The preliminary psychometric properties of measuring tools for identifying transformational leaders in education

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Abstract: School transformation is a real process that is happening all over the world and also in Slovakia. Recently, one of the important topics involved in it is the conceptualisation and measurement of educational leadership. The purpose of this study was to examine the preliminary psychometric properties of the Slovak forms of the Leadership Practices Inventory (LPI; Kouzes & Posner, 2012) and the Czech Leadership Questionnaire (CLQ; Procházka et al., 2016) and to provide a culturally appropriate instrument for Slovak teachers. The study presents the results of the validation under Slovak conditions. The research sample consisted of teachers from different regions of Slovakia. The preliminary psychometric examinations used reliability and construct validity of internal consistency and suggest that both tools appear to be useful in identifying transformational leaders in education. The study is limited by non-standardised tools, research sample specifics, and sampling.

Keywords: educational leaders, transformational leadership, validity and reliability of questionnaires

Preliminarne psihometrične značilnosti merskega pripomočka za prepoznavanje transfomativnega vodenja v izobraževanju

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Povzetek: Spremembe šolskega prostora so proces, ki poteka po vsem svetu, tudi na Slovaškem. Ena od aktualnih tematik, ki so v zadnjem času povezane z omenjenimi procesi je konceptualizacija in merjenje vodenja v izobraževanju. Namen študije je bil preučiti preliminarne psihometrične značilnosti slovaške oblike Lestvice vodstvenih praks (LPI; Leadership Practices Inventory; Kouzes in Posner, 2012) ter Češkega vprašalnika vodenja (CLQ; Procházka idr., 2016) in slovaškim učiteljem ponuditi pripomoček, primeren za tamkajnšnje kulturno okolje. V članku predstavljamo rezultate validacije na Slovaškem. Vzorec so sestavljali učitelji iz različnih regij Slovaške. Preliminarno preverjanje psihometričnih značilnosti je vključevalo preverjanje zanesljivosti, konstrukne veljavnosti in notranje skladnosti. Rezultati kažejo, da sta oba pripomočka lahko uporabna za prepoznavanje transformativnega vodenja v izobraževanju. Omejitve študije vključujejo nestandardizirane pripomočke, specifičnost raziskovalnega vzorca ter postopka vzorčenja.

Ključne besede: vodje v izobraževanju, transformativno vodenje, veljavnost in zanesljivost vprašalnikov

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The topic of transformation leadership has been popular for a long time on the topic of leadership and innovation in the work environment, especially in modern companies. With the growing need for changes in education, especially in post-communist countries as Slovakia, this topic is gradually entering the issue of education. In connection with the need for changes in education, educational leaders as transformational leaders are becoming a highly topical point of discussion. Fullan (2001) pointed out that management and leadership of changes in school improvement are some of the most complex tasks of school leadership. Overcoming obstacles, managing challenges, and problems that accompany change are important steps required of effective leaders of change.

As Judge and Piccolo (2004) noted in their meta-analysis, transformational leadership has been studied more than 'all other theories of leadership combined (eg, least preferred coworker theory, path-goal theory, normative decision theory, substitutes for leadership)' (p. 756). Burns (1978) in his book "Leadership" introduced the theory of transformational leadership and describes transformational leaders as those who transform their followers with their approach, influence their needs, values, or expectations, and desires, through which they are moved ever higher and higher. In addition to Burns (1978) and Bass (1985, 1995), he is considered one of the leading figures in the field of transformational leadership, collaborating with many other prominent experts (Bass & Avolio, 1994; Bass and Riggio, 2006; Bass et al., 2003). The theory of transformational leadership has also been enriched by authors such as Podsakoff et al. (1990), Kouzes and Posner (2017), and in the Czech-Slovak area by Procházka et al. (2016), Baránková (2017), Sollárová et al. (2019), Pašková (2020), Ďuricová (2020), Heinzová and Kaliská (2020) and others. In particular, the authors deal mainly with the issue of transformational leadership in education in the context of Slovak education.

Educational leadership (English, 2006) is understood as the energy and ability to contribute to school development beyond classroom responsibilities. According to this work, teacher leaders are those who work with colleagues to have a greater impact on educational and pedagogical practice throughout their school. Educational leaders have, at the same time, many names and understandings. In a review study, Sollárová et al. (2019) declare that us and European approaches to the conceptualisation of leadership in the educational context differentiate between (a) leadership related to leaders (school leadership, educational leadership) and (b) leadership related to the roles of managers and teachers, these roles being mainly related to the processes of teaching and student learning (educational leadership, teacher leadership). The term "educational leadership" is thus perceived variably, from the equivalence with "school leadership" to the intersection with "teacher leadership". Similarly, this term is used in Slovak conditions and, therefore, it is not established whether the term educational leader means the school management itself or teachers as leaders. The Sollárová research team, which addresses the topic of leaders in education in Slovakia, understands educational leaders as teachers regardless of their position on the job and, at the same time, as leaders who have characteristics related

to the ability to make a change with the ability to inspire change with other colleagues. (Sollárová et al., 2019) This understanding of leadership in education can also be found in the work of Novák et al. (2014), who argue that managerial positions in the school environment are clearly defined. In these positions, we can include all management functions in the educational environment. However, leadership positions can be much broader than managerial positions, and a teacher can be a leader. Leadership is not only a function, but also a characteristic of a personality. Leaders are not just people who want to be in leadership positions. Leadership plays an important role in the school change process (Fullan, 2001). Empirical works in education confirmed links between transformational school leadership and teacher motivation and commitment, and emphasized their importance (Eyal & Roth, 2011). Changing school conditions and motivating teachers significantly mediates the relationship between transformational school leadership and student achievement (Robinson, 2007).

Bass and Avolio (2002) developed one of the most widely used tools, the Multifactor Leadership Questionnaire (MLQ), to identify the type of leadership. The Multifactor Leadership Questionnaire is the standard instrument for assessing transformational and transactional leadership behaviour (Avolio & Bass, 2004). It has been translated into many languages and has been used successfully around the world. Since its inception, it has undergone many changes and improvements, and currently its most used version is the MLQ-5X. Bass (1997) and later also Avolio and Bass (2004) or Bass and Riggio (2006) present the theory of transformational leadership as part of a more complex model of leadership, which also includes transactional leadership and the so-called absence of leadership (no leadership) presented as laissez-faire leadership. Transactional leadership consists of conditional remuneration (involves setting clear expectations and rules for rewarding followers), active management according to exceptions (related to ongoing control and follow-up if the leader's expectations are not met) and passive management according to exceptions (it differs from the active one in that the leader does not check followers on an ongoing basis and corrects their behaviour only after discovering their unsatisfactory results). The absence of leadership, laissez-faire leadership, involves the behaviour of a leader when they are relieved of responsibility and does not fulfil the role of leader. The Czech colleagues Procházka et al. (2016), who also followed this theory when creating their own questionnaire, encountered several obstacles in the Czech environment after verifying the MLQ questionnaire (according to the authors, it was mainly the non-confirmation of the factor structure of the Czech translation of MLQ or the critique of MLQ itself and, last but not least, the need to pay license fees). To this end, they developed the Czech Leadership Questionnaire (CLQ; Dotazník přístup k vedení lidí, DPVL) so that the content of its eight factors corresponds to the four components of transformational leadership, three components of transactional leadership, and laissez-faire leadership. A confirmatory factor analysis conducted on a large sample shows a good fit between the data and the theory and provides evidence of the factor validity of the new

questionnaire. Fit indices indicate a comparable or better fit between the model and the data than in the case of the MLQ (Antonakis et al., 2003). We also use this questionnaire for the needs of our project aimed at transformational leaders in education. The CLQ questionnaire consists of 8 factors of the mentioned types of leadership. For the purposes of our project, we focused only on transformational leadership, so we will describe only those factors that are associated with the mapping of transformational leadership. Procházka et al. (2016) focus on the descriptions of individual leadership factors:

Idealized Influence (or charisma) refers to the behaviour of a leader in which followers identify with their leaders, the identification being based on admiration; for followers, the leader is attractive on an emotional level or in the representation of their convictions. Charisma is associated with motivating followers based on the trust, admiration, and respect they have for their leader (Bass, 1997). In order for a leader to evoke a certain idealisation in his followers, they must show devotion to the organisation and demonstrate certain stability and authenticity.

Inspirational Motivation refers to the behaviour of a leader in which they communicate an attractive vision to their followers. Judge and Piccolo (2004) note that a leader communicates the meaning of goals and their achievement optimistically, whereby the leader expresses their enthusiasm for the goal, transmits this enthusiasm to their followers, and at the same time strongly motivates them. The leader's vision and its significance are inspiring for followers and arouse in them an interest in achieving it. Thus, they realise and understand the common goal and then naturally share it.

Intellectual Stimulation refers to the behaviour of a leader in which they "test" the follower's convictions, encourage creativity, and take risks. It is a kind of stimulation leading to higher performance through framing and mastering alternative perspectives leading to new, better solutions (Bass & Riggio, 2006). With his approach, the leader encourages followers to realise themselves.

Individualized Consideration refers to a leader's behaviour in which they know their followers, express their sincere interest in them through empathy and listening, in order to better meet the needs of the followers, and understand and respect their individual needs while delegating. In this way, it creates and develops an atmosphere of support that helps their learning and personal development (Bass & Riggio, 2006). A leader builds a sense of importance in his followers.

The identification of leaders through the CLQ questionnaire was carried out mainly in the Czech environment, especially by the authors of the questionnaire. In particular, the psychometric characteristics of the CLQ tool were determined. In a sample of 1,084 respondents, a confirmatory factor analysis showed a very good fit between the data and the theoretical model ($\chi^2(436) = 1.146$, CFI = .96, RMSEA = .05). All factors are internally consistent and provide evidence of the factor validity of the CLQ questionnaire (Procházka et al., 2016).

The second concept of transformational leadership and also the second measuring tool, which we use in our research, is the concept of Kouzes and Posner (2017), which was based on their experience working with leaders. Like Bass and colleagues, they created their own tool to map transformational leaders, this time called the Leadership Practice Inventory (LPI), as an empirical instrument to measure the framework of Exemplary Leadership framework (Kouzes & Posner, 2017). Since LPI is also one of the tools we used in our research, we will describe the more detailed practices of leaders defined by Kouzes and Posner (2017).

Model the Way means that what a leader must take along the path to becoming an exemplary leader is inward, to discover personal values and beliefs. A leader must find a way to express leadership philosophy in his own words. The leader must discover a set of principles that guide decisions and show others by their actions that they live by the values they profess; it means consistency between words and actions that builds credibility. Model the way means clarifying values and setting an example.

Inspire a Shared Vision means that a leader practices by his view toward the future. A leader holds in mind the ideas and visions of what can be. They have a sense of what is uniquely possible if everyone works together for a common purpose. The leader is positive about the future and passionately believes that people can make a difference. The leader gets others to see the exciting future possibilities and communicates hopes and dreams so that others clearly understand and share them as their own. They show others how their values and interests will be served by the long-term vision of the future. The leader is expressive and attracts followers through his energy, optimism, and hope. In this way, a leader develops enthusiastic supporters.

Challenge the Process means that leader knows that people do their best when there is a chance to change the way things are. The leader seeks and accepts challenging opportunities to test his skills. In addition, they motivate others to exceed their limits. Similarly, because risk taking involves mistakes and failure, a leader accepts the inevitable disappointments and treats them as opportunities for learning and growth. A transformational leader looks for opportunities to carry out experiments and take risks.

Enable others to Act means that a leader knows that they need partners to make extraordinary things happen in organisations. They build cohesive and dynamic teams, actively involve others in planning, and give them the discretion to make their own decisions. A leader develops collaborative goals and cooperative relationships with colleagues and fosters collaboration by building trust and facilitating relationships by increasing self-determination and developing competence.

Encourage the Heart means that a leader knows that getting extraordinary things done in organisations is hard work, which is why they encourage others not to despair, inspiring others with courage and hope. A leader lets others know their value for the organisation recognises contributions by showing appreciation for individual excellence and celebrates the values and victories by creating a spirit of community.

The leadership practices described in detail by Kouzes and Posner (2017, p. 4) are measurable, and people can develop them and grow to be a transformational leader. The described practices are also factors of their tool for mapping leadership

practices, which is widely used around the world. Posner (2016) based the validation study on the analysis of data from more than 2.8 million respondents to their questionnaire. The issues of both reliability and validity are considered with the conclusion that the LPI is quite robust and applicable across a variety of settings and populations.

We chose these two measurement tools for our project because of their use in mapping transformational leaders. LPI as a widely used tool in mapping leaders in different environments and CLQ because of the cultural proximity to the Czech environment and the ease of transfer to the Slovak environment.

CLQ as a more culturally close and accessible alternative to MLQ in the Slovak context has not yet been used in the context of the identification characteristics of educational leadership, but the baseline MLQ has been used successfully in several cases in this context, e.g., in studies by Van Jaarsveld et al. (2019), Aldhaheri (2021), Bagheri et al. (2015) and Head et al. (2016). All authors confirm the acceptable reliability and validity of MLQ in educational settings. Furthermore, based on their findings, we therefore chose the CLQ as one of the tools to (also) detect transformational leadership for use in our project to identify leaders in education.

LPI is an equally widely used questionnaire to identify transformational leaders in different sectors of practice and has been used in the context of educational leadership, for example, with Turkish teachers, Yavuz (2010), Knab (2009), Quin et al. (2015), Chen and Baron (2007), and its use in educational settings is mentioned in the LPI validation study by one of its authors Posner (2016). The aforementioned authors also stated that this questionnaire is appropriate for the identification of transformational leaders in educational settings.

In Slovakia, even 30 years after the end of the communist regime, there is a great need to transform education and identify the characteristics and competencies of educational leaders. One of the reasons for the need for reforms in Slovak schools is the persistent average to below-average results of Slovak pupils in international PISA comparative tests. (Miklovičová & Valovič, 2019) The Institute of Education Information and Forecasts stated in 2000 that, despite demonstrably democratic changes in society, there are no bottom-up programming proposals. The Ministry of Education of the Slovak Republic and the government should fully support, encourage, and motivate schools and individual teachers, also because there are not enough resources and forces for the classic national reform measures. The leap reforms made so far have not had the desired effect, so the present requires and anticipates dynamic, rapid, and appropriate changes directly in the classroom through the teachers themselves (Aichová, 2000).

Therefore, there is a strong need to identify leaders in education in terms of transformational leaders who will be the bearers of these changes. In addition to the identification of leaders in education, in our project "Psychological approach to development, implementation and evaluation of the competence model of educational leaders' development", we deal with the issue of identifying the psychological competencies of these leaders. At the same time, we developed a model of key competencies of leaders in education and offer training and courses to educate these competencies. For this purpose, it was necessary to adapt the absent questionnaire for the identification of transformational leaders in the Slovak environment, which we would use in our research to identify transformational leaders in education. In our project, we need to verify that the trained skills and competencies will improve and are extended to transformational leadership qualities.

The objective of this research was the initial verification of the validity and reliability of questionnaires designed to identify transformational leaders that are still little used in the Slovak educational environment Leadership Practice Inventory (Kouzes & Posner, 2017) and the Czech Leadership Questionnaire (Procházka et al., 2016). Based on the formulation of research goal, we subsequently set research question: What are the initial psychometric indicators of questionnaires mapping transformational leaders in the Slovak educational field?

Method

Participants

The research sample consisted of teachers from different regions of Slovakia. There were two research samples for our study, that is, for the reliability testing, the LPI questionnaire consists of 382 participants (M_{age}=42.31; SD_{age}=10.58; 19.1% male) and the CLQ questionnaire consists of 405 participants (M_{age}=42.17; SD_{age}=10.60; 14.3% male). The validation research sample for the second part of the study consists of 212 participants (M_{age}= 42.23; SD_{age} = 10.28; 25.0% male) from the research sample who completed both questionnaires simultaneously. The teachers in the entire research sample came from all levels of education, namely kindergartens (9.7%), primary schools (17.1%), secondary schools (21.0%), secondary schools (24.2%), universities (13.3%), and other types of educational institution (14.3%, for example, elementary art schools, leisure centers, etc.). In this study, we did not focus on comparing the transformational leadership profiles of teachers at these school levels, because not all teachers surveyed identified the level of the school where they work and therefore could not make comparisons.

Intruments

Data were collected using two questionnaires, the Leadership Practices Inventory (LPI; Kouzes & Posner, 2012) and the Czech Leadership Questionnaire (CLQ; Procházka et al., 2016). During the adaptation of both scales, they were first translated into Slovak by English or Czech teaching experts; then the Slovak texts were retranslated into English or Czech, compared with the original texts, and found to be identical to them. The *Leadership Practices Inventory* questionnaire (LPI; Kouzes & Posner, 2013) assesses five types of practices of a transformative leader (description of types and factors of the LPI questionnaire, see above), consists of 30 items, with 6 items per factor rated on a 10-point Likert scale (from 1 almost never to 10 almost always). Kouzes and Posner (2016) reported good validity and reliability and that the LPI

Table 1
Descriptive indicators of variables for questionnaires LPI (n = 382) and CLQ (n = 405)

Scale	M	Mdn	SD	skew	kurt	min	max	α
LPI (*n* = 382)								
Model the Way	8.05	8.3	1.19	-0.98	0.58	24.0	60.0	0.70
Inspire a Shared Vision	7.39	7.8	1.46	-0.76	-0.15	19.2	60.0	0.82
Challenge the Process	7.68	8.0	1.36	-0.78	-0.02	19.8	60.0	0.83
Enable Others to Act	8.36	8.7	1.12	-0.90	0.23	31.2	60.0	0.77
Encourage the Heart	7.89	8.2	1.33	-0.86	0.25	22.8	60.0	0.76
CLQ (*n* = 405)								
Idealized Influence	5.46	5.8	1.17	-0.24	-1.22	2.3	7.0	0.93
Inspirational Motivation	5.32	5.3	1.11	-0.14	-1.18	2.8	7.0	0.89
Intellectual Stimulation	5.44	5.3	1.10	-0.22	-1.16	2.5	7.0	0.91
Individualized Consideration	5.39	5.3	1.09	-0.20	-1.04	2.5	7.0	0.92

is quite robust and applicable in a variety of settings and populations. Scales are generally evaluated as gross scores (each respondent score between 6 and 60 for each factor); for the purposes of our study and the comparability of the scores of the factors of the LPI and CLQ questionnaires, we use the factors of the LPI mean questionnaire when evaluating.

The *Czech Leadership Questionnaire* (CLQ; Procházka et al., 2016) evaluates 3 types of leadership: (1) Transformational leadership (involving 4 factors: Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration), (2) Transactional Leadership, and (3) Laissez-faire Leadership. The questionnaire consists of a total of 32 items, which are assessed on a seven-point Likert scale (from 1 almost never to 7 almost always). From the original CLQ questionnaire, we used 16 items related to the transformational leader; the other items were not included in the current research. Procházka et al. (2016) reported good validity and reliability of their scale.

Procedure

The research sample was obtained by combined sampling; specifically, we used a available, intentional, and subsequently snowball selection of the respondents; that is, we contacted the teachers available to us from all types of schools and sent a link to a questionnaire battery for electronic data collection. By filling in the test battery, the respondents gave their consent to anonymous participation in our investigation.

Results

The objective of our research study was to initially verify the validity and reliability of LPI and CLQ, which identify the characteristics of transformational leaders in the Slovak educational environment. We present the basic descriptive indicators of the variables of both questionnaires in two research samples, one for the LPI questionnaire (*n* = 382) and the other for the CLQ questionnaire (*n* = 405) in Table 1.

According to the results in Table 1, the Skewness and Kurtosis analysis, the data of both questionnaires show a normal distribution in both cases. We focus on verifying the reliability of both scales by determining the internal

consistency of the scales using the Cronbach α coefficient. In the LPI factors, the Cronbach α ranged from .702 (Model the Way) to .825 (Challenge the Process), which are satisfactory values indicating good internal consistency of the LPI questionnaire. Cronbach α for all items on the combined LPI questionnaire reached a coefficient of .943, which is also a satisfactory value that indicates a good internal consistency of the LPI questionnaire.

In the case of the CLQ questionnaire (as we mentioned before, only those CLQ factors associated with the mapping of transformational leadership), the individual factors were Cronbach α values ranging from .894 (Inspirational Motivation) to .927 (Idealized Influence), which can again be considered as values that indicate sufficient internal consistency of the CLQ questionnaire in transformational leadership. Cronbach α for all elements of the combined CLQ questionnaire reached a coefficient of .973, which is also a satisfactory value that indicates a good internal consistency of the CLQ factors associated with the mapping of the transformational leadership questionnaire. We can state that in both scales the internal consistency is at a very good level.

We estimate reliability using the split-half method based on dividing the LPI and CLQ questionnaires into two halves, while the Spearman-Brown coefficient was calculated as an indicator of the agreement between the measured results. Its value for the LPI questionnaire is $r_{xx} = 0.864$ and the CLQ questionnaire is $r_{xx} = 0.972$, which can be considered as a fully acceptable internal consistency at the level of the two parts of both the LPI tool and the CLQ tool (16 items of the transformational leadership questionnaire). The result of the split-half reliability analysis is presented in Table 2.

As both tools are in the nature of a questionnaire, it was necessary to verify that this method of data collection may distort the results obtained by both tools. We performed such verification using the Common Method Bias method and found that the data in our research sample did not skew the results from using a non-standardized LPI questionnaire because the total variance extracted by Harman one-factor test is 38.9% and is below the recommended limit of 50% (Podsakoff et al., 2003). For the CLQ instrument, the total deviation extracted by the Harman one-factor test is 49.7%, which closely meets the 50% cut-off criterion.

In addition to the reliability of the questionnaires, we also focused on the preliminary determination of the construct validity of both questionnaires. This we verified by Spearman correlation analysis, as the data from the part of the research sample that participated in this part of the study did not meet the condition of normal data distribution. The mean, standard deviations, and pairwise Spearman correlation coefficients for all variables are shown in Table 3.

All correlations show a positive direction and have a significance of $p < .001$. The correlations between the two questionnaires showed a strong correlation between the Idealized Influence factor of the CLQ questionnaire and the factors of Model the Way, Challenge the Process, and Enable Others to Act of the LPI questionnaire, and Inspirational Motivation and all factors of the LPI questionnaire. In the Intellectual Stimulation factor, a strong correlation was shown with the factors Model the Way, Challenge the Process, Enable Others to Act and Encourage the Heart. The Individualized Consideration factor of the CLQ questionnaire

was strongly correlated with the Enable Others to Act factor of the LPI questionnaire.

A moderately positive relationship was demonstrated between the CLQ Idealized Influence factor and the LPI Encourage the Heart factor, also between the CLQ Intellectual Stimulation factor and the LPI Inspire a Shared Vision factor, and finally between the CLQ Individualized Consideration factor and the LPI factors Model the Way, Inspiring a Shared Vision, Challenge the Process, and Encourage the Heart.

Discussion

The objective of our study was a preliminary test of construct validity and reliability of the construct of the questionnaires. We focus on finding the internal consistency of both questionnaires, which was confirmed by sufficient Cronbach α and Spearman-Brown coefficients in estimating the reliability of questionnaires using the split-half method.

In our research sample LPI five subscales Cronbach α ranged from .702 to .825 and .943 for the total LPI tool. We also estimate reliability using the split-half method and the Spearman-Brown coefficient, and its value for the LPI questionnaire was in our research sample $r_{xx} = .864$. These are satisfactory values that indicate good internal consistency of the LPI questionnaire. Quin et al. (2015) measured internal reliability using Cronbach α ranging from .85 to .92, Posner (2016) presented Cronbach α in the teacher research sample ranging from .78 to .95, and Chen and Baron (2007) presented Cronbach α ranging from .80 to .91 for the five subscales and .96 for the total scale. An acceptable Cronbach α coefficient has been set at .70 (Kerlinger & Lee, 2000), so we can conclude that the LPI questionnaire on a sample of 382 Slovak teachers achieved satisfactory values of the respective coefficients and shows sufficient reliability.

Similar results were observed for the CLQ questionnaire. In our research sample, the four factors of transformational leadership Cronbach α CLQ ranged from .894 (Inspirational Motivation) to .927 (Idealized Influence) and .973 for the four transformational leadership factors CLQ. We also estimate reliability using the split-half method using the Spearman-Brown coefficient for the CLQ questionnaire and the coefficient is $r_{xx} = .972$. As mentioned, the CLQ questionnaire has not yet been used in educational settings, and authors Prochazka et al. (2016) only investigated the reliability of the whole instrument (Cronbach α = .70). Other authors, who used the original MLQ questionnaire on which the CLQ was based and used it in an educational setting, presented its reliability quantified by Cronbach α, eg, Bagheri et al. (2015) show that Cronbach α varies from .62 (Inspirational motivation) to .81 (Idealized influence) and Aldhaheri (2021) presents reliability for the transformational dimensions of MLQ, with scores ranging from .275 (Individual consideration) to .767 (Inspirational motivation). At this point, we can conclude that the CLQ questionnaire used in our study shows satisfactory Cronbach α values.

We confirm the validity of the construct declared by the authors of both questionnaires (Posner, 2016; Procházka et al., 2016) by mutual correlation of the factors of both questionnaires, indicating the mutual compatibility of both

Table 2

Split-half reliability of LPI questionnaire (n = 382) and CLQ questionnaire (n = 405)

		LPI (n = 382)	CLQ (n = 405)
Part 1			
	Cronbach's α	0.886	0.941
	N of Items	15	8
Part 2			
	Cronbach's α	0.905	0.957
	N of Items	15	8
Total N of Items		30	16
Correlation Between Forms		0.760	0.945
Spearman-Brown Coefficient (r_{xx})		0.864	0.972

Table 3

Means, standard deviations and Spearman correlation coefficients between the key variables under study

		LPI				
		MOD	INS	CHALL	ENAB	ENC
CLQ	M (SD)	8.41 (8.7)	7.77 (8.2)	8.11 (8.5)	8.74 (9.0)	8.23 (8.4)
IDEAL	6.41 (6.5)	.54***	.46***	.56***	.55***	.32***
INSP	6.15 (6.3)	.51***	.52***	.49***	.46***	.48***
INTELL	6.26 (6.5)	.46***	.42***	.48***	.60***	.47***
CONS	6.22 (6.3)	.43***	.38***	.40***	.52***	.43***

Notes. MOD – Model the Way; INS – Inspire a Shared Vision; CHALL – Challenge the Process; ENAB – Enable Others to Act; ENC – Encourage the Heart; IDEAL – Idealized Influence; INSP – Inspirational Motivation; INTELL – Intellectual Stimulation; CONS – Individualized Consideration.
*** $p < .001$

approaches to transformational leadership. They are closely related to e.g. characteristics such as identification with the leader, admiration, attraction, trust and respect, which followers have for the leader, with the leader being a role model for them in their approach to work or colleagues. The respect and admiration of the followers are closely related to the fact that the leader accepts their efforts and failures in overcoming the challenges, and such a respected leader actively involves others in planning and gives them freedom in decision-making, etc.

An important part of the validation of the questionnaire methods and the data obtained by them is also the detection of the so-called Common method bias, which serves to detect possible bias in the results in connection with the use of a non-standardised questionnaire. Common-method bias was detected using the Harman one-factor test, the threshold of which is 50%. Within the LPI questionnaire, we found an overall total variance of 38.9% in our study sample, which is below the recommended limit, and for the CLQ tool, the total deviation extracted by the Harman one-factor test is 49.7%, which closely meets the 50% cut-off criterion.

Our study and statistical analysis suggest (after initial validation of basic psychometric indicators) that both tools appear to be useful in identifying transformational leaders in education.

Implications and limitations

There are also limits to the specifics of our study-based research sample sampling, and also to the worldwide situation with the COVID-19 pandemic, that can influence the respondents' situation of the respondents and their self-perception. Due to nonstandardized questionnaires, we verified the presence of the so-called common method bias using this measurement tool and found that the data from our research sample do not skew the results in connection with the use of the nonstandardized LPI and CLQ questionnaires, because the total deviation extracted by Harman's one-factor test for both questionnaires is less than the recommended limit of 50%.

In our study, we validated the reliability and construct validity of two tools designed to identify transformational leaders, and we can confirm reliability as internal consistency and construct validity. Of course, since this was a validation of the basic psychometric characteristics of the tools mentioned above, it is desirable to continue further validation of the functionality of these tools with additional procedures. Further analyses need to focus on the comparison of transformational leadership profiles in teachers from different school levels that have different leadership profiles, and also differences between teachers with different teaching experience that have different leadership profiles.

We believe that our study will not only help trust verified tools (LPI and CLQ) identify the characteristics and practices of transformational leaders in education, but, as Kouzes and Posner (2017) noted, in particular, it is about knowing the strengths and weaknesses of these leaders, which these tools will help identify and teachers can subsequently deliberately develop.

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