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Fostering Innovation: Cross-Cultural Adaptation and Validation of Sarsani's (1999) Teacher's Creativity Promotion Scale for University Teachers

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Abstract

Sarsani in India developed the Teachers' Creativity Promotion Scale (1999), which assessed the promotion of creative thinking among teachers. Since creativity is the need of every nation, the researchers wanted to provide psychometric evidence of the scale to Pakistani indigenous researchers. Thus, we took the said scale for revalidation in the Pakistani context by administering the scale to university teachers (*N*=399). The sample comprised 236 male and 163 female university teachers around Pakistan with ages ranging from 20-50 years. The data collected was then analyzed for factor structure using Principal Component Analysis (PCA) by SPSS. Construct validity was also established using Confirmatory Factor Analysis (CFA) through AMOS software. The original instrument used for this research had five factors having 16 items, rated on a 5-point Likert-type scale. The factor analysis of the revalidated version demonstrates that all items form a unifactorial model for the scale which explains 32% of the variance. The scale was also found to be psychometrically valid and reliable. Thus, indigenous researchers in Pakistan could use the revalidated version of the Teachers' Creativity Promotion Scale (Sarsani, 1999) for their local indigenous research.

Keywords: creativity, scale validation, classroom, university teachers

Introduction and Literature Review

In the 21st century, creativity has gained the status of essentialism and an obligation for the world (Guven & Alpaslan, 2022). Creativity must be supervised and assessed because of its extreme importance to human and social development (Askarova, 2022; González & Molero, 2022; Ricci, 2020; Treffinger et al., 2023). Creativity is also significant in researchers' views and is a crucial focus of recent research (González et al., 2020; MacKinnon, 2023; Tang et al., 2022). Teachers' role in the promotion of creativity can never be forgotten. Researchers have opined this belief that creativity must the part of school curricula (Arooj et al., 2021;

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Georgiou et al., 2022; Johansen et al., 2022) because it has a crucial role in teaching (Corrigan et al., 2022; Tiong & Bakar, 2022). Past studies found that promoting creativity grows over time (Treffinger et al., 2023), and that innovative technological techniques can be used to develop it (Cuetos et al., 2020).

A review of literature assessing creativity, the creative climate of the classroom, and creativity promotion among students was conducted. It found the absence of research scales in the Pakistani context, which fits the needs of the population in Pakistan. Thus, there a need to explore, adapt, and validate a scale that must meet the needs of studying creativity and creativity promotion in the Pakistani context was felt. The literature review helps determine the most appropriate scale to be adapted for Pakistan. The review of available research instruments is presented as follows.

Scott (1999) in the USA developed the Scott Teacher Perception Scale (STPS) to examine teachers' perceptions of children's classroom behaviors. It also aimed to assess teachers' attitudes toward creative children and children of average creativity. The scale has two factors, classroom disruptiveness, and creative behavior. However, this scale is irrelevant to our study objectives because our main research objective was to find factors that promote creativity among teachers.

Similarly, in Europe, Cachia and Ferrari (2010) constructed a research instrument comprised of 94 items to understand the current practices followed by teachers and whether these practices are fostering or hindering creativity. The items are to be responded to on a five-point Likert-type scale, from strongly agree to strongly disagree and from always to never. However, this scale is too lengthy and not very relevant to the study objectives. In addition, most often long scales are not favored by respondents; therefore, this scale was not considered for the current study.

Another scale of Al-Nouh et al., (2014) found in the literature consisted of two parts, i.e., attitudes towards creative thinking (19 items) and perceptions regarding creative teaching practices (20 items). The scale was from a Kuwaiti perspective and lacked in factorial analysis i.e., the authors had administered no robust exploratory and confirmatory factor analysis. Therefore, we could not take it for our study, although the scale was piloted, and English department professors had examined the scale and assured that the items of the scale were relevant to the phenomenon under investigation.

The Classroom Creativity Climate Scale (22 items; 04 factors) is another scale developed by Morais et al., (2019) to assess the creativity climate among Portuguese students at the elementary school level. The scale was validated through the EFA (exploratory factor analysis). The alpha reliability coefficients varied from .52 to .80. It might be useful in investigating the perception of Pakistan's students about creative teaching practices and on the self-evaluation of creativity, as well as for diagnosing the climate for creativity in the classroom. However, the scale could not be used to assess creativity promotion among students by teachers. Also, the cultural context of Portugal is very different from that of Pakistan.

Similarly, some of the instruments were identified, which were aimed at teachers. They evaluate various classroom climates for creativity. For instance, Richardson and Mishra (2018) developed an instrument called SCALE: Support for Creativity in a Learning Environment. It was designed to help educators develop learning environments promoting student creativity. This instrument assesses three factors, learner engagement, physical environment, and learning climate. The scale has 14 items, rated on a Likert type scale ranging from "0" (no evidence) to "3" (high evidence). Some examples of the items of this instrument are "the atmosphere is collaborative and friendly", "a variety of resources are available to students", and "students are given time to develop ideas and creative thinking". However, further studies are needed to be conducted to assess reliability and validity.

Furthermore, the Creativity Fostering Teacher Behavior Index (CFTI) was constructed by Soh (2017) to help teachers understand how to create a creative classroom environment. He added that a teacher must be aware of feasible plans and paths to develop creativity among students. This instrument consists of 45 items that evaluate nine classroom characteristics: judgment, flexibility, evaluation, question independence, integration, motivation, opportunities, and frustration. Items of the instrument are phrased as "My students who are frustrated can come to me for emotional support", "In my class, students have opportunities to share ideas and views", and "I encourage students to show me what they have learned on their own". The reliability coefficient (α) for this instrument is .82. The aim of the present review, however, was to identify the scale that could measure creativity promotion among students by teachers.

Sarsani's Teachers' Creativity Promotion Scale is the most appropriate scale for this purpose. It was developed by Sarsasni in the year 1999 for the Indian population. The scale's reliability is greater than .70, providing evidence of the instrument's psychometrically sound nature. The scale comprised 16 total items, which were grouped into five main categories i.e., teaching for self-reliance, responsive, question-expanded thinking, building confidence and relations, and supportive environment. Self-reliance refers to encouraging experimentation that promotes creativity. The responsive category is signified by treating students' questions about fostering creativity. Question-expanded thinking encourages pupils to ask questions to promote creativity. Building confidence and relations constitute having good teacher-pupil relationships that encourage creativity. Lastly, the category of supportive environment underlies providing an exciting and adventurous school atmosphere promotes creativity.

Rationale of Study

The review of literature highlighted the significance of creativity in teaching and learning. However, measurement scales for creativity promotion are unavailable in Pakistan's cultural and social context. Therefore, a valid scale is needed that fits Pakistan's context. Literature review also reviewed different scales among one is the Teachers' Creativity Promotion Scale by Sarsani, developed in 1999 for the Indian context. It was found to be most appropriate for adaptation and validation in Pakistan's context because of the similarity in the culture of both countries and India being one of the closest Asian countries neighboring Pakistan. This scale thus assesses creativity promotion from a multidimensional perspective. Also, being developed for the Indian population, the scale is presumed to be more relatable for the people of Pakistan. Thus, this study was to adapt Sarsani's Teachers' Creativity Promotion Scale in the Pakistani context. The adapted and validated scale could be used afterward by the researchers to evaluate teacher's strategies to promote creativity among the students and the significance of those strategies for their academic performance.

Objectives of Study

The present research aimed to explore the psychometric properties of Sarsani's (1999) Teachers' Creativity Promotion Scale in a Pakistani context with university teachers and explore possible differential responses in the sample.

Materials and Method

Research Design

The study used a survey-based research method to collect the data from participants. It is a method in which a predefined set of individuals respond to questions about a specific topic (Ponto, 2015). To achieve the objectives of the present research, the sample of teachers was the predefined group, and the set of questions was of Sarsani's Teachers' Creativity Promotion Scale (1999) for the adaptation of the scale on Pakistan's population.

Sample

A sample of 399 university teachers was included in the study such that majority of the sample was of male teachers, with age ranging below 35 years old, and were married. Major

proportion the sample is from province of Punjab, KPK, and Baluchistan. The basic demographic characteristics of the sample are mentioned in the table below:

Table 1

Demographic Information of Sample (N = 399)

Variables		Frequency	Percentage	Missing
Gender	Male	236	59%	
	Female	163	41%	
Age (in years)	20-25	44	11%	1
	25-30	72	18%	
	30-35	102	26%	
	Above 35	180	46%	
Marital Status	Married	256	64%	
	Unmarried	140	35%	
	Divorced/Widowed	3	1%	
Province	Punjab	146	37%	
	Baluchistan	71	18%	
	Sindh	8	2%	
	KPK	148	37%	
	Gilgit Baltistan	14	4%	
	Islamabad Capital Territory	12	3%	
Area of Residence	Rural	141	35%	
	Urban	258	65%	
No. of Students	1-10	23	6%	3
	1-20	31	8%	
	1-30	67	17%	
	1-40	92	23%	
	1-50	77	19%	
	Above 50	106	27%	

Instrument

Sarsani's Teachers' Creativity Promotion Scale (1999)

The scale was developed in 1999 and aimed to assess the promotion of creativity during the learning process from teachers' perspectives. Participants were asked to evaluate each item using a five-point Likert scale according to the rating options from 1 *never use* to 5 *always use*. The 16 items of the original scale have five main categories: teaching for self-reliance (e.g., encouraging experimentation promotes creativity), responsive (e.g., treating students' questions with respect promotes creativity), question-expanded thinking (e.g., encouraging pupils to ask questions promotes creativity), building confidence and relations (e.g., having good teacher-pupil relationships promotes creativity), and supportive environment (e.g., providing an exciting and adventurous school atmosphere promotes creativity).

Procedure

The adapted scale was based on the literature survey, the researcher's personal experience, and a review of Sarsani's scale (1999). While adapting the scale, the researcher reviewed the items about clarity, the questions' wording, language suitability, and length of the questionnaire. The items of said scale covered all the aspects of creativity development. No new elements were added to the questionnaires. The participants were approached through the purposive convenient sample and data was collected online from university teachers across Pakistan through Google Forms. The anonymity and confidentiality of data were also ensured to the participants. The data obtained was analyzed by using SPSS and AMOS software.

Sarsani (1999) validated the present scale through Principal Component Analysis (PCA) using Varimax Rotation to each batch of Likert-type items in the scale to justify their inclusion in the questionnaire (Fryer, 1989). Varimax rotation aims to achieve the set of loadings that show the maximum number of questions loading on the minimum number of factors. The idea is that the fewer the factors, the easier it is to invest those factors with psychological meaning (Kinnear & Gray, 1997). Varimax rotation maintains independence among the factors and makes interpreting the resulting factors easier (Kaiser, 1960; Stevens, 1992). Sarsani (1999) retained factors having an Eigenvalue greater than 1. The original scale has five factors which explained 66.9% of the variance.

The present study thus also used Principal Component Analysis and Varimax Rotation for factor structuring. The factor-wise variations are presented in Table 2 below. The factors were teaching self-reliance, responsive, question-expanded thinking, confidence and relations, and a supportive environment. In the present research, the same parameters for factor validation were used as were seen in the work of the original author.

Table 2

Factors Extracted from PCA and Varimax Rotation of Original Scale (Sarsani, 1999)

Principal Component Analysis				Rotated Factor Matrix		
Factors	Eigenvalue	Percent of variance	Cumulative percent	Factors Labelled	Items	Factor Loading
1	4.75	29.7	29.7	Teaching for self-reliance	12	.87
					13	.77
					11	.61
					15	.59
					14	.58
2	1.84	11.5	41.2	Responsive	8	.76
					9	.68
					10	.66
3	1.69	10.6	51.8	Question-Expanded thinking	6	.83
					7	.69
					5	.67
4	1.27	8.0	59.8	Building confidence and relations	2	.85
					16	.63
					3	.62
5	1.14	7.1	66.9	Supportive environment	4	.82
					1	.76

A sociodemographic section was added to the scale. This section recorded various types of information about the participants, such as their gender, age, marital status, province, area of residence, and number of students in a class. The instrument was presented for a pilot study to ensure that the adapted scale was easy linguistically and culturally. For the pilot study, the

scale was presented to a sample of 66 teachers. The main study had a sample of 399 teachers across Pakistan to determine psychometrics and validation of the adapted version.

The coefficient of Cronbach's alpha and Confirmatory Factor Analysis were used to demonstrate the instrument's psychometric properties. Confirmatory Factor Analysis (CFA) was carried out through AMOS. Regression weights and model fit indices obtained from CFA helped to determine the model fit and hence psychometrically sound nature of the instrument was obtained. The Kolmogrov-Smirnov test (p= .000) indicates that the distribution is not normal. However, the skewness and kurtosis values were in range so parametric statistics was used for comparison of means (George & Mallery, 2010).

Results

Psychometric Properties of Sarsani's (1999) Teachers' Creativity Promotion Scale

The reliability was measured using the coefficient of Cronbach's alpha, which is .85 for the adapted scale, thus showing acceptable internal consistency. Principal Component Analysis (PCA) was conducted to test the instrument's validity. Bartlett's test of sphericity was significant ($\chi^2_{120} = 1444.02$, $p = .000$), demonstrating that the sample is adequate to run the factor analysis. The Kaiser–Meyer–Olkin (KMO) test results in the value of .90 which is close to 1, thus suggesting that the data set is adequate for the factor structuring (Field, 2013). The results found that 16 items of the scale contributed to 32% variance in the construct that is, teacher's creativity promotion. The factor analysis was conducted using PCA and Varimax Rotation as used by the original author of the scale (Sarsani, 1999). It results in the extraction of a unifactorial solution such that, eigenvalues of all items are greater than one. The items retained and organized according to the factor loading in the respective factor are listed in Table 3.

Table 3

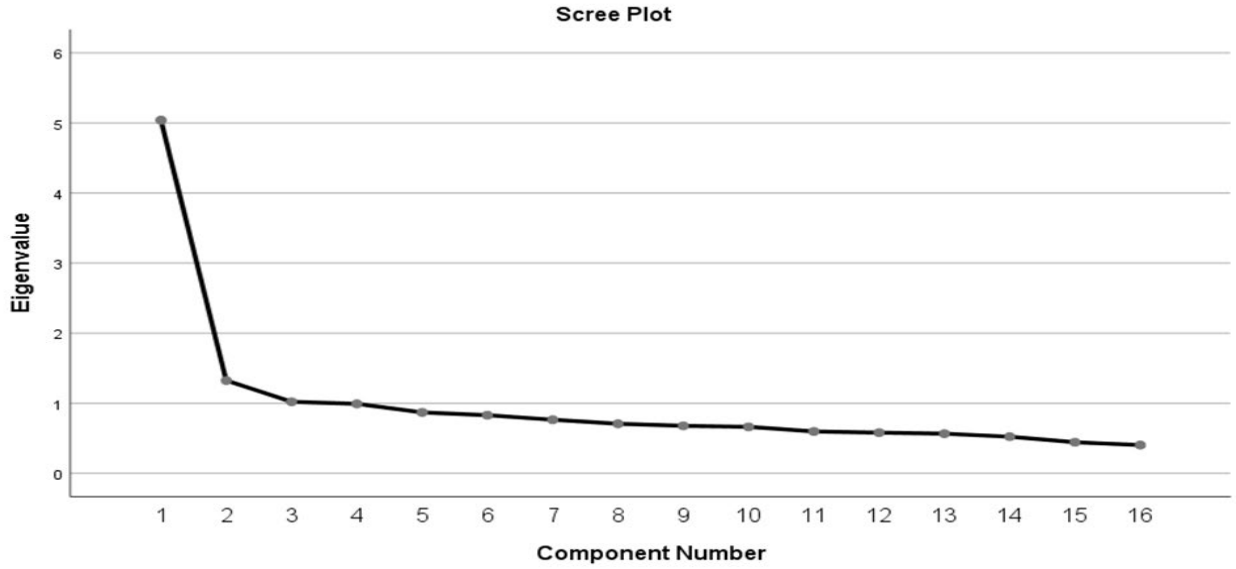
Factor Loadings for Adapted Sarsani Teachers' Creativity Promotion Scale (16-items) Through Principal Component Analysis (N=399)

Item	Factor loadings	Item	Factor loadings
1.	.66	9.	.58
2.	.64	10.	.60
3.	.62	11.	.46
4.	.60	12.	.47
5.	.60	13.	.44
6.	.65	14.	.43
7.	.55	15.	.35
8.	.58	16.	.61

The table indicates that factor loadings for all 16 items were good (> .30) indicating a reasonable contribution to explaining the variance in construct. All the items are thus retained. The items represent a unifactorial structure which explains 31.49% of the total variance. The scree plot also demonstrates one component as lying above the inflection point.

Figure 1

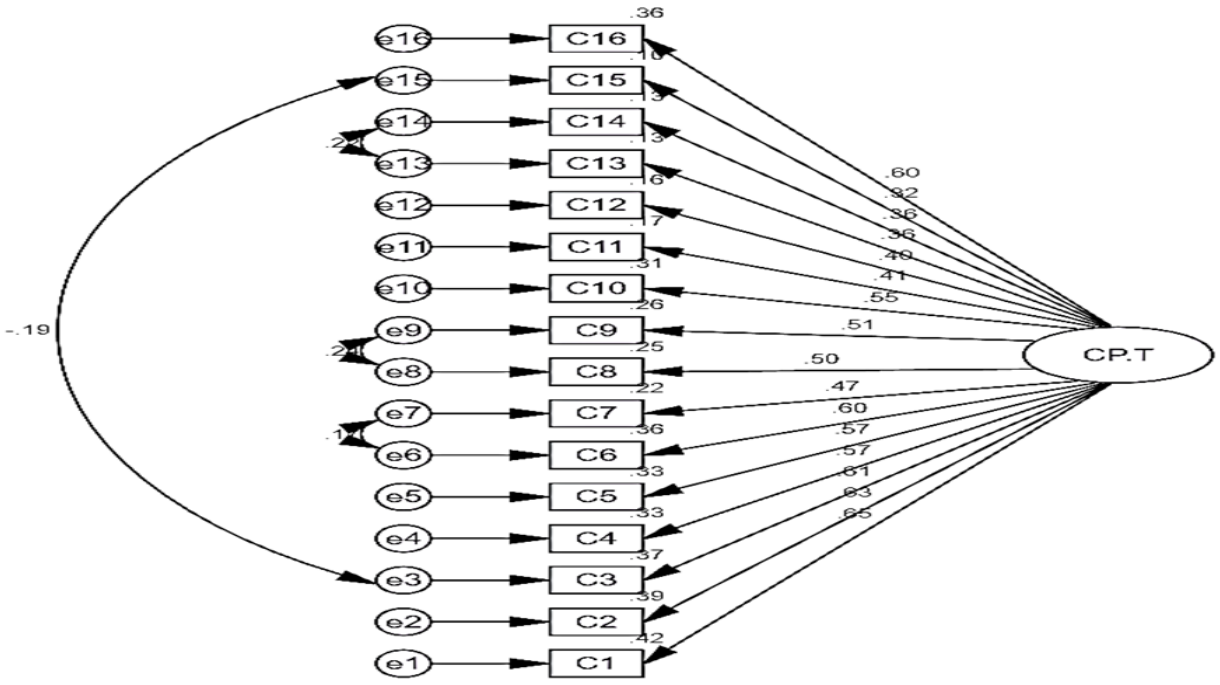
Scree Plot Showing Extracted Factor of Adapted Sarsani Teachers' Creativity Promotion Scale



The factor structure was further confirmed for the model fit using the Confirmatory Factor Analysis (CFA). The regression weights obtained were greater than .35, thus indicating the adequacy of items contributing to the total score on the variable. The regression weights are demonstrated in the figure below:

Figure 2

Regression Weights of the Respective Items of Adapted Sarsani Teachers' Creativity Promotion Scale



The goodness of fit indices is mentioned in the table below, which provides evidence that the unifactorial structure obtained fits our data and can be considered good in the Pakistani population.

Table 4

Indices of Model Fitness Obtained from the Confirmatory Factor Analysis (N=399)

Model	χ^2	*df*	*p*	CMIN/*df*	Fit indices			
					CFI	NFI	TLI	RMSEA
Model-1 Second Order CFA (16 items – without error covariances)								
	244.29	104	.000	2.35	.90	.84	.88	.06
Model-2 Second Order CFA (16 items- with error covariances)								
	181.72	100	.000	1.82	.94	.89	.93	.04

Differential Responses in the Sample

Likewise, the *t*-test was applied to compare the means obtained in the instrument between men and women (t = 1.646, p = .387) and ANOVA tests to contrast age (F =.315, p=.814), place of residence (F = 3.151, p = .077), the number of students attended (F=1.637, p=.149) and the province (F=1.678, p=.139). In none of the cases were significant differences observed in the test results.

Discussion

The creative climate facilitates an individual's creative abilities (Dias & Barroso, 2020; Morais et al., 2019). Creativity is also significant in the school environment as it enhances the student's ability to develop interest, learn better, and retain the learning (Georgiou et al., 2022; Guven & Alpaslan, 2022; Ricci, 2020). Identifying promising and harmful conditions in this space is essential to change educational practices. One of the ways to examine the extent to which the classroom climate favors creativity is through student assessment (Long et al., 2022; Wannapiroon & Pimdee, 2022). That is why it is necessary to have instruments with adequate psychometric properties adjusted to the socio-cultural context, allowing diagnoses and proposals for improvement with sufficient certainty and scientific support.

The studies in Pakistan also have highlighted the significance of creativity among students resulting in improving academic performance (Bano et al., 2021; González et al., 2020). Bashir et al., (2020) explored creative thinking among students and teachers' perceptions of students' creative abilities. The promotion of creative thinking among students is of significance too; however, there is a limited number of instruments to assess it. There also exists no indigenous or adapted scale to study this topic in the educational system of Pakistan. It is addressed by the present study, which aimed at adaptation of the scale to assess the promotion of a creative climate in the classroom.

The validation of Sarsani's Teachers' Creativity Promotion Scale (Sarsani, 1999) was carried out through exploratory factor analysis (EFA), which provides support for unifactorial solutions (see Table 3). Also, it is supported by the scree plot (see Figure 1). The unifactorial solution was validated through confirmatory factor analysis (CFA), which resulted in the fitness of indices for our data (see Table 4). The scale's reliability estimates also support the items' internal consistency. The findings thus provide evidence for the psychometrically sound nature of the scale.

This instrument may offer educators' information to aid in designing a learning environment that could enhance students' creativity. Its focus is on assessing the classroom environment instead of the individual level of creativity. It is imperative to invest in the transition from standardized and

traditional teaching to a paradigm of creative education (González & Molero, 2022; Long et al., 2022; Shermukhammadov, 2022). It is hoped that it will help to meet the challenges of 21st-century classrooms (Corrigan et al., 2022; González et al., 2020; Tang et al., 2022).

Studies focused on analyzing the differences in creativity in men and women have not identified differences (González & Molero, 2022); this is similar to what was found in this study in which no differences between men and women were identified, nor by their age and other sociodemographic variables analyzed.

Conclusion

The contemporary study explored teachers' perception level regarding creativity promoters and the role of certain demographic features such as age, academic, and professional qualification. The results designate that Pakistani teachers identify and favor the promoters given in the survey and hold a positive perception of creativity. Regarding the role of demographic features, changes in teachers' age and academic qualifications are significantly associated with their perceptions of creativity promoters. In contrast, no difference was found with respect to teachers' professional qualifications. Therefore, it is recommended that creativity must be included in the school curricula at the various educational stages because Pakistani teachers perceive the promoters of creativity positively. Besides, teachers should receive professional development programs to bridge the gap between knowledge and practice in promoting student creativity. Meeting students' creative needs not only helps them acquire academic success (Akram & Yingxiu, 2019) and high moral well-being (Akram et al., 2021) but also keeps their psychological health stable (Bhutto et al., 2019; Cuetos et al., 2020).

Implications and Future Recommendations

Current academic practices must evolve to meet the challenges and demands for progress in the Pakistani and global society, economy, and context. Within the complementary analyses, we did not find differences in sex, age, number of students, or place of residence. However, it is necessary to continue analyzing and contrasting these results with the effectiveness of the academic systems and labor insertion to increase the relevance of creativity in the classroom and improve psycho-pedagogical and teaching practices with innovative elements.

It is essential to recognize some of the study's limitations to continue developing research that addresses these aspects and strengthens the findings. In addition, due to time and resource obstacles, this study is limited to only Pakistani teachers at the local level and teachers at the University level, so replicating the study with teachers at basic educational levels is essential. Another study limitation is that the authors used the adopted and self-reported survey. Due to time limitations and restricted resources, we could not develop our instrument for data collection.

Furthermore, future studies can be conducted to examine the instrument's convergent validity with other scales examining similar constructs like creativity, creative climate, and creative motivation. Discriminant validity could also be determined by using the instruments measuring constructs not similar to creativity, like boredom and lack of interest. The concerned authorities and policymakers also should be aware of certain demographic variables' differences' effect on teachers' perceptions of creativity. Hence, teachers' demographic variables and differences should be monitored closely while attending professional development programs and during their instructional practices.

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