

VALIDATION OF THE ATTITUDE TOWARDS TEACHING SCALE USING ITEM RESPONSE THEORY: A STUDY AMONG SECONDARY SCHOOL TEACHERS OF SBS NAGAR DISTRICT (PUNJAB)**Mamta**

Research Scholar, Department of Education, Lovely Professional University, Phagwara Punjab

mamtabhumbla21@gmail.com**Vijay Kumar Chechi**

Guide, Department of Education, Lovely Professional University, Phagwara Punjab

chechivijay@gmail.com

ABSTRACT

In the present study, the item response theory (IRT) based psychometric validation technique was used to assess the measurement properties of Teacher Attitude towards Teaching (TAT) scale for 153 secondary school teachers of the district SBS Nagar, Punjab. This instrument began with 15 Likert-type items with five ordered response categories, which were analysed by Samejima's Graded Response Model (GRM). The original unconstrained GRM resulted in scores between 0.082 and 1.901, and four items (I1, I4, I7 and I13) were eliminated for poor discrimination, leaving 11 items. The retained items gave a range of discrimination values from 0.356 to 1.999 ($M \approx 0.907$) with I10, I9, and I15 being the best discriminators. Likelihood-ratio test (LRT(10)) was applied to determine whether the unconstrained model was more likely than the constrained model, and the result was that the unconstrained model was more likely, $LRT(10) = 28.52$, $p = .001$, and item discrimination was found not to be uniform. The Item Information Curves illustrated complementary coverage and the Test Information Function demonstrated the greatest precision in the lower to middle portion of the trait continuum with less precision at the high end of the trait continuum. The reliability of this instrument was measured using ordinal alpha (0.689) and McDonald's omega (0.690) which resulted in moderate but acceptable reliability for a first validation step. The results provide some initial validation of the 11-item TAT instrument and serve to identify the need for additional validation of the instrument with larger, independent samples.

INTRODUCTION

Attitude towards teaching is an important psychological and professional construct that influences teachers' behaviour, classroom practices, professional commitment, and overall effectiveness in the teaching-learning process. Teaching is not merely the transmission of knowledge; it is a complex and dynamic profession that requires subject knowledge, pedagogical skills, emotional understanding, patience, dedication, and a positive orientation towards learners. A teacher's attitude towards teaching plays a significant role in shaping the classroom environment, motivating students, managing classroom activities, and promoting meaningful learning experiences. Attitude may be understood as a relatively enduring tendency to evaluate a particular object, activity, or situation favourably or unfavourably. In the context of teaching, attitude refers to teachers' beliefs, feelings, perceptions, and behavioural tendencies regarding the teaching profession and its associated responsibilities. A positive attitude towards teaching may be reflected in enthusiasm for classroom instruction, willingness to adopt innovative teaching methods, concern for students' individual differences, professional development, and commitment to educational goals. Conversely, a less favourable attitude may be associated with reduced professional enthusiasm, resistance to instructional changes, or limited engagement in teaching-related activities. However, teachers' attitudes are influenced by several personal, institutional, social, and professional factors and should not be interpreted in isolation from their working conditions.

In the contemporary educational environment, teachers are expected to perform multiple roles, including facilitator of learning, mentor, evaluator, classroom manager, and promoter of students' social and emotional development. Educational reforms, technological advancements, learner-centred approaches, inclusive education, and changing societal expectations have further increased the complexity of teachers' responsibilities. Consequently, understanding teachers' attitudes towards teaching has become an important area of educational research. An assessment of these attitudes can help researchers and educational administrators understand

teachers' professional orientations and identify areas where appropriate support, training, and development programmes may be required.

The attitude of teachers towards teaching is particularly important because teachers' beliefs and perceptions may influence their instructional decisions, relationships with students, classroom management practices, and responses to educational challenges. Teachers who demonstrate a constructive orientation towards their profession may be more willing to explore innovative pedagogical strategies, encourage student participation, and reflect on their teaching practices. Nevertheless, attitude is a multidimensional construct, and its relationship with actual classroom performance may vary according to individual characteristics, institutional resources, workload, leadership, and the broader educational context. Therefore, the systematic assessment of attitude towards teaching requires a clear conceptual understanding and an appropriate measurement instrument. The attitude of the teacher towards the teaching profession has been found to have a significant influence on classroom practice, commitment to the teaching profession, and student outcomes. Attitude is a latent trait, and can therefore only be measured indirectly by scales that require self-report, so the psychometric qualities of these scales are crucial to valid interpretation. Most teacher-attitude scales, however, are still validated via Classical Test Theory (CTT), which provides one reliability value for items across the total scale and is unable to demonstrate the differential item functioning of individual items at various levels of the underlying trait. To overcome this disadvantage, IRT models the relationship between the response data and the underlying trait and can be used to examine item- and scale-level precision at any point on the continuum. The most popular IRT approach for Likert type items in which the response categories have an ordered structure is a model known as the Graded Response Model (GRM) which estimates a discrimination parameter and a set of category-threshold parameters for each item. This is the present study where the Attitude towards Teaching (TAT) scale has been validated by using GRM technique with secondary school teachers of SBS Nagar district, Punjab. Specifically, it is intended to identify and eliminate poorly discriminating items, as well as to compare constrained and unconstrained GRM specifications, explore item- and test-level information to determine the trait region of highest measurement precision and to estimate internal consistency using ordinal alpha and McDonald's omega as an initial item-level psychometric validation of the instrument. Attitude scales in the study of teacher attitudes (traditional studies). The majority of current scales that assess teacher attitudes have been psychometrically validated. Sangwan et al. (2021) created a scale of attitude of higher education teachers towards online teaching and learning after the expert review and item analysis, the original 37 items have been reduced to 4 factors with Cronbach's alpha .88 and split-half correlation .82. Recent studies that examined teachers' and pre-service teachers' attitude towards the post-pandemic instructional scenarios also used exploratory and confirmatory factor analysis to confirm the factor structure of the scales before reporting scale-wide reliability. Despite its less comprehensive results, these studies demonstrate that classical validation is still the preferred approach in these publications and produces only a single reliability score for the whole scale itself, not information about how individual items work. Use of IRT and Rasch methods for teacher-related and attitude measurements. There is a smaller number of studies that have utilized item response modelling for teacher related instruments. The teachers' perceptions of personnel and physical resources supporting inclusive education have been explored through Rasch analysis, allowing for assessment of the quality of measurement and the use of item-fit and person-separation statistics to supplement alpha. Samejima's graded response model has also been used to define poorly discriminating items for dropping and to determine measurement precision (test information) as a function of the continuum of attitudes or engagement for student and professional samples, both of which usually have greater precision at low-to-moderate levels of the trait than at the extremes. These are applications that are not directly related to the teacher-attitude field, but illustrate the additional value of IRT over traditional test methods. The Graded Response Model. In the case of ordered polytomous responses like likert items, there are two-parameter logistic models, but Samejima's (1969, 1997) GRM extends this model to include a set of ordered threshold parameters and a discrimination parameter per item. A principled means of comparing the constrained (common-discrimination) and unconstrained (item-specific discrimination) versions of the model is provided by likelihood-ratio testing, which enables the statistical testing of whether items measure meaningfully differently. Ordinal reliability. Standard Cronbach's alpha (based on Pearson correlations) can underestimate or misestimate reliability since it is an ordinal measure. Two more suitable measures of internal consistency for ordinal attitude data are suggested in the psychometric literature: ordinal alpha from a polychronic correlation matrix and McDonald's omega which does not demand equal item loadings.

Gap as addressed in this study. Collectively, this literature demonstrates that classical validation is the dominant method for development of teacher attitude scales, whereas the use of GRM for this type of validation is not commonly used, and has not been used with the TAT scale previously.

3 METHODOLOGIES

3.1 Research Design

For the present examination of the measurement properties of the Teacher Attitude Towards Teaching (TAT) instrument, the item response theory (IRT) -based psychometric validation approach was used. Initially, there were 15 items that were asked from the 153 respondents. IRT-based approach was used as the primary method of validation and emphasized the item level characteristics and measurement information, given that the sample size was $n = 153$. Data were analysed with the Graded Response Model (GRM) developed by Samejima (1997) for ordered polytomous response categories.

3.2 Instrument And Response Format

The TAT instrument was made up of 15 Likert-type items having five ordered responses. The item responses were analysed in the form of ordered categorical data. The aim of the analysis was to select items that were meaningful in measuring the latent trait, to make the scale more precise, and to look at item information at various levels of Teacher Attitude towards Teaching.

3.3 Graded Response Model

Since the items in the test are of the polytomous ordered-response type, the Graded Response Model was chosen. The model estimates discrimination (a) and category threshold parameters (b) for each item. The discrimination parameters tell how well the item discriminates between the different levels of the latent trait, while the threshold parameters tell where along the continuum of the latent trait the respondents are more likely to agree with the higher response categories. Two types of GRM specifications were explored: constrained and unconstrained. For the constrained model, the discrimination parameter was fixed for all the items, and in the unconstrained model, each item was given a separate discrimination parameter. A comparison of the two specifications was then made using likelihood-ratio testing.

3.4 Item Screening and Scale Refinement

There were two stages in the analysis. All 15 items were first entered into the unconstrained GRM for a review of item discrimination issues. The items with relatively low discriminating power were deleted: I1, I4, I7, and I13. The resulting 11-item instrument retained I2, I3, I5, I6, I8, I9, I10, I11, I12, I14, and I15. Second, 11 items were retained and both constrained and unconstrained GRM models were fit. The model comparison was employed to see if it was possible to get a significantly better model fit by allowing item-specific discrimination parameters.

3.5 Item and Scale Level Information

The last GRM provided item response category characteristic curves that were analyzed to assess the probability of endorsing each response category throughout the range of the latent trait. To find the trait ranges that showed greater measurement precision, Item Information Curves (IICs) were analyzed. The Test Information Function (TIF) was investigated to explore the overall information and measurement precision of the full 11 item scale at various levels of Teacher Attitude Towards Teaching.

3.6 Reliability Analysis

The TAT items were ordinal Likert-type responses, so the reliability was assessed based on ordinal alpha, which is calculated with a poly-choric correlation matrix. The omega was also computed as a complementary measure of internal consistency for the McDonald's. These were used as indications of the internal consistency of the final scale.

4. RESULT AND ANALYSIS

4.1 Initial 15 Item GRM Analysis

The first unconstrained GRM was fitted on all 15 items. The estimation of the discrimination parameters was between 0.082 and 1.901. Items I7 ($a = 0.082$), I13 ($a = 0.234$), I1 ($a = 0.300$), and I4 ($a = 0.323$) showed the weakest discrimination and were therefore removed during item refinement. In contrast, items such as I10 ($a = 1.901$), I9 ($a = 1.270$), I15 ($a = 1.220$), and I6 ($a = 1.131$) demonstrated comparatively stronger discrimination.

Item	Initial discrimination (a)
I1	.300
I2	.474
I3	.398
I4	.323
I5	.890
I6	1.131
I7	.082
I8	.618

I9	1.270
I10	1.901
I11	.384
I12	.778
I13	.234
I14	.962
I15	1.220

*Table 1. Discrimination parameters from the initial 15-item unconstrained GRM.***4.2 Final 11 Item GRM Analysis**

The final analysis is based on 11 items after the removal of I1, I4, I7 and I13. The mean item discrimination for the unconstrained GRM was about 0.907 and ranged from 0.356 to 1.999. The strongest discrimination was observed for I10 ($a = 1.999$), followed by I9 ($a = 1.379$), I15 ($a = 1.191$), I6 ($a = 1.080$), and I14 ($a = 0.991$). The lowest discrimination for the retained items was I3 ($a = 0.356$) and I11 ($a = 0.380$), but these items were kept in the final instrument.

Item	b1	b2	b3	b4	A
I2	-11.164	-8.745	-7.603	1.174	.459
I3	-14.289	-5.820	-4.750	3.463	.356
I5	-6.495	-4.254	-3.570	.522	.822
I6	-5.104	-3.115	-2.996	.756	1.080
I8	-9.294	-5.466	-4.524	1.521	.556
I9	-2.518	-1.225	-.965	1.751	1.379
I10	-3.329	-1.410	-1.242	1.036	1.999
I11	-5.136	.198	.766	6.601	.380
I12	-5.038	-1.873	-1.380	2.812	.765
I14	-3.496	-1.038	-.895	2.751	.991
I15	-3.178	-1.399	-1.183	1.482	1.191

Table 2. Parameter estimates for the final 11-item unconstrained GRM.

The retained items did not all have the same threshold estimates, suggesting that these items covered various parts of the latent continuum of Teacher Attitude towards Teaching. The parameters of discrimination for the items further suggest that there was not the same degree of effectiveness in discriminating between respondents across the items, lending credence to the use of the unconstrained specification.

4.3 Comparison of Constrained and Unconstrained Grm

(This section provides a comparison of constrained and unconstrained GRM.). The constrained GRM estimated a common discrimination parameter of 0.846 for the 11 items retained and yielded a log-likelihood of -1740.482, AIC = 3570.96, and BIC = 3707.33. The unconstrained GRM produced a higher log-likelihood of -1726.22, AIC = 3562.44, and BIC = 3729.12. The likelihood-ratio test showed that the model fit for the unconstrained specification was significantly superior $LRT(10) = 28.52$, $p = .001$. Thus, the unconstrained GRM was kept as the final model.

Model	Log-Likelihood	AIC	BIC
Constrained GRM	-1740.48	3570.96	3707.33
Unconstrained GRM	-1726.22	3562.44	3729.12

Table 3. Comparison of constrained and unconstrained GRM specifications.

Likelihood-ratio test: LRT = 28.52, df = 10, p = .001.

4.4 Item Response Category Curve

The item response category of all the items is shown below. The category characteristic curves show the likelihood of choosing each of the 5 response categories along the continuum of teacher attitudes toward teaching. The curves illustrate the nature of the responses at different levels of the trait. The last set of numbers below is for only the 11 items that are retained.

Item Response Category Characteristic Curves – Item: I2

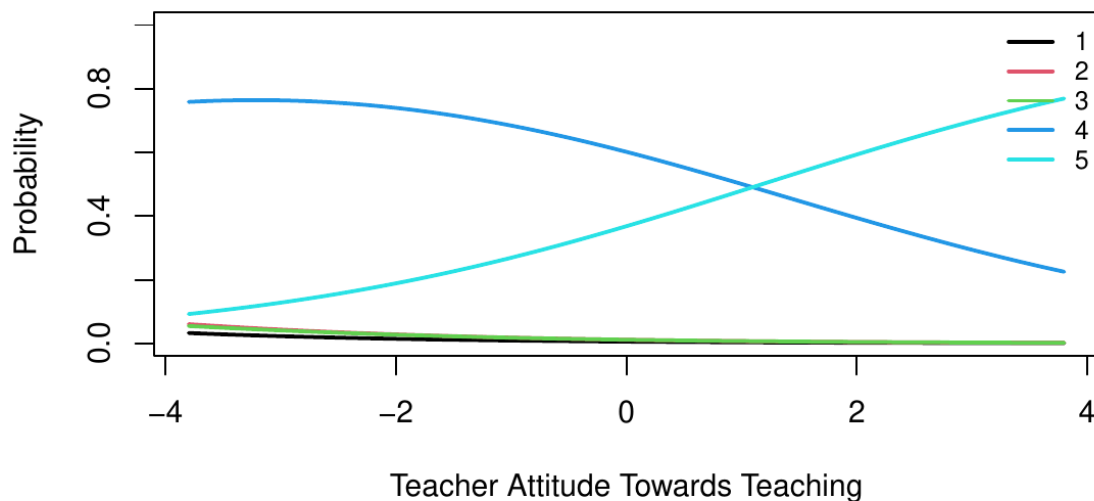


Figure 1. Item response category characteristic curves for I2.

Item Response Category Characteristic Curves – Item: I3

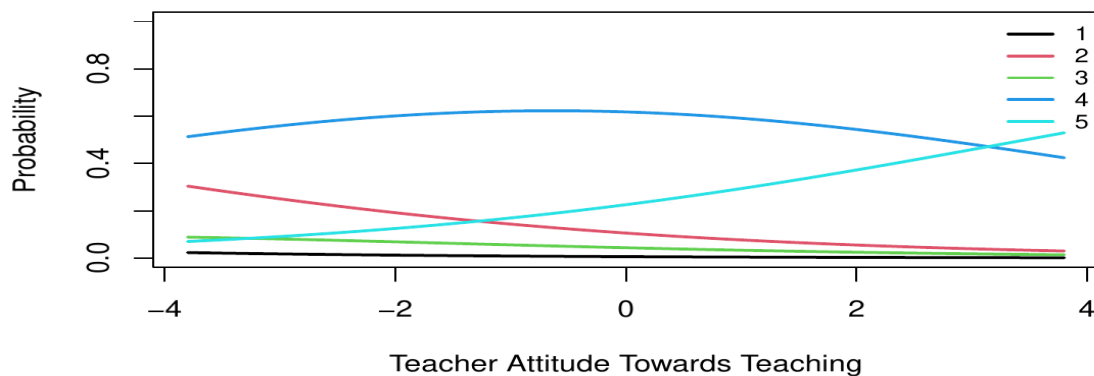
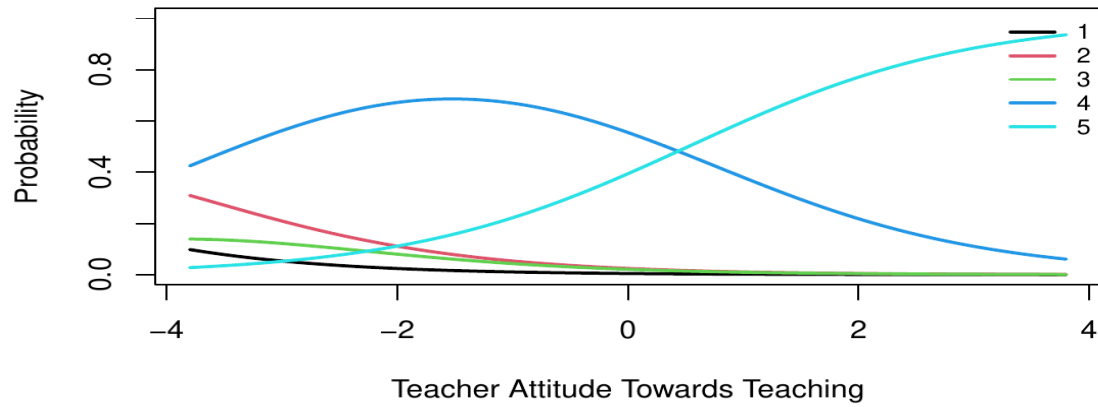
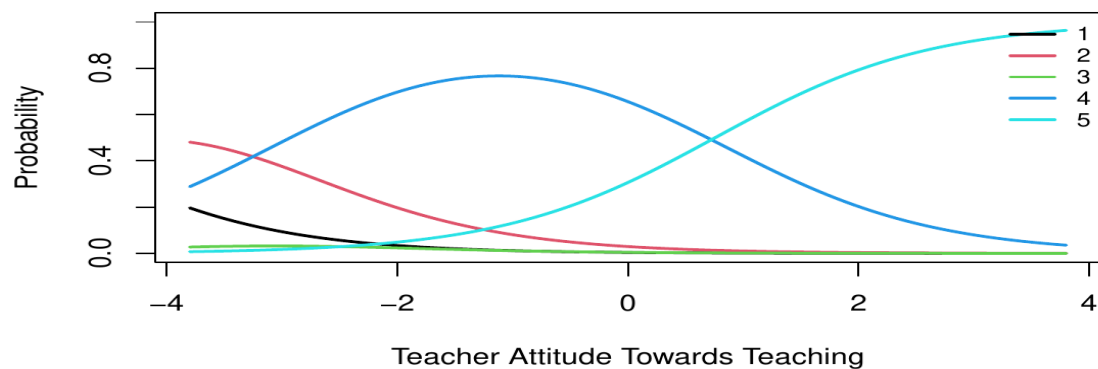
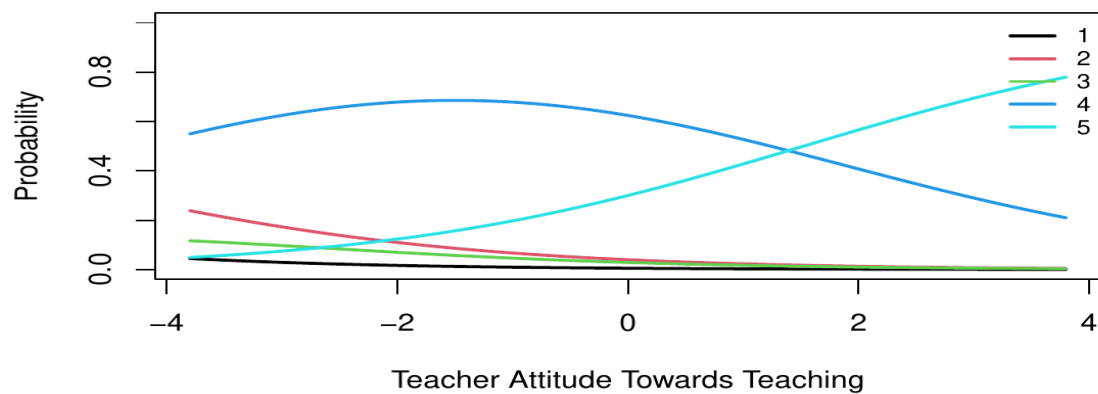
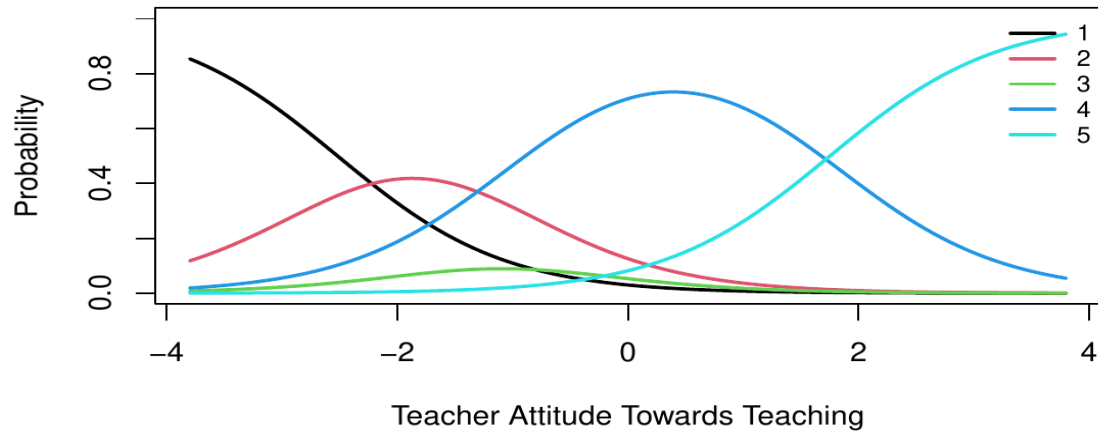
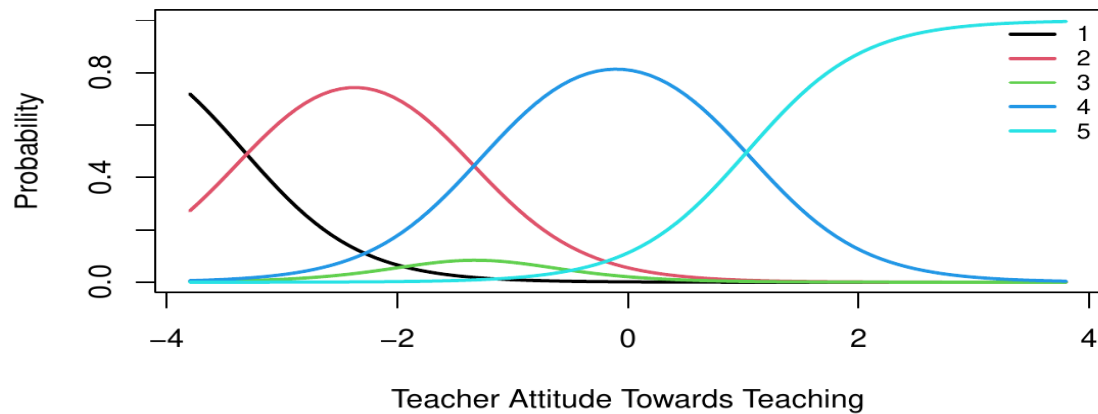


Figure 2. Item response category characteristic curves for I3.

Item Response Category Characteristic Curves – Item: I5**Figure 3. Item response category characteristic curves for I5.****Item Response Category Characteristic Curves – Item: I6****Figure 4. Item response category characteristic curves for I6.****Item Response Category Characteristic Curves – Item: I8****Figure 5. Item response category characteristic curves for I8.**

Item Response Category Characteristic Curves – Item: I9**Figure 6. Item response category characteristic curves for I9.****Item Response Category Characteristic Curves – Item: I10****Figure 7. Item response category characteristic curves for I10.**

Item Response Category Characteristic Curves – Item: I11

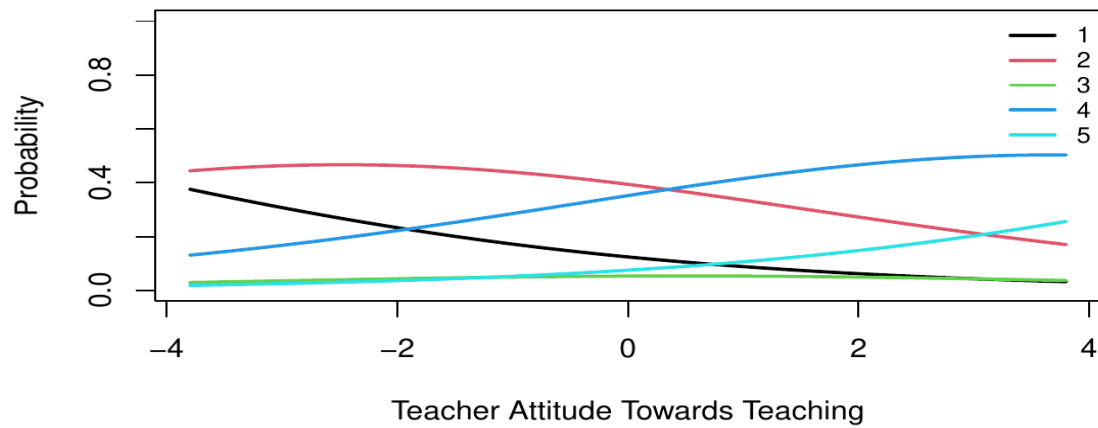


Figure 8. Item response category characteristic curves for I11.

Item Response Category Characteristic Curves – Item: I12

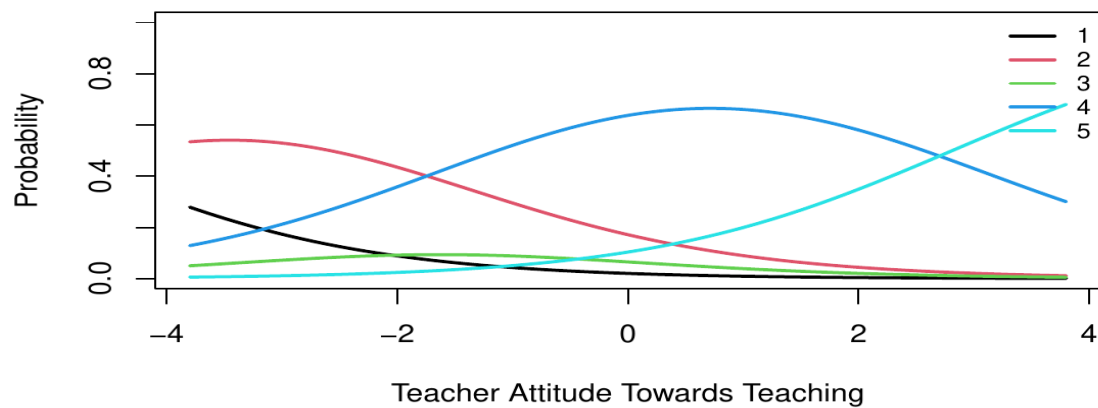


Figure 9. Item response category characteristic curves for I12.

Item Response Category Characteristic Curves – Item: I14

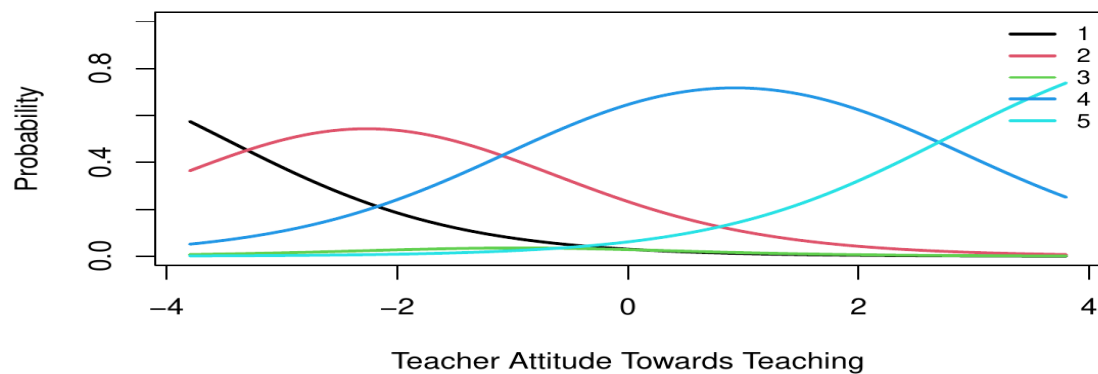


Figure 10. Item response category characteristic curves for I14.

Item Response Category Characteristic Curves – Item: I15

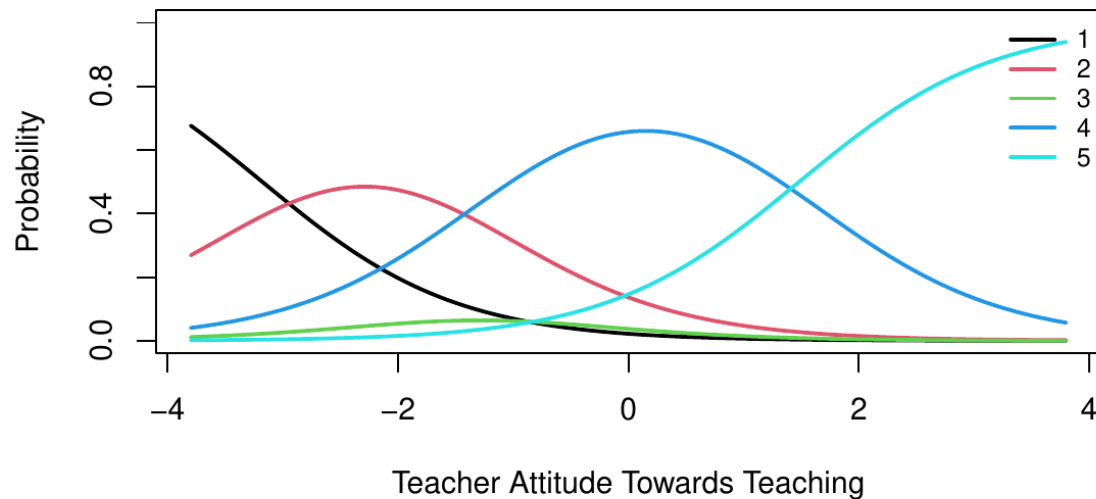


Figure 11. Item response category characteristic curves for I15.

4.5 Item Information Curve

The Item Information Curves display the information each retained item provides on the continuum of the latent trait. A more precise measurement in the respective part of the trait is obtained with items having higher peaks. The IICs show that the retained items provide information in different places and thus different measurement coverage.

Item Information Curves

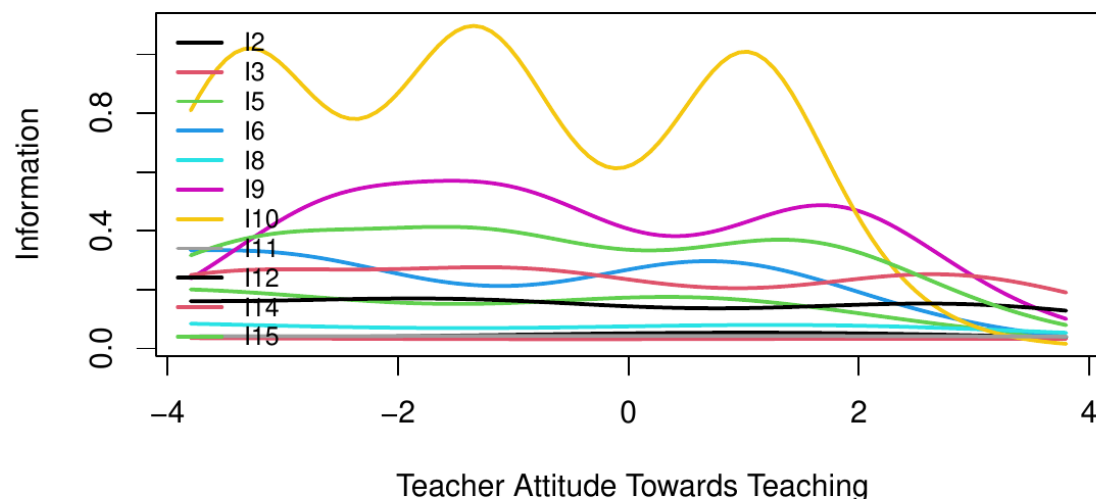


Figure 12. Item Information Curves for the final 11-item TAT instrument.

4.6 Test Information Curve

The TIF shows the information for the measurement of the 11-item scale over the continuum of the latent trait. The curve indicates that the test is stronger on the lower/upper and middle portion of the Teacher Attitude towards teaching continuum, with information dropping off at the upper extreme. Therefore, the scale will be most precise in the trait areas with the highest TIF.

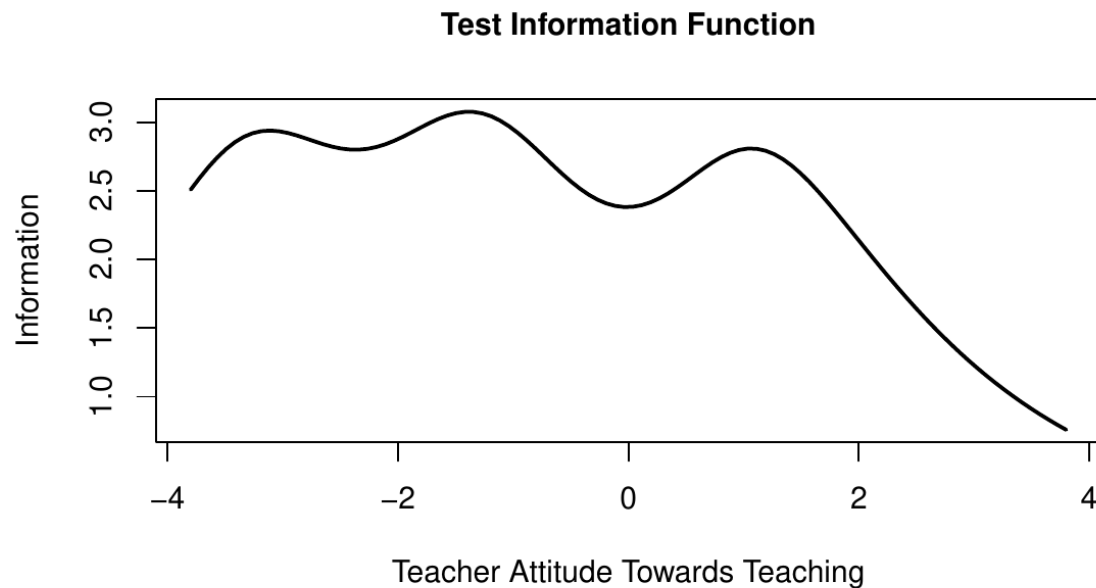


Figure 13. Test Information Function for the final 11-item TAT instrument.

4.7 RELIABILITY

The ordinal alpha value for the last 11 items scale was 0.689 and for McDonald's omega total it was 0.690. The internal consistency of these co-efficient is moderate. The values are near, but slightly lower than the typical 0.70 standard, and might be sufficient for the current exploratory/initial validation phase.

Reliability coefficient	Estimate
Ordinal alpha	0.689
McDonald's omega total	0.690

Table 4. Internal consistency estimates for the final 11-item scale.

5. DISCUSSION

5.1 Model Selection

The likelihood-ratio comparison supported the unconstrained GRM as compared to the constrained GRM. The large value of the LRT in conjunction with the lower AIC value for the unconstrained model suggests that the assumption of a common discrimination parameter was not a good choice to represent the differences among items on the data. The final unconstrained GRM is thus a more appropriate representation of the retained TAT items.

5.2 Item Information and Measurement Precision

Individual items provide information in different areas of the latent continuum as reflected by the IICs. Important because items are allowed to have acceptable discrimination, but unequal precision over levels of the trait. The TIF offers the scale level perspective and suggests that the final 11-item instrument is more informative at the mid to low range of the Teacher Attitude towards Teaching continuum than it is at the high range.

5.3 Reliability

The ordinal alpha and omega estimates were 0.689 and 0.690 respectively. These values are indicative of moderate internal consistency and are close to the conventional .70 criterion. The present analysis was designed for initial psychometric validation of IRT, so the coefficients offer supportive evidence, but cannot be used to conclude full instrument validity. This study was limited to an evaluation of a single school district. This was a single district study. The present analysis is item-level evidence based on the GRM however psychometric validation is an accumulated process. Additional evidence of construct, convergent, discriminant, or criterion-related validity, along with dimensionality/un-dimensionality and local independence, category functioning, and threshold ordering should be explored further in order to validate the instrument. In addition, future studies with larger and independent samples could yield more evidence of the stability and generalisability of the item parameters.

6 Summary

A GRM approach based on IRT was used to reduce the items in the TAT instrument from 15 to 11. Items I1, I4, I7 and I13 were eliminated due to poor discrimination in the preliminary analysis. The final unconstrained GRM significantly outperformed the constrained model ($LRT(10) = 28.52, p = .001$). The discrimination value of the items retained ranged from 0.356 to 1.999, and the ordinal alpha and omega for the final scale were 0.689 and 0.690, respectively. In general, the results offer initial psychometric evidence for the use of the shortened 11-item TAT instrument, and suggest that additional research is warranted to further validate this instrument with larger and independent sample.

REFERENCES

- 1) Bunting, C. E. (1981). The development and validation of the Educational Attitudes Inventory. Educational and Psychological Measurement, 41(2).
<https://doi.org/10.1177/001316448104100239>
- 2) Ashton, P. (1985). Motivation and the teacher's sense of efficacy. In C. Ames & R. Ames (Eds.), Research on Motivation in Education: The Classroom Melieu, Academic Press.
- 3) Kubany, H. (Ed.). (1990). Designing error choice techniques for effective measurement in surveys. John Wiley & Sons.
- 4) Kagitcibasi, B. (1999). Emotional intelligence and attitude as determinants of personality. Journal of Personality Assessment, 44(2), 227-239.
- 5) Ostini, R., & Nering, M. L. (2006). Polytomous Item Response Theory Models. Sage Publications.
- 6) Rizopoulos, D. (2006). ltm: An R package for latent variable modelling and item response theory analyses. Journal of Statistical Software, 17(5):1-25.
- 7) Samejima, F. (1969). Estimation of latent ability using a response pattern of graded scores. Psychometrika Monograph Supplement, 17(4).
- 8) Samejima, F. (1997). Graded response model. In W. J. van der Linden & R. K. Hambleton (Eds.), Handbook of Modern Item Response Theory (pp. 85-100). Springer.
- 9) Sangwan, A., Sangwan, A., & Punia, P. (2021). The creation and testing of an attitude scale to online teaching and learning for Higher Education teachers. Tech Trends, 65, 187-195.
<https://doi.org/10.1007/s11528-020-00561-w>
- 10) Guskey, M. (2002). The attitude towards teaching profession of pre-service and in-service primary school teachers and its effect in student achievement. Pedagogika, 2(1), 61-65.
- 11) Hafsath, A. M. (2003). The effect of certain selected variables in the development of attitude towards teaching of primary school teachers [Unpublished master's thesis]. University of Calicut, Master of Education.
- 12) Olivares, A. M. (2005). Nonparametric IRT. Encyclopaedia of Statistics in Behavioural Science.
- 13) Ostini, R., & Nering, M. L. (2006). Polytomous Item Response Theory Models. Sage Publications.
- 14) Rizopoulos, D. (2006). ltm: An R package for latent variable modelling and item response theory analyses. Journal of Statistical Software, 17(5):1-25.
- 15) Ma, J. A., & Kishore, S. (2007). The motivational properties of teaching attitude in the learner achievement. Colombian Applied Linguistic Journal, 13(2), 43-57.
- 16) DeMars, C. (2010). Item Response Theory. Oxford University Press.
- 17) Tarkin, M., & Uzuntiryaki, C. (2012). Emotional geographies of teaching. Teachers College Record, 103(6), 1056-1080.
- 18) Parvez, M., & Shakir, M. (2013). Attitude of prospective teachers towards teaching profession. Journal of Education and Practice, 4(10), 172-178.
- 19) Ayik, A., & Atas, O. (2014). The relationship between pre-service teachers' attitudes towards the teaching profession and their motivation to teach. Journal of educational sciences Research, 4(1), 25-43.
- 20) Chakraborty, A., & Mondal, B. C. (2014). Attitude of prospective teachers towards teaching profession. American Journal of Social Sciences, 2(6), 120-125.
- 21) Bhaskara, C.L. (2014) : The comparative demographic study of attitudes of secondary and higher secondary student-teachers towards teaching profession. International Journal of Informative & Futuristic Research. 2(2), 432-438.
- 22) Bhargava, K., & Pathy, S. (2014). Influence of socio-cultural environment in the development of teaching attitude. Asian Journal of Psychology and Education, 16 (3), 122-141.
- 23) Cinpolat, A. J. (2015). The perception of teaching as a profession by Turkish trainee teachers: Attitude towards being a teacher. International Journal of Humanities and Social Science, 1 (4), 83-87.

- 24) Arumugan, G. & Prabakar, P. (2015) : A Study on attitude towards teaching profession of B.Ed. students in relation to self-esteem. *Indian Journal of Applied Research*, 5(1), 149-151
- 25) Alincak, J. S. (2016). Teaching efficacy: Age, experience and attitude as determining factors. *Teaching and Teacher Education*, 17(6), 783-796.
- 26) Cetin, R. S. (2016). A quantitative analysis of the relationship between classroom management, proficiency of language and attitude towards teaching among primary school teachers. *Asian Journal of Psychology and Education*, 13(4), 54-58.
- 27) Bilgin, H. L., & Aykac, M. (2016). Effect of learning theories in developing teaching attitudes among prospective teachers. *Procedia -Social and Behavioural Sciences*, 15 (4), 324-349.
- 28) Sharma, N. (2016) : Attitude of pupil teachers towards teaching profession in relation to gender and background. *Indian Journal of Applied Research*, 6(2), 345-347
- 29) Sao, P. M., & Behrara, A. S. (2016). Defining attitude for science educators in relation to their self-image. *Journal of Research in Science Teaching*, 25(1), 659-678.
- 30) Rani, R. (2016) : Attitude towards teaching profession of prospective teachers in relation to certain demographic variables. *Bharitiyam International Journal of Education and Research*, 6(1), 7-15.
- 31) Nalcaci, S., & Sokmen, L. (2016). Investigating reasons for choosing teaching as a profession. *Pamukkale University Journal of Education*, 5(2), 1-9.
- 32) Korur, F., Vargas, R., & Serrano, N. T. (2016). Attitude toward Science teaching of Spanish and Turkish in-service elementary teachers: Multi-group confirmatory factor analysis. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(2), 303-320.
- 33) Hancer, P. M. (2017). An examination on the attitude towards teaching profession in relation to gender and academic excellence of prospective teachers. *e-Journal of New World Sciences Academy*, 5(2), 367-358.
- 34) Perez-Rodriguez, U., Varela-Losada, M., AlvarezLires, F. J., & Vega-Marcote, P. (2017). Attitudes of pre-service teachers: Design and validation of an attitude scale toward environmental education. *Journal of Cleaner Production*, 164, 634-641.
- 35) Banerjee, S. (2019) : Attitude of pupil-teachers towards teaching profession in relation to sex and academic qualification variation. *International Journal of Innovative Research and Development*, 5(1), 65-67.
- 36) Deswal, Y. (2020) : A study of Attitude of pupil teachers towards teaching profession. *Bharitiyam International Journal of Education and Research*, 6(3), 23-29.
- 37) Olakunle, A. M., & Salman, A. A. (2020). Teachers' attitude towards teaching and students' performance in English grammar in osogbo metropolis, Osun state, Nigeria. *European Journal of Foreign Language Teaching*, 5(1), 1-10
- 38) Olatunde-Ajyedun, T. G. (2021). Student teachers' attitude towards teaching practice. *International Journal of Culture and Modernity*, 8, 6-17.
- 39) Ahmad, S., Sultana, N., & Jamil, S. (2021). The reliability and validity study of the scale measuring high school Students' attitude towards biology: Using factor analysis. *Journal of Reliability and Statistical studies*, 14(1), 285-310.
- 40) Kara, A., & Ada, K. (2021). The relation between attitudes toward the teaching profession, occupational resilience belief, and extra-role behavior: A moderated mediation model. *Journal of Pedagogical Research*, 5(3), 105- 121.
- 41) Goswami, S. (2021). Attitude of teachers towards teaching at the elementary level. *Journal of Research in Humanities and Social Science*, 9(6), 43-47.
- 42) Gafoor, K. A., & Suma, A. (2022). Construction and validation of Scale of Attitude towards Teaching (SAT). *International Journal of Innovations & Research Analysis*, 2(4I), 6-18.
- 43) Jeevanantham, V., & Muthuchamy, I. (2022). Construction and validation of attitude towards teaching scale (ATTS). *International Journal of Health Sciences*, 6(S5), 2309-2315. <https://doi.org/10.53730/ijhs.v6nS5.9144> .
- 44) Chauhan, P. S., & Sharma, P. (2022). Development and validation of teacher's attitude scale towards information and communication technology (ICT) at senior secondary level. *International Journal of Creative Research Thoughts*, 10(6), 401-408.
- 45) Polat, H. (2022). Investigating the relationships between preservice teachers' teacher readiness, attitude towards teaching professions, and organizational attraction through structural equation modeling. *Educational Process: International Journal*, 11(3), 62-86.

- 46) Duzgun, G., & Kirkic, K. A. (2023). A developmental study of the Attitude Scale towards Teaching Arabic Language (ASTTAL): Reliability and validity analysis. International Journal of Psychology and educational Studies, 10(2), 406-422
- 47) Chaudhuri, P. D., Ray, S., & Sikdar, D. P. (2023). Caregivers' knowledge and attitude scale towards durg: Development and validation. International Journal of Research in Medical Sciences, 11(9), 3316-3124.