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Instructional Preference Scale: Measuring Andragogical Instructional Preference of Prospective Teachers

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ABSTRACT

The instructional design for prospective teachers frequently reflects pedagogical assumptions about learner, offering limited acknowledgment of the andragogical principles that emphasize adult learners' self-direction and experiential engagement. The paper aims to construct and validate a reliable scale measuring prospective teachers' andragogical instructional preferences. An initial item pool derived from andragogical principles (Knowles, SDL theory, adult learning literature) was reviewed by experts in teacher education. Initially the scale consists of 120-items under 5-dimensions such as "Responsiveness to Learner Needs", "Autonomy and Self-Direction in Learning", "Experiential and Problem-Centered Learning", "Self-Assessment and Reflective Practice" and "Interactive and Motivational Learning Orientation". The scale was administered to 418 prospective teachers of teacher education institutes from Rajasthan and Delhi. Among 418 respondents, 387 appropriately filled questionnaire were analyzed. Then, item analysis was conducted using SPSS version 25.0. EFA were used to establish dimensionality, reliability, and validity. Along with this, item total correlation of the scale was tested and discussed. After item analysis, 35-items are retained in the final draft and the Cronbach's alpha value of the final tool is found to be 0.74, which shows that the scale is reliable to assess prospective teachers' instructional preference.

Keywords: Instructional Preference Scale (IPS); Andragogy; Prospective Teacher; Instructional Approach; Pre-service Teacher Education; Learners Agency; Self-assessment; Learning Orientation; Learners Need; Self-directed Learning.

1. Introduction

Instructional perspectives in teacher education must evolve beyond a limited pedagogical stance toward a more inclusive instruction that recognizes and integrates andragogical principles reflective of contemporary teaching and learning contexts. A perspective that prospective teachers are not *'novices'* in the purest sense is imperative, since they bring academic experiences, prior knowledge, and a readiness to apply learning in professional contexts. The idea of describing the target learner of andragogical method is categorically "Adult learner" is decades old and with given context of today's evolved technology and ubiquitous learning, in teacher education, andragogy holds a reasonable potential to create certain impact through its focus on individual learning and learner agency.

Applying andragogical principles such as self-direction, experiential learning, and problem-centered inquiry cultivates reflective practice and professional autonomy, such competencies are essential for effective teaching. The contemporary learning landscape signals a paradigm shift from pedagogical control towards embracing learner agency, calling for the integration of andragogical principles that empower learners to navigate, evaluate, and construct knowledge within AI-mediated environments and participate in self-development (OECD 2020; International Commission on the Futures of Education, 2021).

An andragogical approach complements the effective learning in teacher education context by extending the developmental continuum of learning (Pedagogy→Andragogy→Heutagogy continuum), preparing teacher candidates to think and act as independent professionals. Studies conducted within different professional learning programs show that andragogical design enhances engagement, critical reflection, and long-term retention among adult learners, thereby strengthening the quality of teacher preparation (Knowles, 1984; Livingston, 2023; Knapke

et al., 2024). When teacher education models adult-learning principles in its own processes, it not only respects the maturity of its learners but also demonstrates the kind of facilitative, learner-centered teaching that these future educators are expected to embody in their classrooms (Holmes, 2000; Sandlin, 2005; Ajani, 2023).

Andragogy, defined as the art and science of helping adults learn, has significant relevance in pre-service teacher training programs. This instructional approach recognizes the distinct needs of adult learners, providing a framework that caters to their unique motivations and experiences. The key principles of andragogy, outlined by Malcolm Knowles, indicate that adult learners are self-directed, bring a wealth of experience to the learning environment, and require learning that is applicable to their current and future roles (Cooke, 2010; Adarkwah, 2024; Mukhalalati & Taylor, 2019; Teane, 2024). The application of andragogical principles can enhance the quality of pre-service teacher education by promoting active engagement, fostering critical reflection, and streamlining the integration of theoretical knowledge with practical application (McCauley, Hammer, & Hinojosa, 2017).

Andragogy as an instructional framework in teacher education holds substantial promise for catalyzing a systemic shift through a top-down reform, toward learner-centered transformation. The Pedagogy–Andragogy–Heutagogy continuum describes how learners evolve from relying on teacher guidance to taking full ownership of their learning. In the pedagogical stage, learning is teacher-driven: the teacher decides what will be taught, how it will be delivered, and when. Learners depend on that structure to build their basic understanding. As learning shifts to andragogy, it becomes more of a partnership. Teachers guide rather than direct, helping learners recognize their own needs, set goals, and draw from prior experiences to tackle real-world problems. Motivation here is mostly internal (Knowles, Holton, & Swanson, 2015; Rathner, & Schier, 2020). At the heutagogical stage, learners take complete charge of both the process and content of their learning. Educators act as mentors or co-learners, encouraging reflection, exploration, and the development of deeper capabilities (Blaschke, 2012; Hase & Kenyon, 2000).

Seen as a developmental journey, this continuum traces the movement from dependence toward autonomy and interdependence in professional growth. In teacher education, it suggests that pre-service programs should help future teachers make that shift from structured learners to reflective practitioners capable of designing and facilitating learner-centered experiences. Guiding them through this progression strengthens lifelong learning habits and equips them to cultivate autonomy, curiosity, and problem-solving in their own classrooms (Canning, 2010; Blaschke, 2012). But in context of pre-service teacher education utilizing andragogical instructional approach bridges the P-A-H spectrum from teacher centred instructional approach to a learner determined learning approach via facilitated self-directed learning and empowering learner agency.

As Gravani (2012) emphasizes, “educators should consider incorporating adult learning principles into professional development for teachers to enhance learning” (p. 426). This view reinforces the idea that andragogical principles can be effectively extended to pre-service teacher education to nurture agency, reflective capacity, and professional autonomy. When future teachers experience these approaches during their own training, they are more likely to replicate learner-centered, participatory practices in their classrooms, thereby contributing to the broader transformation of education envisioned by recent policy and pedagogical reforms.

1.1. Conceptualizing Instructional Preference

Despite sustained policy reforms in India aimed at moving classrooms away from rote memorization and toward learner-centered education, research indicates that pre-service teacher education continues to rely heavily on traditional, teacher-centered approaches (Bremner et al., 2024; Singh & Yaduvanshi, 2015). This orientation, often characterized as performance pedagogy, casts the teacher as the primary transmitter of knowledge and learners as passive recipients (Mandal, 2022; Tabulawa, 2006). Such a pedagogical stance restricts opportunities for learner agency, which can be understood as the sense of ownership, voice, and control learners experience in their education (Oxford University Press; Demchenko, Gruengard & Klous, 2014). In the "sage on the stage" model, students are seldom encouraged to direct their own learning, raise questions, or engage in active exploration (Prakasha et al., 2020; Tabulawa, 2006). The absence of agency during their preparation years is particularly concerning for prospective teachers, as it can limit the development of a robust professional identity. Professional identity formation, the integration of personal and professional selves into a coherent sense of being a teacher is a key developmental task during pre-service education (Beijaard et al., 2004). When prospective teachers are socialized into systems that emphasize compliance over autonomy, they may experience what has been termed an "identity crisis," marked by uncertainty about their role, capacity, and professional purpose (Kumar & Kumar, 2024).

Developing strong professional roles and identities is a fundamental objective of teacher education. However, this goal requires a parallel focus on the instructional preferences of prospective teachers themselves. Do they demonstrate a predisposition toward teacher-centered instruction due to their own experiences as learners? How do they perceive instructional autonomy, experiential learning, and reflective practices within their training environments? Addressing these questions is essential for designing effective programs that nurture teacher agency and professional identity.

The instructional preference scale serves as a measuring tool to assess the learners andragogical learning attributes. It is most important to mention that the reviews confirmed that at present, no validated instrument specifically captures the andragogical instructional preferences of prospective teachers in the Indian teacher education context. To address this gap, the present study seeks to construct and validate a scale that assesses prospective teachers' orientation toward andragogical principles such as autonomy, experiential learning, reflection, and motivation. Such a tool will allow researchers and teacher educators to systematically measure instructional preferences, identify areas of resistance to learner-centered practices, and design interventions that align with the broader aims of teacher education reform.

1.2. Existing Measures and Gaps

Several instruments have been developed internationally to assess orientations toward adult learning and instructional practices from different perspectives, but none adequately capture the multidimensional construct of andragogical instructional preference in the context of teacher education. One of the earliest and most widely used measures, the Principles of Adult Learning Scale (PALS), was designed to assess alignment with adult-learning principles among educators (Conti, 1983). PALS provides a useful starting point, with items reflecting

collaboration, personalization, and learner involvement, and has demonstrated reliability in diverse settings (Premont, 1989). However, the scale was primarily developed for general adult educators rather than for prospective teachers in professional preparation programs, and it does not sufficiently address constructs such as reflective assessment, experiential learning, or motivational orientation.

The Teaching Perspectives Inventory (TPI) offers another valuable framework, capturing five broad perspectives on teaching (Transmission, Apprenticeship, Developmental, Nurturing, and Social Reform) (Pratt & Collins, 2000; Collins & Pratt, 2011). While the TPI is widely validated and widely used across higher education, its emphasis is on overall teaching philosophy rather than on preferences tied directly to andragogical principles such as learner autonomy or problem-centered learning. Other measures, such as self-directed learning readiness scales (SDLRS), target learners' autonomy and readiness for self-regulated learning (Guglielmino, 1977; Fisher, King, & Tague, 2001). While relevant to the principle of self-concept, these scales focus on learners' dispositions rather than on instructional preferences of teachers-in-training. As such, they are limited in their applicability to pre-service teacher education, where the issue is not only learners' readiness but also the instructional orientations that prospective teachers internalize during their professional formation.

In India, despite ongoing policy emphasis on learner-centered reforms, very few empirical attempts have been made to operationalize andragogical principles within teacher-education research. Existing assessments often rely on adapted tools with limited cultural validation or focus primarily on pedagogical effectiveness rather than on prospective teachers' instructional orientations.

Thus, the existing tools reveal three critical gaps:

- They do not comprehensively operationalize all six of Knowles' principles of andragogy into instructional-preference dimensions.
- They are not designed for, nor widely validated in, pre-service teacher education contexts, particularly within India.
- They emphasize broad teaching philosophies or learner traits, rather than the specific andragogical instructional preferences shaping teacher professional identity.

Thus, the above-mentioned gaps underscore the need for a contextually grounded instrument, the Instructional Preference Scale, to systematically assess prospective teachers' orientations toward learner-centered, andragogy-based practices. By focusing on exploratory factor analysis and reliability/validity checks, the present study aims to provide an empirically grounded tool for teacher education research and practice.

1.3. Aims and Objectives of Instructional Preference Scale

The Instructional Preference Scale is designed to assess the instructional preference of prospective teachers, with a focus on the extent to which their preferences align with the andragogical principles of teaching and learning. The specific objectives of the present study are to:

- Develop and standardize the Instructional Preference Scale (IPS) grounded in the core principles of andragogy.

- Assess the degree to which prospective teachers' instructional preferences reflect andragogical orientations such as learner autonomy, experience-based learning, and intrinsic motivation.
- Examine prospective teachers' responsiveness to learner needs and their inclination toward flexible, learner-centered instructional methods.
- Evaluate their orientation toward reflective, self-assessing, and collaborative approaches to teaching and learning.
- Identify dominant instructional preference patterns among prospective teachers to understand their readiness for adopting learner-centered and andragogical practices in future classrooms.

2. Scale Development

The initial item generation for Instructional Preference Scale was derived from Knowles' six principles of andragogy, which emphasize adult learners' autonomy, experiential orientation, readiness, and intrinsic motivation (Knowles, Holton, & Swanson, 2015). Guided by these principles and a review of literature on teacher education, five core dimensions were identified to reflect the instructional preferences of prospective teachers. These dimensions integrate andragogical assumptions into the context of pre-service teacher education, where the alignment of instructional beliefs with adult-learning principles is critical for developing future teachers' professional identity and teaching competence.

2.1. Definition of the Dimensions

Responsiveness to Learner Needs: This construct integrates the principles of orientation to learning and readiness to learn. It reflects the extent to which instruction adapts to learners' needs, interests, and developmental contexts. In teacher education, this responsiveness encourages prospective teachers to value learner-centered strategies and situational flexibility in classroom practice (Henschke, 2011).

Autonomy and Self-Direction in Learning: Anchored in the principle of self-concept, this dimension emphasizes learner autonomy in goal setting, planning, and managing the learning process. Within teacher education, this construct aligns with developing reflective practitioners who can manage their professional growth through self-initiated learning and decision-making (Mentz, 2020).

Experiential and Problem-Centered Learning: Drawing on the principles of prior experience and orientation to learning, this construct captures preferences for real-world problem-solving, practical application, and the use of learners' backgrounds as a resource for learning. Experiential learning supports prospective teachers in bridging theory and practice, allowing them to analyze teaching situations, reflect on outcomes, and refine instructional decisions (Kolb, 2015).

Self-Assessment and Reflective Practice: Linked to the principles of self-concept and motivation to learn, this dimension highlights the role of reflection, self-evaluation, and peer assessment in fostering growth. In pre-service education, reflective practice enables prospective teachers to critically examine their progress, recognize areas for improvement, and develop professional agency. For prospective teachers, this dimension reinforces the

andragogical view that learning is an iterative, self-evaluative process essential for adaptive teaching and lifelong professional development (Mezirow, 2009).

Interactive and Motivational Learning Orientation: Combining the principles of motivation and experience, this construct represents preferences for collaborative learning, active participation, and intrinsic motivation. Andragogy underscores collaboration, dialogue, and intrinsic motivation as core to adult learning (Henschke, 2011). For prospective teachers, valuing interaction and internal motivation supports the creation of engaging learning environments that extend beyond formal, lecture-centered traditions.

Together, these five dimensions formed the conceptual basis for the initial item pool. Items were written as declarative statements on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with both positively and negatively worded statements to minimize acquiescence bias.

2.2. Item Generation

The first draft of the tool was prepared, initially the tool had 120 number of items. In which sub-dimension Responsiveness to Learner Needs (RLN) is having 26-items, sub-dimension Autonomy and Self-Direction in Learning (ASL) is having 21-items, sub-dimension Experiential and Problem-Centered Learning (EPL) is having 24-items, sub-dimension Self-Assessment and Reflective Practice (SRP) 24-items, and sub-dimension Interactive and Motivational Learning Orientation (IML) 25-items. The dimension-wise no. of items has been shown below in the Table 1.

Table 1. Dimension wise no. of items 1st draft

S. No.	Dimensions	No. of items
1	Responsiveness to Learner Needs (RLN)	26
2	Autonomy and Self-Direction in Learning (ASL)	21
3	Experiential and Problem-Centered Learning (EPL)	24
4	Self-Assessment and Reflective Practice (SRP)	24
5	Interactive and Motivational Learning Orientation (IML)	25
Total no. of Items		**120**

After formulation of 1st draft the tool was evaluated by the experts, an initial tryout was also conducted with 36 M.Ed. 1st year students at teacher education institutions situated in Ajmer. Based on the observed response pattern of respondents, 62 items were removed and reframed to enhance accuracy. After initial tryout, the 2nd draft was prepared for the tool standardization and final validation. The 2nd draft of IPS consisted of 58 no. of items as shown below in the Table 2.

Table 2. Dimension wise no. of Items in 2nd Draft

S. No.	Dimensions	No. of items
1	Responsiveness to Learner Needs (RLN)	13
2	Autonomy and Self-Direction in Learning (ASL)	12
3	Experiential and Problem-Centered Learning (EPL)	12
4	Self-Assessment and Reflective Practice (SRP)	12
5	Interactive and Motivational Learning Orientation (IML)	9
Total no. of items		**58**

2.3. Final Tryout

The final tryout for tool standardization of 2nd draft was conducted with 387 prospective teachers of 2 states, namely Rajasthan, and Delhi. After that item analysis was done by the researcher using SPSS version 25.0. The item analysis of the scale is discussed below in the section.

2.4. Item Analysis

After completing the initial try-out, statements were assigned numbers according to the mentioned ratings as "1 for Strongly Disagree, 2 for Disagree, 3 for Undecided, 4 for Agree and 5 for Strongly Agree". A clear pattern emerges, indicating that items with R-values equal to or greater than approximately 0.30 are generally selected, while those below this threshold are rejected. The selected and rejected items based on R-values are shown below in the Table 3.

Table 3. R-value of Each Item

S. No.	Items	R-Value	Result	S. No.	Items	R-Value	Result
1.	RLN 1	.415	Selected	**30.**	**EPL 5**	**.086**	**Rejected**
2.	**RLN 2**	**.143**	**Rejected**	**31.**	**EPL 6**	**.115**	**Rejected**
3.	RLN 3	.321	Selected	32.	EPL 7	.536	Selected
4.	**RLN 4**	**.164**	**Rejected**	**33.**	**EPL 8**	**.078**	**Rejected**
5.	RLN 5	.357	Selected	34.	EPL 9	.331	Selected
6.	RLN 6	.316	Selected	35.	EPL 10	.373	Selected
7.	RLN 7	.302	Selected	**36.**	**EPL 11**	**.264**	**Rejected**
8.	**RLN 8**	**.256**	**Rejected**	37.	EPL 12	.570	Selected
9.	RLN 9	.350	Selected	**38.**	**SRP 1**	**.254**	**Rejected**
10.	RLN 10	.316	Selected	39.	SRP 2	.393	Selected
11.	**RLN 11**	**.273**	**Rejected**	**40.**	**SRP 3**	**.029**	**Rejected**
12.	**RLN 12**	**.136**	**Rejected**	41.	SRP 4	.388	Selected
13.	RLN 13	.448	Selected	42.	SRP 5	.386	Selected
14.	**ASL** 1	**.002**	**Rejected**	43.	SRP 6	.497	Selected
15.	ASL 2	.331	Selected	44.	SRP 7	.405	Selected
16.	**ASL 3**	**.242**	**Rejected**	45.	SRP 8	.419	Selected
17.	**ASL 4**	**.233**	**Rejected**	46.	SRP 9	.347	Selected
18.	ASL 5	.377	Selected	47.	SRP 10	.560	Selected
19.	**ASL 6**	**.184**	**Rejected**	48.	SRP 11	.310	Selected
20.	ASL 7	.322	Selected	49.	SRP 12	.354	Selected
21.	ASL 8	.452	Selected	50.	IML 1	.461	Selected
22.	**ASL 9**	**.145**	**Rejected**	**51.**	**IML 2**	**.216**	**Rejected**
23.	ASL 10	.424	Selected	52.	IML 3	.541	Selected
24.	**ASL 11**	**.131**	**Rejected**	**53.**	**IML 4**	**.235**	**Rejected**
25.	**ASL 12**	**-.169**	**Rejected**	54.	IML 5	.327	Selected
26.	**EPL 1**	**.293**	**Rejected**	**55.**	**IML 6**	**.277**	**Rejected**
27.	**EPL 2**	**.196**	**Rejected**	56.	IML 7	.480	Selected
28.	EPL 3	.543	Selected	57.	IML 8	.322	Selected
29.	EPL 4	.310	Selected	58.	IML 9	.521	Selected

Out of the total 58-items, 35-items were selected and 23-items were rejected as the values of the items were less than 0.30, which shows a weak correlation between the item and the dimension. The items of ASL dimension had the highest rejection rate, whereas the items of SRP and IML dimensions demonstrated stronger performance with a majority of items meeting the selection criteria. Overall, the R-value serves as a consistent and reliable metric for determining item selection across all items and dimensions.

2.5. Exploratory Factor Analysis on Instructional Preference Scale (EFA on IPS)

All the items were retained as the factor loadings for all items were greater than 0.4 and five factors were extracted. These factors named Responsiveness to Learner Needs (8-items), Autonomy and Self-Direction in Learning (5-items), Experiential and Problem-Centered Learning (6-items), Self-Assessment and Reflective Practice (10-items) and 6-items under Interactive and Motivational Learning Orientation (6-items). The value for Bartlett's Test of Sphericity (BTS) was significant (sig<0.05). Also, the value for Kaiser-Meyer-Olkin (KMO) was acceptable (0.869; >0.6). The EFA solution explained the total variance of around 58.26 percent, which is acceptable. The EFA on Instructional Preference Scale has been shown below in the Table 4.

Table 4. Exploratory Factor Analysis on Instructional Preference scale
(KMO= 0.869; BTS= 0.000; Variance= 58.26)

S. No.	Items	Dimensions				
		RLN	ASL	EPL	SRP	IML
1.	RLN1	.605				
2.	RLN2	.609				
3.	RLN3	.676				
4.	RLN4	.696				
5.	RLN5	.543				
6.	RLN6	.775				
7.	RLN7	.701				
8.	RLN8	.558				
9.	ASL1		.822			
10.	ASL2		.658			
11.	ASL3		.766			
12.	ASL4		.566			
13.	ASL5		.697			
14.	EPL1			.533		
15.	EPL2			.802		
16.	EPL3			.671		
17.	EPL4			.678		
18.	EPL5			.648		
19.	EPL6			.829		
20.	SRP1				.560	
21.	SRP2				.533	
22.	SRP3				.732	
23.	SRP4				.518	

24.	SRP5	.797
25.	SRP6	.794
26.	SRP7	.675
27.	SRP8	.576
28.	SRP9	.699
29.	SRP10	.839
30.	IML1	.786
31.	IML2	.638
32.	IML3	.626
33.	IML4	.769
34.	IML5	.864
35.	IML6	.627

2.6. Reliability Analysis

For reliability analysis, Cronbach's alpha reliability was calculated with the help of SPSS version 25.0. The dimension-wise reliability values have been shown below in the Table 5.

Table 5. Reliability Value of Instructional Preference Scale

S. No.	Dimensions	No. of Items	Alpha Value	Result
1	Responsiveness to Learner Needs (RLN)	08	0.79	RLN construct is found reliable (α-value > 0.70)
2	Autonomy and Self-Direction in Learning (ASL)	05	0.70	ASL construct is found reliable (α-value > 0.70)
3	Experiential and Problem-Centered Learning (EPL)	06	0.73	EPL construct is found reliable (α-value > 0.70)
4	Self-Assessment and Reflective Practice (SRP)	10	0.68	SRP construct is found reliable (α-value ≈ 0.70)
5	Interactive and Motivational Learning Orientation (IML)	06	0.78	IML construct is found reliable (α-value > 0.70)
Overall Reliability		**35**	**0.74**	Found reliable (α-value > 0.70)

The reliability of all the dimensions such as RLN, ASL, EPL, SRP and IML were found to be 0.79, 0.70, 0.73, 0.68, and 0.78 respectively, which shows the acceptable values of all the dimensions. Further, the overall value of reliability was found to be 0.74, which shows good internal reliability of the scale as the value ranges from 0.6 to 0.9, and accepted as good internal reliability (Kumar, 2020). Therefore, it can be concluded that the scale assesses the Instructional Preference of prospective teachers. After establishing the reliability, norms of Instructional Preference Scale were calculated.

2.7. Final Draft of Instructional Preference Scale

After item analysis of Instructional preference Scale, the final draft was having 35-items as 23-items were rejected based on the acceptable values of correlation. The dimension-wise number of items retained in the final draft has been shown below in the Table 6.

Table 6. Final Draft of Instructional Preference Scale

S. No.	Dimensions	Items	No. of items
1	Responsiveness to Learner Needs (RLN)	1, 2, 3, 4, 5, 6, 7, 8	8
2	Autonomy and Self-Direction in Learning (ASL)	9, 10, 11, 12, 13,	5
3	Experiential and Problem-Centered Learning (EPL)	14, 15, 16, 17, 18, 19	6
4	Self-Assessment and Reflective Practice (SRP)	20, 21, 22, 23, 24, 25, 26, 27, 28, 29	10
5	Interactive and Motivational Learning Orientation (IML)	30, 31, 32, 33, 34, 35	6
	Total no. of items		**35**

In the final draft of Instructional Preference Scale, 35-items were retained under the five dimensions of Instructional Preference scale. In this scale, there are 8-items under Responsiveness to Learner Needs (RLN) dimension, 5-items Autonomy and Self-Direction in Learning (ASL) dimension, 6-items under Experiential and Problem-Centered Learning (EPL) dimension, 10-items under Self-Assessment and Reflective Practice (SRP) dimension and 6-items under Interactive and Motivational Learning Orientation (IML) dimension. Further, exploratory factors analysis on Instructional Preference Scale was done for the factor analysis of the items. The final instructional preference scale for prospective teacher is provided under Appendix I.

2.8. Norms of Instructional Preference Scale

The norms of Instructional Preference Scale in the form of standard scores were calculated on the basis of z-scores and t-scores of the full-scale data. The z-scores and t-scores were calculated using Microsoft Excel and the scores for Instructional Preference Scales have been shown below in the Table 7.

Table 7. z-Scores and t-Scores for Instructional Preference Scale (N=387; Mean=132.05: S.D.= 20.92)

Raw Scores	z-Scores	t-Scores	Raw Scores	z-Scores	t-Scores
83	-2.34465	26.55354	**130**	-0.09799	49.02008
86	-2.20124	27.98757	**131**	-0.05019	49.49809
88	-2.10564	28.94359	**132**	-0.00239	49.9761
89	-2.05784	29.42161	**133**	0.045411	50.45411
90	-2.01004	29.89962	**134**	0.093212	50.93212
93	-1.86663	31.33365	**135**	0.141013	51.41013
94	-1.81883	31.81166	**136**	0.188815	51.88815
95	-1.77103	32.28967	**137**	0.236616	52.36616
96	-1.72323	32.76769	**138**	0.284417	52.84417
97	-1.67543	33.2457	**139**	0.332218	53.32218
98	-1.62763	33.72371	**140**	0.380019	53.80019
99	-1.57983	34.20172	**141**	0.42782	54.2782
100	-1.53203	34.67973	**142**	0.475621	54.75621

101	-1.48423	35.15774	**143**	0.523423	55.23423
102	-1.43642	35.63576	**144**	0.571224	55.71224
103	-1.38862	36.11377	**145**	0.619025	56.19025
104	-1.34082	36.59178	**146**	0.666826	56.66826
105	-1.29302	37.06979	**147**	0.714627	57.14627
106	-1.24522	37.5478	**148**	0.762428	57.62428
107	-1.19742	38.02581	**149**	0.810229	58.10229
108	-1.14962	38.50382	**150**	0.858031	58.58031
110	-1.05402	39.45985	**151**	0.905832	59.05832
111	-1.00621	39.93786	**152**	0.953633	59.53633
112	-0.95841	40.41587	**153**	1.001434	60.01434
113	-0.91061	40.89388	**154**	1.049235	60.49235
114	-0.86281	41.37189	**155**	1.097036	60.97036
115	-0.81501	41.8499	**156**	1.144837	61.44837
116	-0.76721	42.32792	**157**	1.192639	61.92639
117	-0.71941	42.80593	**158**	1.24044	62.4044
118	-0.67161	43.28394	**159**	1.288241	62.88241
119	-0.6238	43.76195	**160**	1.336042	63.36042
120	-0.576	44.23996	**161**	1.383843	63.83843
121	-0.5282	44.71797	**162**	1.431644	64.31644
123	-0.4326	45.674	**163**	1.479446	64.79446
124	-0.3848	46.15201	**165**	1.575048	65.75048
126	-0.2892	47.10803	**166**	1.622849	66.22849
127	-0.2414	47.58604	**167**	1.67065	66.7065
128	-0.19359	48.06405	**168**	1.718451	67.18451
129	-0.14579	48.54207	**172**	1.909656	69.09656

After calculating Z-scores and T-scores for IPS, the level of Instructional preference scale was assigned as low, medium and high based on their z-scores and their corresponding raw scores have been shown below in the Table 8.

Table 8. Levels of Instructional Preference Scale

S. No.	z-Scores	Raw Scores	Level of IP Scale
1.	-1.26 and below	105 and below	Low
2.	-1.25 to +1.25	106 to 158	Medium
3.	+1.26 and above	159 and above	High

From the above Table 8, it can be seen that prospective teachers who obtained z-scores of -1.26 and below, corresponding to raw scores of 105 and below are categorized as low level of Instructional Preference having pedagogical instructional preference, further the z-scores ranging from -1.25 to +1.25 and raw scores lie between 106 to 158, fall under the category of medium level of Instructional Preference having pedagogical and

andragogical preference equally and for the high level of Instructional Preference having andragogic preference, the z-scores would be +1.26 and above and raw scores were 159 and above.

2.9. Scoring of Instructional Preference Scale

The instructional preference scale was constructed by the researcher himself, where responses are collected using 5-point Likert scale. For scoring purpose, each response was assigned a numerical value. The positive items were scored from 5 (Strongly Agree) to 1 (Strongly Disagree) whereas the negative items were scored from 5 (Strongly Disagree) to 1 (Strongly Agree) to ensure that a higher score consistently indicated a higher level of instructional preference among prospective teachers. A total for each participant was obtained by summing the numerical values of all items. This final score reflects the overall level of the measured construct, with higher scores indicating a greater degree of andragogical instructional preference. Minimum score is 35 and maximum score is 175.

3. Conclusion

The present study focused on the development and validation of for instructional preferences scale to measure the instructional orientations of prospective teachers. The quantitative analysis for the scale yielded strong evidence of reliability and construct validity. The results of EFA and internal consistency coefficients indicated a stable measurement across item with the value of 0.74. The findings suggest that instrument effectively translates complex theoretical dimensions into empirically measurable components, facilitating systematic evaluation and comparative research in teacher education. This validated tool provides a sound empirical basis for instructional preference as the reliability value is greater than 0.6 and close to 0.8. Nevertheless, the validation process was limited to a specific population, underscoring the need for further studies to examine measurement invariance across diverse educational contexts and demographic groups. Overall, the validated instrument represents a reliable and theoretically grounded measure that contributes meaningfully to the quantitative study on instructional preference at higher education and supports the advancement of evidence-based educational practices.

4. Future Suggestions

Future research should focus on extending the validation of the IPS across broader populations and contexts, examining its relationship with teacher identity and professional development, and applying it as an evaluative tool for learner-centered interventions. Longitudinal and comparative investigations can further illuminate how andragogical orientations evolve within the dynamic continuum of teacher learning and professional practice. Other future researches can focus on:

- **Test practical strategies:** Future studies can explore how specific teaching practices, such as reflective teaching sessions, peer mentoring, or classroom-based projects shape andragogical preferences over time.
- **Link beliefs with teacher growth:** Research can look at how the IPS dimensions relate to key aspects of teacher development, including professional identity, teaching confidence, and learner agency. Understanding these links can show how adult-learning attitudes support effective teaching.
- **Compare different contexts:** Studies across institutions, regions, or countries can reveal how cultural and institutional factors affect the way andragogical ideas are understood and used in teacher education.

- **Adapt for digital learning:** As technology becomes central to teacher preparation, future work can adapt the AIPS for online or blended programs. This would help explore how self-directed and experience-based learning take shape in digital spaces and contribute to the broader move toward learner-centered education

Appendices

Appendix (I). Instructional Preference Scale for Prospective Teachers

Dimensions	S.No.	Statement	SA	A	UD	D	SD
Responsiveness to Learner Needs	1.	I believe problem solving is an essential component of effective teaching.					
	2.	In my view, integrating new teaching methods is a difficult task for teachers.					
	3.	I believe teaching should be focused on helping students understand their learning pattern and process.					
	4.	I think students' experiences should be the center for knowledge construction.					
	5.	I think lecture method is sufficient to fulfill learning needs at higher education level.					
	6.	I believe that using diverse teaching methods and techniques enriches learning.					
	7.	The aim of teaching is only to help the students excel in examinations.					
	8.	I believe field exposure at the higher education level bridges the gap between theory and practice.					
Autonomy and Self-Direction in Learning	9.	During the teaching-learning process, learners prior experiences should be utilized as a resource for learning.					
	10.	In my view curiosity of the learners should not be ignored by the teacher.					
	11.	I believe, clearly setting learning goals in my mind is necessary for learning.					
	12.	I believe, to learn something; learners need to follow teacher's instructions only.					
	13.	I believe only teachers can devise a learning plan for the learners.					
Experiential and Problem-Centered Learning	14.	I think teachers should use multiple method of teaching to foster constructive learning.					
	15.	I consider group learning as a waste of time.					
	16.	I believe active participation of learners is pre-requisite for learning.					
	17.	I do not think the interaction between teacher and learner affects the effectiveness of teaching.					
	18.	I think learners' freedom to decide the way of learning should not be considered by the teacher.					
	19.	I think, learners' needs and interest should be the primary consideration for effective teaching.					

Self-Assessment and Reflective Practice	20.	I believe, regular assessment and feedback play a limited role in motivating students to learn.					
	21.	I prefer peer assessment as it is beneficial for learners in their learning.					
	22.	I think, assessment by teacher is much better than self-assessment.					
	23.	I believe self-reflection is one of the most effective ways of learning.					
	24.	I believe that only written tests can be used for assessing the learners' academic growth.					
	25.	I prefer to conduct self-assessment on a regular basis.					
	26.	Learning needs of learners at higher education can only be assessed by the teacher.					
	27.	I believe students should initiate self and peer-assessment instead of depending on teachers' assessment.					
	28.	I prefer not to engage in self-assessment after receiving the teacher's remarks.					
	29.	I prefer such instructions which helps to create a self-assessment-based learning environment.					
Interactive and Motivational Learning Orientation	30.	Learners should avoid asking questions during the class.					
	31.	I think a friendly environment between teacher and learners doesn't help in learning.					
	32.	Discussions on real-life experiences improves the learners' self-concept.					
	33.	Students' expectations should not be considered by the teacher while teaching.					
	34.	I believe that now the role of the teacher is of a facilitator and guide for learning.					
	35.	I think, learners' motivation is not an important factor for learning.					

Appendix (II). Scoring Procedure

The positive items (1,3,4,6,8,9,10,11,14,16,19,21,23,25,27,29,32,34) are scored from 5 (Strongly Agree) to 1 (Strongly Disagree) whereas the negative items (2,5,7,12,13,15,17,18,20,22,24,26,28,30,31,33,35) are scored from 5 (Strongly Disagree) to 1 (Strongly Agree). A total for each participant is obtained by summing the numerical values of all items. This final score reflects the overall level of the measured construct, with higher scores indicating a greater degree of andragogical instructional preference. Minimum score is 35 and maximum score is 175.

Declarations

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Competing Interests Statement

The authors declare that they have no competing interests related to this work.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

Both the authors took part in literature review, analysis, and manuscript writing equally.

Availability of data and materials

Supplementary information is available from the authors upon reasonable request.

Institutional Review Board Statement

Not applicable for this study.

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