Teacher interpersonal immediacy in the Czech education environment: Validity and reliability of the IBU questionnaire

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Abstract

This research study looks at the fundamental characteristics of a good measurement of a newly designed research tool to detect a teacher's level of interpersonal immediate behaviour. The aim was to verify the design validity and reliability of the Interpersonal Immediacy of Teacher questionnaire (IBU) intended for lower-secondary level pupils. Using factor analysis, a five-factor solution was adopted, containing student-oriented immediacy factors, teaching of interpersonal immediacy, teacher positivity, sharing an informal framework and absence of inappropriate teacher behaviour. The reliability of the questionnaire was evaluated based on the Cronbach alpha coefficient as very satisfactory.

Key words: teacher immediacy, questionnaire, factor analysis, reliability, lower-secondary level pupils

Interpersonální bezprostřednost učitelů v českém vzdělávacím prostředí: Platnost a spolehlivost dotazníku IBU

Abstrakt

Výzkumná studie se zabývá základními vlastnostmi dobrého měření nově zkonstruovaného výzkumného nástroje k zjišťování míry interpersonálně bezprostředního chování učitelů. Cílem bylo ověřit konstrukční validitu a reliabilitu dotazníku Interpersonální bezprostřednosti učitele (IBU) určeného pro žáky 2. stupně základních škol. Za pomoci faktorové analýzy bylo přijato pětifaktorové řešení, jehož obsahem jsou faktory bezprostřednost orientovaná na žáky, výuková interpersonální bezprostřednost, pozitivita učitele, sdílení neformální rámce a absence nevhodného chování učitele. Reliabilita dotazníku byla vyhodnocena na základě koeficientu Cronbachovy alfy jako velmi uspokojivá.

Klíčová slova: bezprostřednost učitele, dotazník, faktorová analýza, reliabilita, žáci 2. stupně základní školy.

Introduction

Teaching, which is one of the helping professions, must necessarily take place in a social environment, the core of which is the interaction between teacher and student. In this respect, the interpersonal processes taking place in the context of school education are gaining in importance. Supporting this thesis are the results of various research activities, which often show that a teacher's interpersonal behaviour can significantly influence a students' involvement in educational activities (Brekelmans, Sleegerr & Fraser, 2000; Uden, Ritzen & Pieters, 2014) or improve their learning outcomes (Brok, Brekelmans & Wubbels, 2004). Most of the attention is directed towards the teacher and their behaviour. According to Pollard et al. (2014), this is due to the fact that the development of the interpersonal component in the teacher–student dyad is mainly based on the teacher's initiative. As with the choice of goals and content of the curriculum, the teacher can primarily determine the rules, framework, and form of the interpersonal environment, which are reflected in their routines and rituals related to teaching. However, healthy teacher–student relationships are determined by an adequate mutual interest, which aims to meet the needs of both participants in the interaction.

1 Defining the construct of teacher immediacy

Perhaps the best-known concept relating to the interaction–communication plane of the educational process is the interpersonal style of the teacher. It is a systemic approach based on Leary's theory of personality, which was implemented on a pedagogical level by the team of Wubbels, Créton, Levy & Hooymayers (1993). Gavora and Mareš (2004) developed on this concept in the Czech environment, who adapted in parallel a research tool designed to identify the teacher's interpersonal style. They defined the teacher's style of interaction as relatively stable patterns of behaviour expressed by eight characteristics, namely those of organising, helping, and understanding, leading to accountability, insecurity, dissatisfaction, reprimanding and strictness. The mentioned characteristics are the result of the degree of influence and the degree of proximity applied by the teacher in interactions with students or the class.

In addition to this approach, the construct of teacher immediacy is developed in a relatively isolated manner. On the educational level, the concept of immediate behaviour was taken from the research of social communication by psychologist A. Mehrabian (1966; 1967). In line with his perspective, teacher immediacy is understood as *'a cluster of verbal and nonverbal communication cues that enhance closeness to reduce physical and/or psychological distance between communicators'* (Witt & Zhang, 2016, p. 157). These are manifestations of warmth or accessibility with a positive effect on the participants of the interaction (Guerrero, Andersen & Afifi, 2017). On the general social level, the more frequent and intense this behaviour is, the friendlier, more personal and intimate the relationship of the communicating individuals may become (Pendell, 2003). On the educational institution level, the immediate manifestations of the teacher are understood as effective interpersonal behaviour, which produces a closeness and positive attitude of students toward the teacher. This can include a smile, eye contact, positive facial expressions, or a verbal interest in students and their lives in and out of school (Witt & Zhang, 2016).

2 Research tools to measure teacher immediacy

For the first time ever, immediate behaviour was applied to a higher education environment by J. Andersen (1978, 1979; Andersen & Jensen 1979)[1]. During her doctoral studies, she created a research tool to determine the degree of immediacy of a teacher. These were the Behavioural Indicants of Immediacy Scale containing 15 items that represented nonverbal manifestations of immediacy. The items were formed by statements such as *'This instructor smiles more during class than most others instructors'* or

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[1] This research was closely linked to my supervisor, James McCroskey.

'has a more tense body position while teaching' (p. 547). Based on the seven-point Likert scale, students expressed a degree of approval from strongly agree to strongly disagree. In research practice, there has subsequently been no greater use of this research tool. According to Richmond, McCroskey & Johnson (2003), it had high reliability, but its face value was not satisfactory. More acceptable was her second tool – Generalized immediacy – used in the form of a bipolar scale.

The Teacher nonverbal measure questionnaire, designed by Richmond, Gorham & McCroskey (1987), gained much more interest. This scale consists of 14 items, which focus only on the non-verbal expressions of the teacher. Again, it is intended for use with university students. Items containing statements about teacher behaviour are rated on a five-point scale from never to very often. The statements relate mainly to the degree of expressiveness of the teacher, e.g. the use of various vocal expressions, rich and appropriate gesticulation or establishment of eye contact. Hess & Smythe (2001) drew attention to the issue of the reliability of this tool. In terms of these complications, another expanded version called the Nonverbal immediacy scale (26 items) appeared over the years, in which we also find it in the form of a self-assessment (Richmond & McCroskey, 2000; Richmond, McCroskey, & Johnson, 2003). Nevertheless, Hess & Smythe (2005) encourage caution in drawing conclusions, as they consider that a teacher's behaviour is judged by the students, and therefore the results may indicate their perception rather than the teacher's actual manifestations. This research tool is widely used in revealing the links between immediacy and variables such as student learning, learning engagement, anxiety, and others (see Burroughs, 2007; Mazer, 2013; LeFebre & Allen; 2014). Very good reliability is usually reported, however, results may vary.

Another research tool to detect verbal manifestations of teacher immediacy in this research was developed by Gorham (1988). She derived verbal immediacy from the students' testimony to the question: Who do you think is the best teacher? The questionnaire included 20 statements about the teacher such as: they debate with students on various topics, meet students outside the classroom, use personal examples or give feedback. The concept was not well received at first, as it seemed to measure the effectiveness of the teacher and not to be related to immediacy (Robinson & Richmond, 1995). Subsequently, studies have emerged confirming the relevance of the questionnaire in measuring immediacy (Witt, Wheeless & Allen, 2004; Wilson & Locker, 2008). Despite the controversy of this questionnaire, it is also often used in immediacy surveys due to its reliability (for example, Velez & Cano, 2012). In addition, a 26-item variation is used, which includes verbal and nonverbal manifestations of immediacy (Gorham & Christophel, 1990).

Research by Mottet & Richmond (1998) based on inductive analysis has shown that verbal immediacy relates to diverse communication cues. These include ritual verbal expressions such as 'How are you?' and 'Take care' or 'How are you, do you want to come with us?' These findings suggest that in the case of immediacy, we can speak of entire

acts of communication that are, in a broader sense, considered accessible interpersonal behaviour. Based on this thesis, they constructed a research tool for Chinese university students of which Oetzel & Zhang (2006) considered in particular the cultural differences of the respondents.

3 Aim of the study

There is a growing need to explore the construct of teacher immediacy in elementary education, where, given the developmental aspects of students, it seems to be a relevant variable through which it is possible to push the boundaries of current knowledge about teacher interpersonal behaviour and its effects. We responded to this challenge by constructing a new questionnaire built on a qualitative background, which would be acceptable for Czech elementary education conditions.

The main objective of the study is to verify the design validity and reliability of the Interpersonal Immediacy of Teacher questionnaire intended for pupils at lower-secondary level school.

4 Research methodology

4.1 Designing the Interpersonal Teacher Immediacy Questionnaire (IBU)

A qualitative research was carried out to construct the questionnaire, in which the methods of individual interviews, focus groups and open question interviews (paper–pencil) were applied. The intention was to find out what teachers' behaviour pupils like. The result was three dimensions of behaviour, which we professionally called student-oriented immediacy, educational interpersonal immediacy, and universal friendliness. From the obtained qualitative data, we generated 92 items, the interpretation of which we verified using cognitive interviews with four students. After this step, the items were edited or deleted. Also based on these interviews, a five-point Likert scale was applied using answers ranging from strongly agree to strongly disagree. A total of 81 items were subjected to item and factor analysis.

4.2 Research sample for data collection

The questionnaire was distributed to students online, due to the epidemiological situation in the Czech Republic, during which elementary schools were completely closed.

By a random selection, 4 schools participated in the research survey. Specifically, there were 672 pupils at the lower-secondary level attending school (from the sixth to ninth grade). In terms of gender, the research group consisted of 340 boys and 332 girls.

Results

The assessment of the questionnaire items based on correlation and item analysis led to the removal of some items. Rapid reduction occurred after the use of exploratory factor analysis. For this, we used the statistical program SPSS, and first analysed whether our data is suitable for the factor analysis technique and with what number factors it is possible to work with further. Upon confirmation of suitability (KMO[2] value = 0.975; Barlett's test proved to be significant, $p < 0.001$), we selected the number of components whose eigenvalue was higher than 1 using the Kaiser rule. Table 1 shows the resulting eigenvalues and percentage variations. A five-factor solution that depletes 57.62% of variation proves to be useful.

Table 1
Eigenvalues of components and percentage of variation explained

Component	Eigenvalues total	% of Variance	Cumulative%
1	14.14	39.27	39.27
2	2.39	6.63	45.89
3	1.61	4.48	50.36
4	1.44	4.01	54.38
5	1.17	3.24	57.62

To determine which items are suitable for a five-factor solution, the advantages of the exploratory factor analysis and the Varimax factor rotation method were used. Table 2 shows the factor loads of the 36 selected items[3] in individual factors. The items were chosen based on the amount of the factor load, which we set at a minimum value of 0.40. The results of factors 1 and 2 confirm the existence of our predicted Student-Oriented Immediacy and Teaching Interpersonal Immediacy. However, the dimension of friendliness has been broken down into the factors of Teacher Positivity and Sharing the Informal Framework. Unexpectedly, a new factor arose that we identified as Absence of Inappropriate Behaviour. This factor was saturated by negatively loaded items, which

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[2]   By that is meant Kaiser-Meyer-Olkin Measure of Sampling Adequacy.

[3]   In this study, we only show items that are already acceptable for the research tool.

came from the claims of participants from the focus group. This led us to believe that the degree of immediacy is related to the degree of inappropriate (misbehaviour) or less accommodating behaviour (non-immediacy) on the part of the teacher. In connection to the questionnaire, this means that the higher the degree of absence of inappropriate behaviour, the more the pupils perceive the teacher as an interpersonally immediate person. In this factor there are two items with double saturation, these being the unnecessarily raising of the voice or screaming and a tendency to be quite upset or angry. Although the items fall under factor 4 and 5, they were allocated to the mentioned factor 5 because they belong here both in terms of content and with a higher load value. Further studies and analyses should confirm the location of the items as well as the relevance of the whole factor. The item *The teacher is nice to me* has a similar problem, which was maintained precisely due to the high factor load for the Student-Oriented Immediacy factor (0.607).

Table 2
Factor loads after rotation of Varimax items of the questionnaire Interpersonal immediacy of the teacher

Factor 1: Student – oriented immediacy					
The teacher cares about how I'm doing.	0.717				
The teacher notices my success or progress.	0.671				
The teacher is interested in how I am and how I am doing.	0.669				
From the way I am treated, I think this teacher likes me.	0.659				
Even though something doesn't work out for me, I'm a good student for the teacher.	0.635				
The teacher is nice to me.	0.607	0.402			
The teacher understands when something goes wrong.	0.486				
The teacher addresses me by my first name or as I like.	0.476				
Factor 2: Educational interpersonal immediacy					
Adjusts deadlines for tasks or tests to suit us.		0.651			
When possible, the teacher allows us to do things we enjoy.		0.622			
The teacher creates interesting lessons for us.		0.616			
The teacher does everything to make our school work easier.		0.556			
The teacher tries to make the lessons interesting and entertaining.		0.549			
The teacher adds various interesting activities or stories to the curriculum.		0.536			
The teacher takes part in school events that interest us (excursions, competitions, performances, trips, concerts).		0.504			
Even though the teacher demands more from us, I know it is done for our own good.		0.443			

Factor 3: Teacher's positivity				
The teacher is positively tuned.		0.729		
The teacher is usually in a good mood.		0.703		
The teacher often smiles.		0.699		
The teacher is friendly.		0.629		
The teacher creates a friendly atmosphere.		0.614		
There are relaxing lessons with this teacher.		0.514		
Factor 4: Sharing the informal framework				
The teacher tells us about their life.			0.829	
The teacher also talks to us about topics outside of school, such as personal life.			0.813	
The teacher shares their experiences with us.			0.710	
The teacher discusses interesting things with us that are not just school related.			0.654	
We can talk to the teacher about anything.			0.499	
The teacher can laugh with us.			0.429	
Factor 5: Absence of inappropriate behaviour				
The teacher judges me by my failures.				0.719
The teacher is unnecessarily strict.				0.674
The teacher only notices me if I do something wrong.				0.667
Unlike other students, the teacher often overlooks me.				0.575
I have problems with this teacher.				0.550
The teacher gets pretty upset or angry.		0.405		0.549
Unnecessarily raises their voice or screams.		0.403		0.547
The teacher burdens us with too many activities and tasks.				0.509

The second intention was to find out what was the reliability of the constructed questionnaire. To meet this aim, we chose the method of determining the reliability of the research tool using Cronbach's alpha. Table 3 contains Cronbach's alpha values at the level of individual factors and the overall questionnaire. Based on the results, where $\alpha > 0.80$ within all factors, we can state that the internal consistency of the questionnaire is very good. Overall, reliability even reaches a very satisfactory value, $\alpha = 0.94$.

Table 3

Cronbach's alpha coefficients to verify reliability

Questionnaire with factors	Cronbach's alpha	Number of items
Factor 1: Student-oriented immediacy	0.85	8
Factor 2: Educational interpersonal immediacy	0.82	8
Factor 3: Teacher positivity	0.85	6
Factor 4: Sharing an informal framework	0.82	6
Factor 5: Absence of inappropriate behaviour	0.83	8
Questionnaire with 36 items Interpersonal immediacy of the teacher	**0.94**	**36**

Discussion and conclusion

The current study dealt with the basic properties of good measurement in the newly designed IBU questionnaire, which is primarily intended for determining the immediacy of teachers at the lower-secondary school level. The study presented looked at the basic characteristics of good measurement in the newly designed IBU questionnaire, which is primarily intended to detect the immediacy of a teacher at the lower-secondary school. Since the existing questionnaires were created mainly for Western culture university students, it was necessary to re-design the questionnaire using a new base. Due to this, a qualitative research was carried out in constructing the questionnaire, in which we used the methods of individual interview and focus groups with students in the lower levels of Czech secondary education to be used in Czech traditional primary school environments.

Based on the factor analysis, five factors of the teacher's interpersonal immediacy were accepted. The first factor, Pupil-Oriented Immediacy, consists of eight items including warmth and affection for the pupil in the teacher's behaviour. The second factor is helpfulness in teaching. It contains eight items that determine how much the teacher tries to make school work easier for students or to create interesting lessons. The positivity of the teacher is formed by behaviour involving good mood and friendliness. Another factor reflects the sharing of an informal framework. The items here determine whether the teacher shares memories or experiences with their students. The last, absence of inappropriate behaviour, consists of eight statements, which illustrate, for example, the excessive burden on students or the assessment of a student in terms of their failures. Because there are two items in this factor that have double saturation, it is recommended to perform further analysis. This could show how useful it is to keep or delete items.

As part of the results in this study, it appears that the strengths of the questionnaire are not only the high factor load of items within individual factors and the higher value of the explained variation (57.62%), but also the internal consistency of the questionnaire at the level of both factors and as a whole. The Cronbach's alpha coefficient shows that the reliability of the 36-item questionnaire is shown to be at a very satisfactory value.

Given that intentional random sampling was used in the data collection, it can be said that the condition of representativeness of the sample may not be met. The results must also be interpreted in this respect. It is likely that schools that are willing to participate in data collection attach importance to the interpersonal plane. It is therefore possible that the students who completed the questionnaire scale attend schools that are trying to cultivate education at this level.

Future application of the IBU questionnaire could lead to further development of this tool. It could also enrich the research field with new findings concerning the relationship between the perception of teacher immediacy and the characteristics of primary school students.

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