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ASSESSING COLLABORATIVE CLIMATE IN ORGANIZATIONS

Abstract: Collaborative climate is one of crucial aspects of knowledge-based economy and influences organizational success greatly. The aim of the research was assessment of reliability and validity of the Collaborative Climate Assessment (CCA) instrument that contains 20 items measuring four constructs: Organizational Culture, Immediate Supervisor, Employee Attitude and Work Group Support. The instrument was tested on the sample of 283 respondents from organizations in Serbia. The unidimensionality of each subscale of the instrument was established along with the research results proving reliability and validity of the modified CCA instrument.

Keywords: Collaborative Climate, Organizational Culture, Knowledge Economy

1. INTRODUCTION

The literature on knowledge-based economy (KBE) and knowledge management (KM) constantly reinforces the notion that a collaborative climate is crucial for the effective performance of the organization. To survive in the global knowledge-based economy, all organizations must address their KM issues in order to keep up with the speed and dynamics of the modern marketplaces (Alee, 2008). They can improve products, services and processes by exploiting their intellectual capital using the full potential of the exchange of tangible and intangible resources (Nonaka & Takeuchi, 1995). It is possible to achieve that only by exploiting dynamic value networks of knowledge-intensive relationships, inside and outside of their enterprise borders (Levy & Powell, 2005).

The concept of collaboration and collaborative climate are crucial aspects of a knowledge-based economy, and they play a vital role in fostering teamwork, knowledge sharing, and collective problem-solving (Sveiby, 2007). They impact organizational effectiveness and are key factors of business strategies for organizations operating in the knowledge economy (Edvission, 2000). A collaborative climate is a work environment that prioritizes open communication, shared goals, and mutual support among employees. It involves a culture of cooperation, trust, and inclusiveness, where individuals are encouraged to freely share their ideas and perspectives (Sveiby, 2007).

Studies suggest that a collaborative climate has a strong correlation with organizational effectiveness, particularly in knowledge-intensive fields (Drašković, 2019). A collaborative environment fosters creativity and innovation and leads to better decision-making due to the collective exchange of ideas and perspectives. Collaboration offers numerous benefits to organizations, including increased productivity, better problem-solving, improved decision-making, and enhanced employee engagement. Moreover, a collaborative climate creates a sense of belonging and fosters a positive work culture. Leadership plays a crucial role in setting the tone for a collaborative environment. Managers must lead by example, demonstrate the desired behaviour, and encourage others to do the same. Communication is also a key element of collaboration, and open and transparent communication channels are essential for information flow, knowledge sharing, and fostering trust among team members. Effective communication also involves active listening and responding to others' opinions and concerns.

A collaborative climate should create an environment that will enable employees to feel comfortable sharing their ideas and expressing their concerns without fear of judgment or repercussions. Trust is the foundation of any collaboration, thus organizations must create a safe space for employees to express themselves freely (Sveiby, 2007). Sveiby and

Simons 2002 emphasize that for knowledge sharing it is of special interest only one specific aspect of an organizational culture, called collaborative climate, which is described as the ‘permeability’ of the human infrastructure for knowledge sharing, and it can be seen as the shared mental space where knowledge sharing and creation take place. Karl-Erik Sveiby is known for his work in knowledge management and organizational development. Some of the instruments and approaches for assessing collaborative climate aspects were developed in Sveiby’s work: Knowledge Mapping, Social Network Analysis (SNA), Knowledge Sharing Survey’s, Communities of Practice (CoPs), Knowledge Management Audits, and so on. His ideas and frameworks are adopted for developing an instrument for assessing collaborative climate. This instrument, known as Collaborative Climate Assessment (CCA), was developed by Sveiby and Simons 2002. In this paper, we focus on that specific CCA instrument for assessing collaborative climate in an organization, and we test if it is possible to apply it in a transitional economy environment. In other words, we test the validity of the instrument for assessing the collaborative climate in organizations in the Republic of Serbia.

2. THE INSTRUMENT FOR ASSESSING COLLABORATIVE CLIMATE IN ORGANIZATIONS

A structured questionnaire was used in the process of creating an instrument for measuring the attitudes of employees in relation to the collaborative climate in the organization. All constructs and their related items used in the questionnaire were taken from published studies and linguistically adapted (Sveiby KE & Simons, 2002). The instrument called Collaborative Climate Assessment (CCA) contains 20 items that measure four constructs: Organizational Culture, Immediate Supervisor, Employee Attitude and Work Group Support each defined by 5 items. In the survey all of the items are measured on five-point Likert-type scales. The scales are anchored by (1) strongly disagree, (2) disagree, with (3) neutral (either agree or disagree) as the midpoint, (4) agree, and (5) strongly agree.

Organizational culture encompasses the shared values, beliefs, norms, and behaviours that characterize an organization. It shapes the way employees interact, make decisions, and approach their work. Assessing organizational culture involves examining the extent to which collaboration and knowledge sharing are embedded within the organization's cultural fabric. This includes evaluating cultural norms related to openness, trust, teamwork, and learning. Organizations with a collaborative culture typically exhibit characteristics such as transparency, inclusivity, and a collective focus on achieving common goals.

The immediate supervisor or manager plays a crucial role in shaping the day-to-day work environment and employee experiences. Through their leadership style and behaviours, supervisors influence employee motivation, engagement, and job satisfaction. Assessing the role of immediate supervisors involves evaluating their leadership practices, communication skills, and support for collaboration. This includes examining supervisors' ability to provide clear direction, facilitate teamwork, and empower employees to share knowledge and contribute ideas. Positive supervisor-employee relationships characterized by trust, respect, and mentorship are indicative of a supportive collaborative climate.

Employee attitude refers to individuals' beliefs, perceptions, and emotions toward their work, colleagues, and organizational environment. Attitudes influence employee motivation, behaviour, and willingness to engage in collaborative activities. Assessing employee attitudes involves measuring their perceptions of collaboration, knowledge sharing, and teamwork within the organization. This can be done through surveys or interviews to gauge employees' levels of engagement, satisfaction, and commitment to collaborative efforts. Positive attitudes toward collaboration are characterized by a sense of ownership, enthusiasm, and willingness to collaborate with others to achieve shared goals.

Workgroup support refers to the assistance, encouragement, and resources available to employees within their immediate work teams or groups. It encompasses the collective efforts of team members to support one another and achieve common objectives. Assessing workgroup support involves evaluating the level of cohesion, cooperation, and mutual assistance among team members. This includes examining team dynamics, communication patterns, and the extent to which team members collaborate effectively to solve problems and share knowledge. High levels of workgroup support are characterized by a sense of camaraderie, shared responsibility, and willingness to help each other succeed.

By incorporating these dimensions into a collaborative climate assessment instrument, organizations can gain a comprehensive understanding of the factors influencing collaboration and knowledge sharing within their workplace. This can lead to targeted interventions and initiatives aimed at fostering a more supportive and collaborative organizational culture.

3. THE RESULTS OF EVALUATING THE VALIDITY AND RELIABILITY OF THE INSTRUMENT FOR ASSESSING THE COLLABORATIVE CLIMATE IN ORGANIZATIONS

As the Collaborative Climate Assessment Instrument contains 20 items evaluating attitudes towards collaboration in the organization, a hypothesis was tested:

H₀: It is possible to identify and measure the attitudes of respondents from the Republic of Serbia regarding Collaborative Climate using the Collaborative Climate Assessment Instrument.

The sample on which the analysis is performed consists of 282 respondents. In the sample, male respondents make up 46.4%, while female respondents make up 53.6%. The predominant age group in the sample is “older than 40”, which makes up 36.7% of the total sample. In terms of education, respondents with “completed high school or higher” are the most numerous and are represented with 51.6%, while the group of respondents with a “master's or bachelor's degree” is represented with 46.6%. The least represented group of respondents is “with doctorates”, as has been expected, with 1.8% of the entire sample.

The psychometric characteristics of the instruments were evaluated by applying Principal Component Analysis (CPA). The analyses were conducted at the individual level.

The aim of the research in this paper was assessing reliability and the validity of the CCA instrument. Initially, the unidimensionality of each subscale of instrument Collaborative Climate Assessment is tested. For this purpose, one-component factor analysis was applied to the items of each of the subscales. Using the criterion that the eigenvalues of the components were greater than 1 and the “Scree plot” criterion, one factor was extracted for each of the subscales. This confirmed that the subscales were unidimensional. In order to determine the reliability of the instrument, an analysis was performed on the entire sample. The results of the analysis for the defined dimensions showed high values, which was in accordance with previous research presented in the literature.

3.1. The validity of subscale Organizational Culture

The measure of representativeness of the sample was assessed by the *Kaiser–Meyer–Olkin* (KMO) test. According to Kaiser's interpretation, the result of 0.762 indicated adequate sampling. Cronbach's alpha, as a measure of internal consistency, was used to assess the reliability of the subscale. The result of 0,778 (Table 5) proved the items were sufficiently consistent to indicate the measure was reliable. The significance of correlations between variables was measured by Bartlett's test of sphericity, which reached statistical significance ($\chi^2= 420.056$; $df=10$; $p=0,000$). This fulfils the conditions that demonstrate the justification of the application of factor analysis.

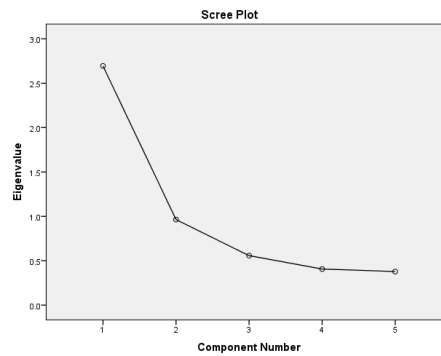
Table 1: Values of component saturations for the first principal component determined by the items of the subscale Organizational Culture

Organizational culture	Factor loadings
We are continuously encouraged to bring new knowledge into the Department	.798
Sharing of knowledge is encouraged by the Department in action and not only in words	.778
Open communication is characteristic of the Department as a whole	.775
We are encouraged to say what we think even if it means disagreeing with people we report to	.771
The people I report to keep me informed	.507

Source: autors, 2024.

The correlation between the factor and the item “The people I report to keep me informed” was found to be moderate (Table 1). However, it was included in the construct because of the adequate average variance extracted (AVE above 50%).

The subscale Organizational Culture can be considered one-dimensional, i.e. to have one measurement subject and to be homogeneous. The conclusion is made based on the amount of explained variance of the first principal component of 53.889%, whose characteristic root is $\lambda=2.694$ (Table 5 and Scree Plot at Picture 1). The Organizational Culture construct is psychometrically valid and reliable because all variables have statistically significant factor saturation (Table 1).



Picture 1: Scree Plot of the components on the items of the Organizational Culture subscale
Source: authors, 2024

3.2. The validity of subscale Immediate Supervisor

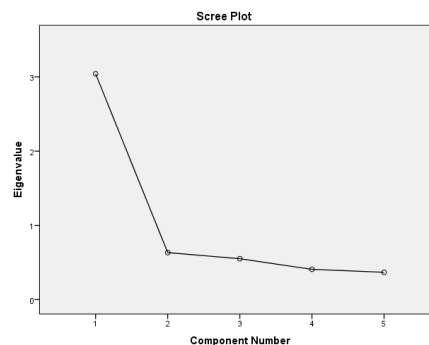
The measure of representativeness of the sample was assessed by the *Kaiser–Meyer–Olkin* (KMO) test. According to Kaiser's interpretation, the result of 0.843 indicated adequate sampling. Cronbach's alpha, as a measure of internal consistency, was used to assess the reliability of the subscale. The result of 0,837 (Table 5) proved the items were sufficiently consistent to indicate the measure was reliable. The significance of correlations between variables was measured by Bartlett's test of sphericity, which reached statistical significance ($\chi^2= 515.111$; $df=10$; $p=0,000$). This fulfils the conditions that demonstrate the justification of the application of factor analysis.

Table 2: Values of component saturations for the first principal component determined by the items of the subscale Immediate Supervisor

Immediate Supervisor	Factor loadings
Encourages open communication in my working group	.837
Encourages – by action and not only words – sharing of knowledge	.811
Encourages me to come up with innovative solutions to work-related problems	.781
Keeps me informed	.756
Organizes regular meetings to share information	.709

Source: autors, 2024.

The subscale Immediate Supervisor can be considered one-dimensional, i.e. to have one measurement subject and to be homogeneous. The conclusion is made based on the amount of explained variance of the first principal component of 60.859%, whose characteristic root is $\lambda=3.043$ (Table 5 and Scree Plot at Picture 2). The Immediate Supervisor construct is psychometrically valid and reliable because all variables have statistically significant factor saturation (Table 2).



Picture 2: Scree Plot of the components on the items of the Immediate Supervisor subscale
Source: autors, 2024

3.3. The validity of subscale Employee Attitude

The measure of representativeness of the sample was assessed by the *Kaiser–Meyer–Olkin* (KMO) test. According to Kaiser's interpretation, the result of 0.849 indicated adequate sampling. Cronbach's alpha, as a measure of internal consistency, was used to assess the reliability of the subscale. The result of 0,865 (Table 5) proved the items were sufficiently consistent to indicate the measure was reliable. The significance of correlations between variables was

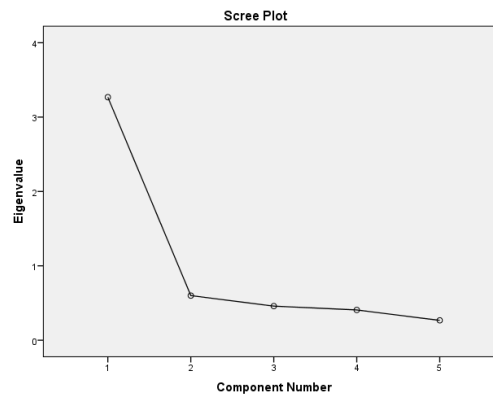
measured by Bartlett’s test of sphericity, which reached statistical significance ($\chi^2= 650.278$; $df=10$; $p=0,000$). This fulfils the conditions that demonstrate the justification of the application of factor analysis.

Table 3: Values of component saturations for the first principal component determined by the items of the subscale Employee Attitude

Employee attitude	Factor Loadings
In the Department, information sharing has increased my knowledge	.876
I learn a lot from other staff in this Department	.830
Sharing information translates to deeper knowledge in this Department	.798
Most of my expertise has developed as a result of working together with colleagues in this Department	.775
Combining the knowledge amongst staff has resulted in many new ideas and solutions for the Department	.758

Source: autors, 2024.

The subscale Immediate Supervisor can be considered one-dimensional, i.e. to have one measurement subject and to be homogeneous. The conclusion is made based on the amount of explained variance of the first principal component of 65.356%, whose characteristic root is $\lambda=3.268$ (Table 5 and Scree Plot at Picture 3). The Employee Attitude construct is psychometrically valid and reliable because all variables have statistically significant factor saturation (Table 3).



Picture 3: Scree Plot of the components on the items of the Employee Attitude subscale
Source: autors, 2024

3.4. The validity of subscale Work Group Support

The measure of representativeness of the sample was assessed by the *Kaiser–Meyer–Olkin* (KMO) test. According to Kaiser's interpretation, the result of 0.707 indicated adequate sampling. Cronbach's alpha, as a measure of internal consistency, was used to assess the reliability of the subscale. The result of 0,642 (Table 5) proved the items were sufficiently consistent to indicate the measure was reliable. The significance of correlations between variables was measured by Bartlett’s test of sphericity, which reached statistical significance ($\chi^2= 237.671$; $df=10$; $p=0,000$). This fulfils the conditions that demonstrate the justification of the application of factor analysis.

Table 4: Values of component saturations for the first principal component determined by the items of the subscale Work Group Support

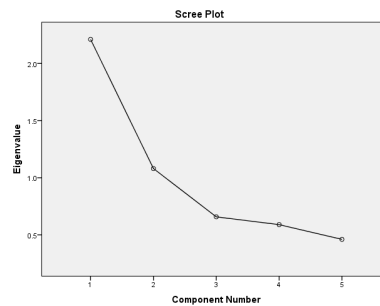
Work Group Support	Factor Loadings
We help each other to learn the skills we need	.786
There is much I could learn from my colleagues	.753
We keep all team members up to date with current events (e.g., news) and work trends	.697
We often share work experiences informally in our unit/section	.697
There are people here who prefer to work on their own	.234

Source: autors, 2024.

The correlation between the factor and the item “There are people here who prefer to work on their own” was not found, and the item was excluded from the Work Group Support subscale (Table 4).

The subscale Work Group Support can be considered one-dimensional, i.e. to have one measurement subject and to be homogeneous. The conclusion is made based on the amount of explained variance of the first principal component of

44.218%, whose characteristic root is $\lambda=2.211$ (Table 5 and Scree Plot at Picture 4). The Work Group Support construct is psychometrically valid and reliable because four variables have statistically significant factor saturation (Table 4).



Picture 4: Scree Plot of the components on the items of the Work Group Support
Source: authors, 2024

In this study, Cronbach’s coefficient alpha was used to calculate the internal consistency coefficients of the items included in the questionnaire. The overall reliability analysis results showed that the items in the four constructs had a satisfactory discriminating power of 0.917 (Table 5—Instrument CCA). The results indicated the satisfactory level of construct validity and internal consistency of this questionnaire. Furthermore, it was suitable for measuring the respondents’ conceptions of assessing the collaborative climate in the organizations.

Table 5: The reliability and variance extracted for the CCA instrument's subscales

Subscale	Cronbach's alpha	%	Λ
Organizational Culture	.778	53.889	2.694
Immediate Supervisor	.837	60.859	3.043
Employee Attitude	.865	65.356	3.268
Work Group Support	.642	44.218	2.211
Instrument CCA	.917		

* Λ - the characteristic root of the first principal component; % - variance extracted

Source: authors, 2024.

4. CONCLUDING REMARKS

Collaboration and collaborative climate are crucial aspects of a knowledge-based economy. They play a vital role in fostering teamwork, knowledge sharing, and collective problem-solving. They impact organizational effectiveness and are key factors of business strategies for organizations operating in a knowledge economy. A collaborative climate is a work environment that prioritizes open communication, shared goals, and mutual support among employees. It involves a culture of cooperation, trust, and inclusiveness, where individuals are encouraged to freely share their ideas and perspectives.

A structured questionnaire was used to measure the attitudes of employees in relation to the collaborative climate in the organization. All constructs and related items used in the questionnaire were taken from published studies and linguistically adapted. The questionnaire called Collaborative Climate Assessment (CCA) contains 20 items that measure four constructs: Organizational Culture, Immediate Supervisor, Employee Attitude and Work Group Support, each defined by 5 items. It was tested on a sample of 282 respondents in Serbia.

The overall reliability analysis results showed that the items in the four constructs had a satisfactory discriminating power, indicating the satisfactory level of construct validity and internal consistency of this questionnaire. The hypothesis “*It is possible to identify and measure attitudes of respondents from the Republic of Serbia regarding Collaborative Climate using Collaborative Climate Assessment Instrument*” was confirmed. Alternatively, it was concluded that the CCA instrument is suitable to measure the respondents’ conceptions of assessing the collaborative climate in the organizations in the Republic of Serbia.

In conclusion, a collaborative climate is fundamental to successful organizations in today's dynamic business landscape. By fostering open communication, shared goals, and a supportive environment, businesses can unlock the collective potential of their workforce and achieve higher degree of innovation and efficiency. Organizations must recognize the importance of collaboration, invest in building a collaborative culture, and implement strategies to enhance it.

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REFERENCES

- Allee V. Value network analysis and value conversion of tangible and intangible assets. *Journal of Intellectual Capital* 2008; 9(1): 5-24.
- Levy M, Powell P. Strategies for Growth in SMEs - The Role of Information and Information Systems. In: *Information System Series (ISS)*, Oxford: Elsevier; 2005.
- Edvission L. Strategy and knowledge creation. In: Von Krogh G, Ichijo K, Nonaka I, editors. *Enabling knowledge creation*. New York: Oxford University Press; 2000, p.69–99.
- Sveiby KE, Disabling the context for knowledge work: the role of managers' behaviors. *Management Decision* 2007; 45(10):1636-1655.
- Nonaka I, Takeuchi H. *The knowledge-creating company*, Oxford university press, 1995.
- Drašković, Zoran (2019), Ključne karakteristike koje utiču na performanse organizacije u ekonomiji znanja, PhD thesis defended jun 2019 at the University of Novi Sad, Faculty of Technical Sciences.
- Sveiby KE, Simons R. Collaborative climate and effectiveness of knowledge work—an empirical study, *Journal of Knowledge Management* 2002; 6(5): 420-433.