

The scale validation procedure requires a minimum of two separate samples (deVellis, 2017; Merek *et al.*, 2019) to verify the reliability and validity of the proposed scales. To do this, the following samples have been employed:

SAMPLE I is composed of 330 cases gathered among management students at the Gdańsk University of Technology. The sample was obtained in October 2019. Sample quality assessment: total variance extracted on the 84% level, and KMO- Barlett test of the sample's adequacy on 0.796 level have been noted what confirms the sample good quality (Kaiser, 1974; Hair, 2010). Also one Harman single factor test (Podsakoff & Organ, 1986) has been run, the 30% result confirmed that there is no bias.

SAMPLE II is composed of 327 cases gathered among Polish employees working in knowledge-driven organizations via research portal answeo.com. This sample was obtained

from November to December 2019. Sample quality assessment: total variance extracted on the 75% level, and KMO- Barlett test of the sample's adequacy on 0.876 level have been noted what confirms the sample good quality (Kaiser, 1974; Hair, 2010). Also one Harman single factor test (Podsakoff & Organ, 1986) has been run, the 34,5% result confirmed that there is no bias.

Both samples are convenience samples, and all respondents were asked for voluntary participation. The "snowball method" of sampling enabled the researchers to identify respondents who were truly interested in the subject, which influenced the high quality of the answers. Attachment 1 presents the sample descriptions. Tables 3 compares the quality of the samples and the reliabilities of the obtained scales.

Table 3

Confirmatory factor analysis was conducted to assess the convergent and discriminant validity of the models. Each measured construct achieved indicator loadings (standardized) above the reference level of >0.6 (Forner and Larcker, 1981; Hair *et al.*, 2010; Bartlett, 1950). Internal consistency of the constructs was assessed using Cronbach's alpha >0.7 (Francis, 2001) and average variance extracted (AVE) >0.5 (Byrne, 2016; Hair *et al.*, 2010). Further, composite reliability >0.7 (Byrne, 2016; Hair *et al.*, 2010) was used to justify the reliability of the scales. Next, after the positively assessed statistical power of the chosen items, discriminant validity was checked (Forner and Larcker, 1981; Hu and Bentler, 1999; deVellis, 2017). Namely, similar theoretically related constructs were verified to ensure they did not supercharge each other (Fornell–Larcker Criterion). Hence, the square root of the AVE was larger than the correlation observed between the particular constructs, which meant that the discriminant validity of the proposed scales worked properly. Table 4 presents details of this verification.

Table 4

Next, structural models were developed that presented samples from two different groups: students aged 18–24 and employees aged >24 who worked in knowledge-driven organizations. The models were compared to determine what kind of "mental model" (Senge, 2006) they reflected in relation to change adaptability driven by the knowledge culture in two different environments: university and business.

Results

The aim of this study was to determine the extent to which the knowledge culture fosters organizational intelligence via the acceptance of mistakes. The collaboration, knowledge, and learning cultures shape organizational behaviors; hence, all direct and indirect relations of the above variables are examined. Table 5 presents the verification of all formulated hypotheses regarding the direct influences on both samples. Hypothesis H1a, regarding the direct positive influence of the knowledge culture on the learning climate is not significant for both samples. In contrast, Hypothesis H1b, regarding the positive influence of the knowledge culture on the acceptance of mistakes, was significant for both samples but negative for the employee sample. This means that, driven by the knowledge culture of the university, students accept

mistakes, but working adults do not. Hypothesis H2, regarding the positive influence of the knowledge culture on the collaboration culture, was confirmed for both samples. Similarly, hypothesis H3a, regarding the positive influence of the collaborative culture on learning climate, as well as hypothesis H3b, regarding its influence on the acceptance of mistakes, were confirmed. For hypothesis H4, the positive influence of the learning climate on the acceptance of mistakes was confirmed only for students. This was also the case for hypothesis H5, regarding the positive influence of the acceptance of mistakes on adaptability to change. Conversely, hypothesis H6, regarding the positive influence of the learning climate on adaptability to change, was not significant for students but was significant for employees. Table 5 and Figure 2 present the direct results of the study, and Table 6 presents the indirect effects.

Table 5

Figure 2

Note: STUDY I/STUDY II

STUDY I: n = 330 $\chi2(110) = 270$ CMIN/df = 2.46 ML, standardized results, RMSEA = 0.067, 90% CI [0.057, 0.077], CFI = 0.969, TLI = 0.962, ***p < .001.

STUDY II: n = 326 $\chi2(110) = 191.58$ CMIN/df = 1.74 ML, standardized results, RMSEA = 0.048, 90% CI [0.036, 0.059], CFI = 0.972, TLI = 0.966, ***p < .001.

Table 6

Table 6 presents the analysis of the expected mediations. For both samples, full mediation was observed in the collaborative culture relationship between the knowledge culture and "learning climate." This means that the knowledge culture leads to a learning climate only via a collaborative culture for both students and employees. The first difference between samples results was observed for the mediated by also collaborative culture relation between the knowledge culture and acceptance of mistakes. It is complementary for students sample (STUDY I) but competitive for adults (STUDY II). Thus, without the support of a collaborative culture, the knowledge culture has a negative effect on the acceptance of mistakes. It reflects the attitude that if there is knowledge, there is no room for mistakes. The second difference is observed for climate learning and change adaptability via the acceptance of mistakes, which is fully mediated for students sample but not mediated for adults. Hence, mistakes help students foster their adaptability to change. Adults adapt to changes in the learning culture directly from the learning climate, without the acceptance of mistakes. Based on the obtained $R^2 = 0.14$ for adults and $R^2 = 0.05$ for students, it can be concluded that other factors, which are not included in the model, influence the change adaptability of these groups. The most surprising result is the low R^2 obtained for students. It is worth highlighting that these results based on the full structure of all relations presented in the theoretical model. This model is charged by knowledge culture.

Discussion

The presented findings prove that the acceptance of mistakes is vital for adaptability to change. "Change and transformation require two separate but inter-related processes of self-discovery and self-improvement" (Nadim and Singh, 2019, p. 515). Thus, mistakes are probably not the source of learning for those who do not notice them or do not want to learn from them. This explains why the obtained R^2 results are so low and suggests that after conducting this complicated study on the acceptance of mistakes and adaptability to change, we know almost nothing about them. Thus, other variables exist that have not been included in the model, and these should be investigated in more depth. To do this, some hypotheses post hoc have been developed and verified.

Hypotheses "post hoc"—more-in-depth investigation

Based on the above findings, it has been hypothesized that the culture of the environment—university or company—determines the acceptance of mistakes and adaptability to change. To verify this hypothesis, both samples were incorporated, and the relationship between acceptance of mistakes and adaptability to change were examined, including "age" as the moderator. It is hypothesized that the culture of the environment completely changes this relationship. We can conclude this based on the age separation because in the present case, age is consistent with the environment to which the respondents belonged—namely, university or business. Hence, PROCESS macro software (Hayes, 2018) was employed to verify the hypothesized moderation. Figure 3 illustrates the results and Appendix 2a presents the PROCESS output.

Figure 3

As shown in Figure 3 and Appendix 2a, university students did not increase their adaptability to change when they accepted mistakes, but employees did. This confirms the hypothesis that the culture of the environment is vital for learning behaviors. In the present case, the university culture was found to foster adaptability to change, but the business culture did not. When culture is eliminated and we focus only on adaptability to change driven by the acceptance of mistakes, students do not adapt to changes via mistakes, whereas employees do. Continuing analysis of culture influence, knowledge culture, and collaborative culture have been verified as significant moderators of this relationship. Knowledge culture was not significant for this relation, but collaborative culture was significant. Figure 4 and Appendix 2b present the details of these findings.

Figure 4

Figure 4 shows that for students, the more intensive the collaborative culture, the more negative the relationship between acceptance of mistakes and change adaptability. According to "reference group theory'" (Ashforth and Mael, 1989), young people define themselves in light of a particular group, whereas the opposite moderated effect is observed for adults. The

more intensive the collaborative culture, the more positive the relationship between acceptance of mistakes and adaptability to change. This shows the extent of the difference between the university culture and business culture.

The expected factor that can help to better understand the above described situation is "risk." In light of the theory of planned behavior (Ajzen, 1991), the attitude toward risk may be important. Moreover, according to Quintal *et al.* (2010), perceived risk influences decision-making. Hence, people who avoid risk-taking will likely avoid making mistakes due to the fear to failure. To verify this, the risk and age moderating moderation on change adaptability and acceptance of mistakes relation is presented in Figure 5. Appendix 2c presents the PROCESS software output details for this analysis.

Figure 5

Figure 5 shows that failure is a good lesson, but only for those who are brave enough to take this lesson (take a risk). For young people who avoid risk, the effect of acceptance of mistakes on adaptability to change is negative, as observed in Figures 3 and 4. Hence, young people are not likely to take the risk at university. In the broader context of this study (not only Figures 3–5), students follow the university culture, which is understood to be a set of knowledge, collaboration, and learning climate, so they accept mistakes and adapt to changes according to the university's rules. In contrast, adults learn from their mistakes and adapt to changes. Those who are not "risk-taking people" adapt faster and better. Hence, analyzing this effect in the broader context of the entire study, and taking into account the knowledge, collaboration, and learning cultures, which we can define as a business culture, it is clear that this environment does not accept mistakes. This is why employees are so likely to effectively (and probably quickly) learn from them. Business organizations do not accept them, so employees are motivated to learn from them (in am to avoid them). This leads to interesting implications.

Limitations and scientific implications

Given the in-depth investigation presented in this study, the next question is: Are organizations that do not accept mistakes considered learning organizations? On the one hand, in light of Senge's theory of learning organization, being ready to be wrong is a focal point to learn (Senge, 2006). Hence, knowledge organizations that do not accept mistakes may have problems with learning. On the other hand, employees who are working in such kind of organizations are motivated to learn fast (they want to avoid mistakes by learning quickly). In light of the presented findings, that those employees who are not taking risks learn better lessons from errors than those who take risks - this provokes the another question. Perhaps a better question than previous is: Which types of organizations learn faster and better, and which strategy is better in the long run? Those that do accept mistakes or those that do not? This is an interesting area for further research.

Moreover, national intellectual capital levels differ (Labra and Sánchez, 2013). Jamali and Sidani (2008) and Kucharska and Bedford (2019) showed that the context of the country under investigation is important in organizational learning and knowledge sharing studies. It

would be interesting to observe how the presented theory is reflected in the context of countries other than Poland.

The main limitation of this study is that the "students sample" was composed of students from only one university who studied the same subject. Findings obtained using students with a different mindset (e.g., those who study another subject than management) may be different. Moreover, the "business sample" mostly included small- and medium-sized companies (Appendix 1). Hence, the business sample may reflect national (post-communists') culture of Poland. Big companies usually design their own culture fitted to their business aims. Therefore, this study can be replicated for big Polish companies, international companies located in Poland and, for other countries. It would be interesting to benchmark these findings with large companies and across industries or national cultures.

In summary, mistakes are presented here as a precious resource that enables the adaptation and development of intelligence. Hence, this study opens a new area of research in the "management of organizational mistakes."

Practical implications

Knowledge is power, but learning is everything. There is no knowledge if a person is not ready to make a mistake. This is likely the same for organizations that are not prepared for errors. Paradoxically, if the organization is unprepared and does not accept mistakes, their employee learns very effectively and their intelligence grows, but the intelligence of the organization does not. Therefore, the fact that employee intelligence is increasing does not mean that organizational intelligence is increasing.

Organizations must be ready to be wrong to benefit from the development of their employees. However, if they begin to accept mistakes, their employees will not be as motivated to grow. Hence, a love–hate relationship with the acceptance of mistakes is recommended.

Conclusion

This study breaks with conventions of "excellence" and promotes the acceptance of mistakes in organizations to develop organizational intelligence. This study is the first to propose a constant learning culture scale that embodies the acceptance of mistakes and a "learning climate." Further, it empirically proves the value of mistakes. This study exposes the essential paradox of organizations today: if they accept errors, their employees will not grow, but if they do not accept mistakes, their employees will grow, but employee growth is not equal to the growth of organizational intelligence. Thus, referring to Senge's (2006) theory of learning organizations, it is not clear which types of organizations learn faster and better: those that accept mistakes or those that do not. Which strategy is better in the long run? This is an interesting question for future research. Based on the findings presented in this study, a love–hate relationship with the acceptance of mistakes is recommended.

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Appendix 1

Description of samples

	SAMPLE I	SAMPLE II
Gender	Female: 48% Male: 52%	Female: 44% Male: 56%
Age	18–24 years	25–34 (52%) 35–44 (28%) 45–54 (16%) 55–74 (3%) >75 (1%)
Company size	Gdansk University of Technology—large university with more than 100 years of tradition	Small (28%) Medium (31%) Big (21%) Large (9%)
Industries	Education	IT (26%) Sales (13%) Finance (12%) Production (10%) Education (10%) Service (9%) Construction (7%) Healthcare (4%) Logistics (3%) Others (3%)

Appendix 2

PROCESS output

a) Figure 3

```
Model  : 1
    Y  : change adaptability
    X  : acceptance of mistakes
    W  : age
Sample Size:  657

**************************************************************************

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2366      .0560     1.4566     5.1811     3.0000   262.0000      .0017

Model
              coeff         se          t          p       LLCI       ULCI
constant     4.4899      .2883    15.5731      .0000     3.9222     5.0576
mistakes      .2043      .0542     3.7694      .0002      .0976      .3110
age           1.6404      .6265     2.6184      .0093      .4068     2.8740
Int_1        -.3373      .1274    -2.6484      .0086     -.5881     -.0865

Product terms key:
 Int_1    :        mistakes     x        age

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0253     7.0140     1.0000   262.0000      .0086

Level of confidence for all confidence intervals in output:  95.0000
NOTE: Standardized coefficients not available for models with moderators.
```

b) Figure 4

```
Model  : 3
Y  : change adaptability
    X  : acceptance of mistakes
    W  : age
    Z  : collaborative culture (CC)

Sample Size:  657

**************************************************************************
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .3159      .0998     1.4105     4.0871     7.0000   258.0000      .0003

Model
              coeff         se          t          p       LLCI       ULCI
constant     7.7136     1.3885     5.5553      .0000     4.9793    10.4478
mistakes     -.5762      .2784    -2.0697      .0395    -1.1244     -.0280
age          -5.0827     2.2173    -2.2923      .0227    -9.4490     -.7163
Int_1        1.1495      .4949     2.3226      .0210      .1749     2.1242
CC           -.5914      .2690    -2.1982      .0288    -1.1211     -.0616
Int_2         .1393      .0506     2.7522      .0063      .0396      .2390
Int_3        1.2546      .4375     2.8676      .0045      .3931     2.1162
Int_4        -.2721      .0915    -2.9734      .0032     -.4523     -.0919

Product terms key:
 Int_1    :        mistakes   x        age
 Int_2    :        mistakes   x        CC
 Int_3    :        age        x        CC
 Int_4    :        mistakes   x        age        x        CC

Test(s) of highest order unconditional interaction(s):
```

```
         R2-chng          F        df1        df2          p
X*W*Z      .0308     8.8412     1.0000   258.0000      .0032

Level of confidence for all confidence intervals in output:  95.0000
NOTE: Standardized coefficients not available for models with moderators.
```

c) Figure 5

```
Model  : 3
Y  : change adaptability
X  : acceptance of mistakes
W  : age
Z  : Risk taking personality

Sample Size:  657

**************************************************************************
Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .2726      .0743     1.4505     2.9585     7.0000   258.0000      .0053

Model
              coeff         se          t          p       LLCI       ULCI
constant     5.4541      .9390     5.8087      .0000     3.6051     7.3031
mistakes      .0149      .1802      .0827      .9342     -.3399      .3697
age          -2.3928     1.7546    -1.3637      .1738    -5.8481     1.0624
Int_1         .4694      .3469     1.3531      .1772     -.2137     1.1524
Risk         -.6387      .5959    -1.0719      .2848    -1.8121      .5347
Int_2         .1287      .1128     1.1411      .2549     -.0934      .3508
Int_3        2.6412     1.1845     2.2298      .0266      .3086     4.9739
Int_4        -.5361      .2313    -2.3179      .0212     -.9916     -.0807

Product terms key:
 Int_1    :        mistakes x        age
 Int_2    :        mistakes x        Risk
 Int_3    :        age      x        Risk
 Int_4    :        mistakes x        age        x        Risk

Test(s) of highest order unconditional interaction(s):
         R2-chng          F        df1        df2          p
X*W*Z      .0193     5.3727     1.0000   258.0000      .0212

Level of confidence for all confidence intervals in output:  95.0000
NOTE: Standardized coefficients not available for models with moderators.
```

Figure 1

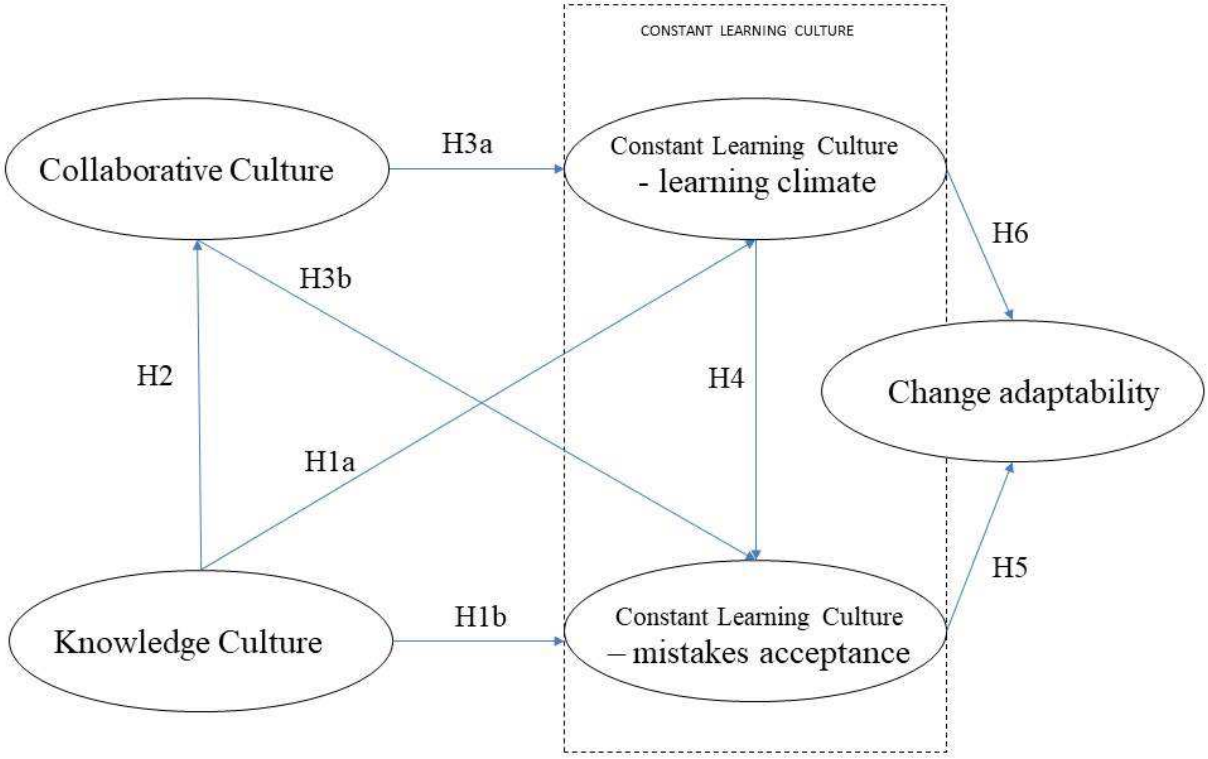
CONSTANT LEARNING CULTURE
Collaborative Culture
H3a
Constant Learning Culture
- learning climate
H6
H3b
H2
H4
Change adaptability
H1a
H5
Knowledge Culture
H1b
Constant Learning Culture
– mistakes acceptance

Figure 2

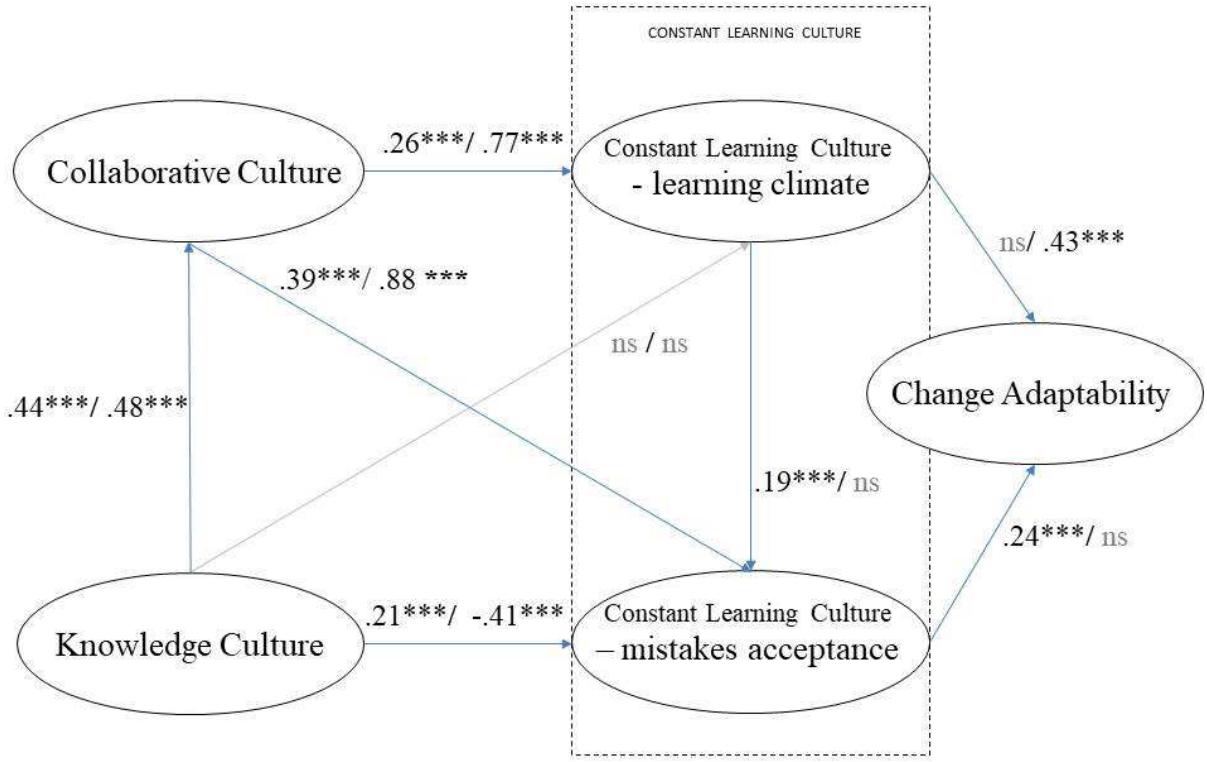
CONSTANT LEARNING CULTURE
Collaborative Culture
.26***/ .77***
Constant Learning Culture
- learning climate
ns/ .43***
.39***/ .88 ***
ns / ns
Change Adaptability
.44***/ .48***
.19***/ ns
.24***/ ns
Knowledge Culture
.21***/ -.41***
Constant Learning Culture
– mistakes acceptance

Figure 3

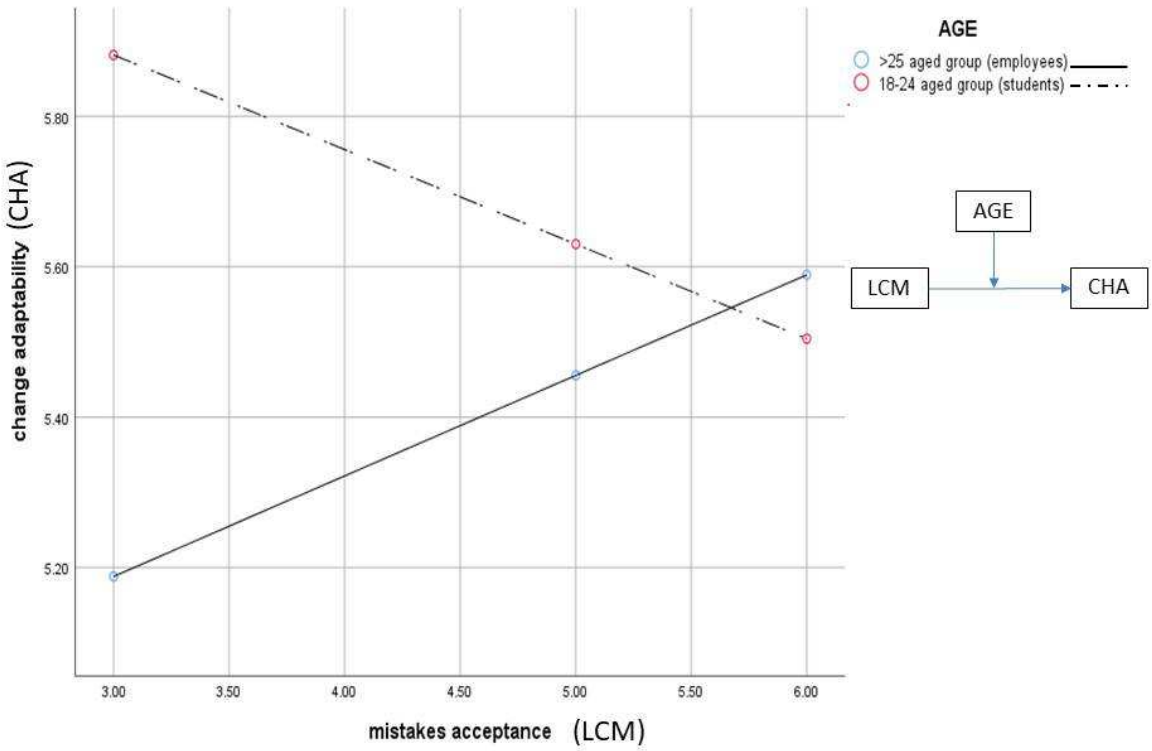
AGE
>25 aged group (employees)
18-24 aged group (students)
change adaptability (CHA)
5.80
5.60
5.40
5.20
3.00
3.50
4.00
4.50
5.00
5.50
6.00
mistakes acceptance (LCM)
AGE
LCM
CHA

Figure 4

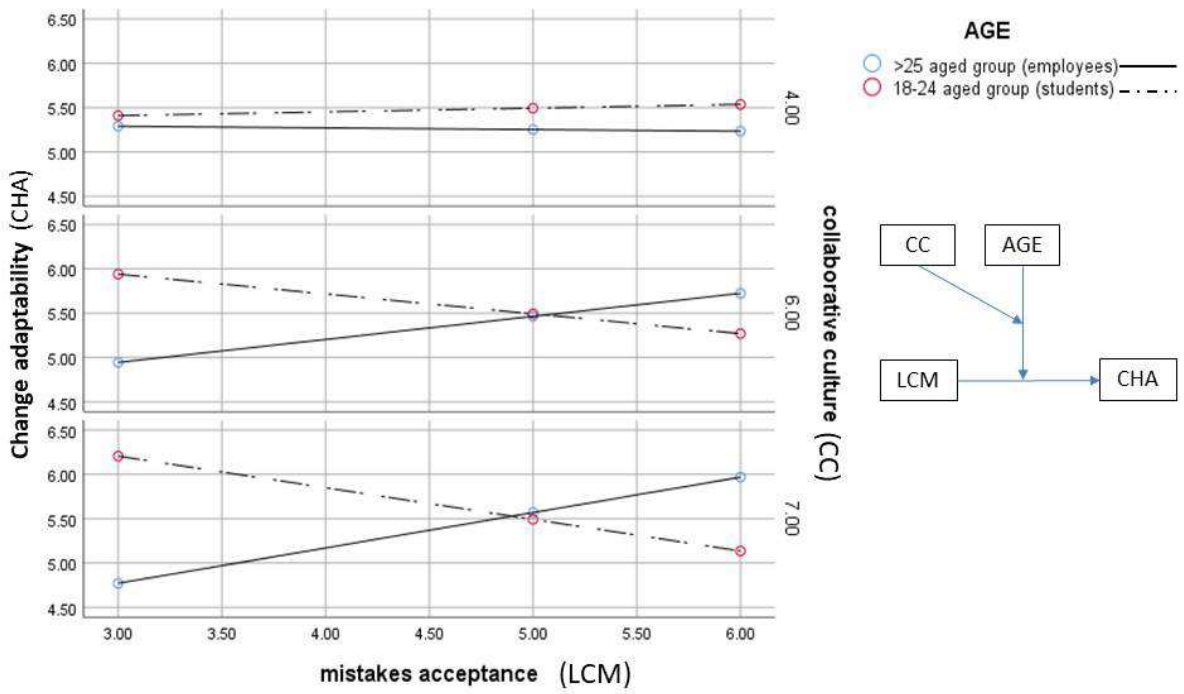
AGE
>25 aged group (employees)
18-24 aged group (students)
Change adaptability (CHA)
collaborative culture (CC)
4.00
6.00
7.00
mistakes acceptance (LCM)
CC
AGE
LCM
CHA

Figure 5

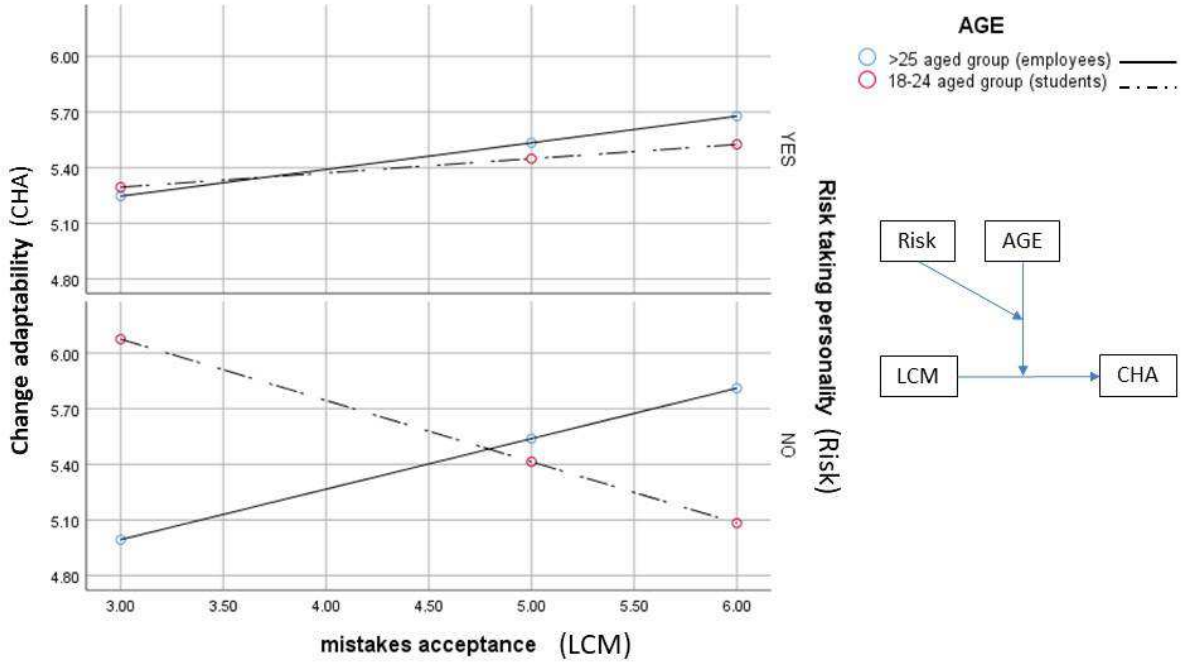
AGE
>25 aged group (employees)
18-24 aged group (students)
Change adaptability (CHA)
6.00
5.70
5.40
5.10
4.80
YES
NO
Risk taking personality (Risk)
3.00
3.50
4.00
4.50
5.00
5.50
6.00
mistakes acceptance (LCM)
Risk
AGE
LCM
CHA

Table 1: Study overview

RQ	How is the acceptance of mistakes related to organizational intelligence driven by knowledge culture?
General aim	The study aims to develop a theoretical model including knowledge, learning, and collaboration cultures to determine how they foster adaptability to change treated as a proxy of organizational intelligence.
Specific aims	1. Identify and validate knowledge, learning, and collaboration culture scales of measurement to ensure the measured meaning of all these constructs is separated.
	2. Identify theoretical and empirical models that examine how knowledge, collaboration, and learning culture, including "acceptance of mistakes," foster adaptability to change treated as a proxy of organizational intelligence.
Main assumptions based on the literature review (Table 2)	Change adaptability creation is a proxy for organizational intelligence (Feuerstein, 1979).
	The existing constant learning scales omit the acceptance of mistakes component, which is fundamental in this study. Hence, the learning culture scale should be revised.
	After thorough analysis of the existing knowledge, learning, and collaboration cultures scales, the risk has been identified that they may overlap. Hence, to avoid potential bias, new scales should be proposed.
	The same "personal change adaptability" existing scale refers to career adaptability (e.g., Maggiori et al., 2017) rather than adaptability toward organizational change. Thus, to ensure we measure what we are interested in, based on Ployhart and Bliese's (2006, p. 13) definition, we propose a personal change adaptability scale that measures individuals' ability to adapt themselves to change.
Research gaps	1. There is a lack of separation between the knowledge, learning, and collaboration cultures scales. 2. The acceptance of mistakes component of learning organization is ignored. 3. We do not know how the acceptance of mistakes influences organizational intelligence.
STUDY METHODS	
Scales and models have been validated based on two samples: STUDY I: Data collected via paper version of questionnaire from October to November 2019. The sample is composed of 330 management students at Gdansk University of Technology, Poland, aged 18–24. STUDY II: Data collected via electronic version of questionnaire from November to December 2019. The sample is composed of 327 employees working in knowledge-driven organizations located in Poland, aged >24. Method of data analysis: 1. Scales reliability and validity (Table 3, Table 4) 2. SEM model (SPSS AMOS 25 software): H1:H6 and mediations verification (Table 5).	
Novelty	This study breaks with conventions of "excellence" and promotes the acceptance of mistakes in organizations to develop organizational intelligence. This study is the first to separate knowledge, learning, and collaboration cultures scales and propose a constant learning culture scale that embodies not only the "learning climate" but also the "acceptance of mistakes," and empirically proves the great value of mistakes.

Table 2: Constructs and statements

Construct	definition	statements
Learning culture	"(..) learning as one of the organization's core values, a focus on people, concern for all stakeholders, stimulation of experimentation, encouraging an attitude of responsible risk, readiness to recognize errors and learn from them, and promotion of open and intense communication, as well as the promotion of cooperation, interdependence, and share of knowledge." (Rebelo and Gomes, 2011a, p. 174). Hence, organizational constant learning culture is composed of "learning climate" and "mistakes acceptance"	"learning climate" dimension: • all staff demonstrate a high learning disposition • we are encouraged to personal development • we are encouraged to implement new ideas every day • we are encouraged to new solutions seeking "mistakes acceptance" dimension: • people know that mistakes are learning consequence and tolerate it up to a certain limit • most people freely declare mistakes • we discuss problems openly without blaming • mistakes are tolerated and treated as learning opportunities Authors synthesis of Pérez López et al. (2004); Donate and Guadamillas (2011); Islam et al., 2013;Lei et al, (2019); Yang et al. (2018) inspired by (Rebelo and Gomes, 2011a, p. 174)
Knowledge culture	Knowledge culture is consisted of all surrounding conditions that support the effective and efficient flow of knowledge throughout the whole organization (Islam et al. 2015).	• All employee perceive knowledge as a value • We have a common language to support knowledge exchange • We are encouraged to share knowledge, ideas and thoughts • We care about quality of knowledge we share Authors synthesis of Suppiah and Singh Sandhu, 2011; Sveiby and Simons, 2002; inspired by Islam et al. (2015).

Collaborative culture	Companies invest to boost collaboration, often this intent is overwhelmed by internal competition (Senge, 2006). Hence authors define organizational collaborative culture as all surrounding conditions that make people cooperate and support each other at work.	• My company supports cooperation between workers • Co-operation among the different duties, teams and departments was encouraged • Co-workers volunteer their support even without being asked • People support each other Authors synthesis of (Pérez Lopez et al. 2004; Barczak et al. 2010); Suppiah Suppiah and Singh Sandhu,2010) inspired by Senge (2006, p.325).
Personal change adaptability	I-ADAPT theory defines adaptability as ‘‘an individual’s ability, skill, disposition, willingness, and/or motivation, to change or fit different task, social, and environmental features’’ (Ployhart and Bliese; 2006, p. 13). If the people do not adapt to change, there is no organizational change (Schneider et al. 1996, p.7).	• I am flexible to changes • I can adjust myself to changes • I adopt to changes easily • I used to changes Authors synthesis (Ployhart and Bliese; 2006, p. 13) inspired by (Schneider et al. 1996, p.7).

Table 3: Samples comparison

Samples comparison	STUDY I	STUDY II
	n=330	n=327
KMO	.79	.89
Barlett test	5395.04(136) ***	3034(136)***
Harman one factor test	31.14 %	33,8%
Total Variance Explained	82%	74%
Common Method Bias	53%	45%
CFA	all covariances<0.61	all covariances<0.77
Loadings		
KC CR=.82./.82 AVE=.53/.54 Cronbachα=.81/.80	.62 .74 .72 .81	.73 .81 .61 .78
CC CR=.90/.87 AVE= 68/.63 Cronbachα=.89/.87	.81 .88 .83 .78	.73 .83 .82 .78
LCC CR=.95/.86 AVE= .83/.60 Cronbachα=.96/.85	.92 .93 .90 .89	.73 .83 .77 .77
LCM CR=.92/.86 AVE= .74/.61 Cronbachα=.94/.86	.85 .89 .86 .84	.77 .73 .80 .81
CHA CR=.90/.90 AVE= .77/.69 Cronbachα=.93/.90	.85 .93 .89 .83	.85 .88 .80 .79

note: STUDY I n=330 / STUDY II n=327, *** p<0.001

KC – knowledge culture, CC – collaborative culture, LCM – learning culture „mistakes acceptance", LCC – learning culture „climate", CHA – change adaptability

Table 4: Descriptive statistics and correlations

variable	Mean	SD	AVE	Cronbach	CR	KC	CC	LCC	LCM	CHA
KC	5.8/6.4	1.06/0.88	.53/.54	.81/.80	.82/.82	**.72/.73**				
CC	5.1/5.5	1.04/1.15	.68/.63	.89/.87	.90/.87	.44/.48	**.82/.79**			
LCC	3.8/5.5	1.02/1.2	.83/.60	.96/.85	.95/.86	.12/.40	.26/.78	**.91/.77**		
LCM	4.8/5.0	1.02/1.5	.74/.61	.94/.86	.92/.86	.39/.08	.52/.27	.32/.69	**.86/.78**	
CHA	5.2/5.4	1.01/1.2	.77/.69	.93/90	.90/.90	.09/.17	.12/.26	.05/.37	.23/.21	**.87/.83**

note: STUDY I n=330 / STUDY II n=327

KC – knowledge culture, CC – collaborative culture, LCM – learning culture „mistakes acceptance", LCC – learning culture „climate", CHA – change adaptability

Table 5: Results

Hypothesis	β	t-value	p-value	Verification
H1a	ns / ns	.14 / .54	.88 /.588	rejected / rejected
H1b	.21 / -.41	3.2 / -5.7	*** / ***	supported / rejected
H2	.44 / .48	6.49 / 6.30	*** / ***	supported / supported
H3a	.26 / .77	3.9 / 9.98	*** / ***	supported / supported
H3b	.39 / .88	6.16 / 7.21	*** / ***	supported / supported
H4	.19 / ns	3.8 / 1,63	***/ .102	supported / rejected
H5	.24 / ns	4.06 / -.89	***/ .369	supported / rejected
H6	ns / .43	-.42 / 4.46	.674 / ***	rejected / supported

note: STUDY I / STUDY II

STUDY I: n = 330 $\chi2(110) = 270$ CMIN/df = 2.46 ML, standardized results, RMSEA = 0.067, 90% CI [0.057, 0.077], CFI = 0.969, TLI = 0.962, ***p < .001.

STUDY II: n = 326 $\chi2(110) = 191.58$ CMIN/df = 1.74 ML, standardized results, RMSEA = 0.048, 90% CI [0.036, 0.059], CFI = 0.972, TLI = 0.966, ***p < .001.

Table 6: Mediations analysis

Mediation	effects		Mediation type observed
	direct	indirect	
KC->CC->LCC	-.012 (ns) /.034 (ns)	.123 (***) /.37 (***)	indirect-only (full)/ indirect-only (full)
KC->CC->LCM	.213 (**) /-.41 (***)	.191 (***) /.49 (***)	complementary/competitive mediation
LCC->LCM->CHA	-.025 (ns) / .43 (***)	.048 (***) / -.014 (ns)	indirect-only (full)/no mediation

note: STUDY I / STUDY II

STUDY I: n=330 $\chi 2(110)=270$ CMIN/df=2.46 ML, standardized results, RMSEA = 0.067, 90% CI [0.057, 0.077], CFI = 0.969, TLI = 0.962, ***p < .001.

STUDY II: n=326 $\chi 2(110)=191.58$ CMIN/df=1.74 ML, standardized results, RMSEA = 0.048, 90% CI [0.036, 0.059], CFI = 0.972, TLI= 0.966, ***p < .001.

Original citation: Kucharska W. & Bedford, D.A.D (2019). Love your mistakes!—they help you adapt to change. The new scale of learning culture. GUT FME Working Papers Series A, No 8/2019(60). Gdansk (Poland): Gdansk University of Technology, Faculty of Management and Economics.

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