

Validating the EFL Teacher Collegiality Scale in the Iranian Context: A Mokken Scale Analysis

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ABSTRACT

This study examines collegiality among Iranian EFL teachers by developing and validating the EFL Teacher Collegiality Scale (ETCS) through Mokken Scale Analysis (MSA). Collegiality, which we often understand as mutual respect, teamwork, and shared responsibility, is widely acknowledged as essential for promoting positive school environments and supporting teachers' well-being. Specifically, collegiality supports teacher well-being, operationalized as job satisfaction, lower emotional exhaustion/burnout, and stronger professional efficacy. In Iran's educational context, specific challenges make promoting teacher collaboration more difficult. To fill an important gap in the existing research, this study introduces a culturally adapted, reliable instrument designed to measure collegiality within this context. A cross-sectional survey using a 30-item ETCS was administered online to collect data from 170 teachers from various educational backgrounds. The ETCS is organized into three main areas: collaborative practice, professional support and mentorship, and shared professional development. The development process of the ETCS instrument involved expert review and back translation. Analysis showed that the scale has strong scalability and internal consistency, with high Mokken H coefficients across all subscales. The findings indicate that strong collegiality boosts teacher satisfaction, supports retention, and builds professional networks. Finally, this study provides practical strategies and a validated tool to improve EFL teacher collaboration and highlights online collegiality in remote or hybrid settings as a key topic for future research.

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1. Introduction

Collegiality has become an increasingly prominent priority in school discourse, especially as educators respond to mounting professional demands. Collegiality—the relationship among professional colleagues based on mutual respect and cooperation (Guellouma & Bilouk, 2024; Shah, 2012)—is a central component of productive school cultures and of long-term teacher participation and success.

There is a strong body of evidence establishing many advantages of collegiality. Collegial work settings promote job satisfaction among teachers, facilitate ongoing professional growth, reduce stress, and burnout (Shah, 2012). Collegial work settings promote reflective teaching practice and promote instructional innovation (Pugach & Johnson, 1995). Further, collegiality is associated with increased teacher retention and organizational commitment (Ingersoll & Strong, 2011; Shah, 2012), which in turn affects student success. For learners, learning in collegial environments is linked to greater achievement and improved social-emotional health (Shah, 2012). At the school level, collegiality is linked to a more integrated school culture and longer-term school improvement (Goddard, 2001; Hargreaves & Fullan, 2015).

In spite of these claimed benefits, successful collaborative teaching is often hindered. Inhibitors of collaborative planning are often inadequate time schedules for working together, weak institutional backing, and inflexible administrative pyramids (Hess & Kelly, 2007; Samuelsson, 2018). These inhibitions are also clearly evident in the Iranian context of EFL, where supporting infrastructures for teacher collaboration are sometimes in their infancy or nonexistent.

Despite extensive claims about collegiality, no culturally tailored, psychometrically validated instrument exists for Iranian EFL settings, and Mokken Scale Analysis has rarely been applied to this construct. To address this gap, the present study investigates collegiality among Iranian EFL instructors using Mokken Scale Analysis, a nonparametric item response theory particularly suited for hierarchical constructs in social science research. The study aims to uncover latent dimensions of collegiality, assess its prevalence, explore its impact on teachers' participation in the EFL community, and provide practical recommendations for schools to enhance professional development, teacher job satisfaction, and student outcomes. Specifically, the research establishes specific objectives which include developing an EFL Teacher Collegiality Scale (ETCS) that incorporates cultural adaptation. The study investigates dimensionality through Mokken Scale Analysis. The researchers assess scalability (Loevinger's H) alongside reliability indices (α , λ_2 , ρ , LCRC) and present descriptive distribution data for the scale's subscales. The study addresses the following research questions:

RQ1: What dimensional structure of collegiality is supported for the ETCS by Mokken Scale Analysis?

RQ2: Do the ETCS subscales meet accepted thresholds for scalability (H) and reliability (α , λ_2 , ρ , LCRC)?

RQ3: What are the central tendencies and dispersion of collegiality across the three subscales among Iranian EFL teachers?

2. Theoretical and Empirical Background

This section provides the conceptual and empirical background for the current study, which focuses on the development and validation of a scale to assess teacher collegiality among Iranian EFL teachers. The review begins with general scholarship on collegiality and gradually narrows to EFL contexts, highlighting the specific methodological gap addressed by this study. Collegiality is defined as a professional concept grounded in trust, cooperation, and mutual professional development. The section first establishes the main elements of collegial culture, trust, shared accountability, collective practice, and ongoing development drawing on foundational literature. It then introduces social exchange theory as the theoretical framework for this study, explaining how professional relationships are built and maintained in terms of perceived costs and rewards. Following the theoretical grounding, the review examines empirical evidence on collegiality in EFL contexts, especially its links with teacher well-being and digital collaboration, and identifies the gap this study aims to address.

2.1. Core Dimensions of Collegial Culture

What emerges from the literature is that collegiality is not a one-dimensional, flexible construct; collegiality includes structural, relational, and developmental dimensions. So, trust remains central to collegial culture, which gives teachers an opportunity to talk through their vulnerabilities, concerns and to provide and receive constructive feedback in a trusting and supportive environment. Trust begets a common understanding of shared responsibility, that is, teachers no longer consider student achievement an individual success, but rather a shared responsibility (Betzler & Loschke, 2021; Bryk et al., 2010; Hargreaves & O'Connor, 2018).

An equally important aspect of collegial culture is collective decision-making and collaborative knowledge construction. Again, collegiality is expressed through reflective and deliberative dialogue, or “thinking together” (John-Steiner, 1997). Collective curriculum planning, classroom observations and shared instructional goals are associated with increased professionalism with which teachers engaged, as well as increased instructional effectiveness (Friend & Cook, 1996; Hargreaves & Fullan, 2012). This dimension highlights collegiality as more than just a static quality, but rather as an enacted practice embedded in the day-to-day practice of pedagogy.

Another element pertains to the long-term professional development commitment in collegial networks. Research suggests that collective physical and virtual learning spaces support ongoing learning, as these spaces allow teachers to leverage each other's experiences, materials, and knowledge. These spaces can establish opportunities for adaptive expertise and collaborative progress, strengthening a culture of ongoing professional renewal (Jarzabkowski, 2002; Kianinezhad, 2023, 2024; Louis & Marks, 1995; Nordgren et al., 2021). In this interplay of trust, shared involvement, and development commitment, collegiality represents a spiritually driven cultural force that not only influences teachers' professional lives but also the school's institutional path.

3. Theoretical Framework

3.1. Teacher Collegiality Conceptualization

Teacher collegiality in modern education is an essential motivating force for the realization of continuous professional growth and school development. Anything but restricted to social friendship or even casual social attachment, teacher collegiality is an energetic professional phenomenon built on trust, collective responsibility, and shared interest in teaching and learning culture (Blair et al., 2023). It is a move from the single-isolated traditional model of instruction (Lee & Choi, 2024; Lortie, 2020; Seyri & Ghiasvand, 2025) to one with collaboration, co-reflection, and collective problem-

solving. Empirical evidence repeatedly shows that high-collegial-culture schools exhibit higher teacher satisfaction, organizational commitment, pedagogical imagination, and enhanced pupil performance (Bryk et al., 2010; Hargreaves & Fullan, 2015; Louis & Marks, 1995; Johnson et al., 2005). All the evidence substantiates collegiality as something greater than administrative procedure but as an agent of institutional accomplishment and professional hardiness.

3.2. Social Exchange Theory

To discover how collegial relationships form and are sustained, the present study adopts Social Exchange Theory (SET) (Blau, 1964) as the conceptual theory. According to SET descriptions, individuals pursue relationships as rational cost-benefit analyses. Within the academic environment, collegiality involves real and abstract investments. Benefits can be described as emotional support, exposure to new and innovative methods, pooled resources, and professional affirmation (Ismail, 2014; Jarzabkowski, 2002). Costs may consist of the time and emotional capital required for collaboration as well as the risk associated with exposing one's teaching practice. As teachers start to find that the payoffs of participation exceed the costs, they will be more committed and will continue to preserve collegial relationships. As repeated contacts in the long term are based on a system of norms that support trust, reciprocity, and shared obligation collaborative culture gets institutionalized. SET thus gives us a descriptive and predictive model of a dynamic and reciprocal form of collegiality as a professional process.

Importantly, in the context of the present study, SET is explicitly linked to the expected hierarchical ordering of ETCS items (cost-benefit patterns) tested via Invariant Item Ordering (IIO) in Mokken Scale Analysis. We articulate how perceived costs (e.g., time, exposure to critique) and benefits (e.g., resource sharing, mentoring) in EFL departments map onto item difficulty and ordering, allowing collegial behaviors and perceptions to be modeled as structured, measurable phenomena in alignment with SET principles.

3.3. Empirical Background

Emerging trends in ed-tech have redefined the spatial and temporal boundaries of collegial interactions. Through hybrid and online pedagogical frameworks, digital collegiality maturation of professional relations through virtual spaces has come under academic scrutiny. Valerdi and Rodriguez (2023) comment that though technology makes it easier to share resources and work asynchronously, it is not necessarily imbued with the spontaneity and interpersonal richness on which trust relies.

Besides, Ashrafian and Alimohammadi (2024) and also Susiana and Priyatn (2025) are certain that purposeful infrastructure, i.e., formal virtual forums, communal digital workplaces, and online professional learning environments, is necessary in order to build genuine collegiality within virtual spaces. For EFL teachers themselves, who are themselves frequently working in decentralized or multilingual contexts, digital collegiality holds new promise for collaboration both within and between institutional and geographical spaces. Its viability will depend, however, on institutionally backed support and the deliberate construction of digital norms and communities.

Besides, increasing numbers of research indicate the importance of collegiality in enhancing teacher well-being. Collegial networks teach emotional support lessons, decrease isolation, and enhance professional identity, especially among initial-career

teachers who must struggle through challenging school contexts (Blair et al., 2023; Montoya & Jiménez, 2025; Lee & Choi, 2024). Parker and Lonsdale (2024) discovered that teachers with robust collegial support networks were overwhelmingly more job-satisfied and more likely to remain in the occupation long-term. This is to further highlight collegiality as both a marker of professional competence and a necessary condition of personal and occupational sustainability.

Despite broad recognition of teacher collegiality as the linchpin of successful schooling, scholarship has largely overlooked the structural diversity and situational dynamics of collegiality, especially in non-Western and subject-focused settings like Iranian EFL instruction. Furthermore, scant empirical attention has been given to incorporating collegiality's interface with electronic collaboration and teacher happiness into a coherent, quantifiable model. Based on this, the present study aims to address this methodological and theoretical divide through the use of Mokken Scale Analysis in developing and validating a culturally translated EFL teacher collegiality measure in Iran. Such a methodology not only provides a psychometric model but also permits multidimensionality of inquiry into collegiality as manifested in the current, networked pedagogical landscapes.

4. Methods

Here, the methodological steps involved in the construction and validation of the EFL Teacher Collegiality Scale (ETCS) are described. This section outlines the study design, participants' characteristics, instrument adaptation and development process, data collection procedures, and data analysis methods, with Mokken Scale Analysis (MSA) highlighted as the primary psychometric technique.

4.1. Participants

The study included 170 Iranian EFL instructors working in various institutional settings across Iran, including universities, language institutes, and schools. Demographic information collected comprised age, gender, first language, academic degree, teaching experience, and teaching setting. Participants were recruited through convenience sampling, supplemented by snowballing via professional networks and online teaching communities, ensuring representation of teachers from diverse backgrounds and settings. The sample consisted of 71% female and 29% male instructors. Also, participants' highest degrees were BA (65%), MA (31%), and PhD (4%). Regarding teaching environment, 45% taught at language institutes, 35% at universities, and 20% at schools. Teaching experience ranged from 1 to over 20 years, with a mean of 7.8 years. All participants provided informed consent and were assured of the confidentiality and anonymity of their responses.

4.2. Data Collection Instruments

ETCS was built through a theory-driven and rigorous process. A synthesis of recent literature on workplace soft skills, collegiality among teachers, and continuing professional development (CPD) underpinned the conceptual structure of the scale. Three fundamental dimensions of collegiality were inferred through this synthesis:

1. Collaborative Practice (CP)
2. Professional Support and Mentorship (PSM)
3. Shared Professional Growth (SPG)

Accordingly, with these dimensions as a starting point, a preliminary 55-item pool of statements representing observable behaviors and attitudes was developed. This item

pool was then reviewed by a group of six expert reviewers, consisting of TEFL faculty and academic mentors, who rated each statement in terms of clarity, cultural appropriateness, and correspondence to the intended constructs. Based on their feedback, 25 items were revised or eliminated, resulting in a 30-item scale. Evidence of validity included content validity (expert review and back translation) and internal structure (MSA scalability, monotonicity, and invariant item ordering), complemented by reliability indices. Further, an argument-based validity framework is suggested as a direction for future work.

Dimension 1: Collaborative Practice

- I frequently co-plan lessons or curriculum units with colleagues.
- My colleagues and I share teaching materials and resources freely.
- Whenever a student comes to me with a problem, I feel comfortable asking my colleagues for suggestions.
- We share team meetings where we collectively address teaching problems.
- I specifically attend other teachers' classes to observe.
- My peers and I make joint decisions regarding assessment techniques or criteria.
- I feel my input to team decisions and discussions is respected.
- We frequently discuss as a group the effectiveness of our teaching methodology.
- I am able to adjust my own plans in order to accommodate an effective team objective.
- I feel a sense of shared responsibility for student success in my department.

Dimension 2: Professional Support and Mentorship

- My colleagues assist me when I am experiencing a professional dilemma.
- I feel at ease offering constructive criticism to my colleagues.
- My colleagues give me constructive, useful criticism.
- Veteran teachers in my organization explicitly mentor new employees.
- We appreciate and recognize each other's professional achievement and success.
- In case I make a mistake, staff are encouraging instead of judgmental.
- I feel I have good respect between staff members.
- I would give time to assist a member of staff if they required it.
- We share openly the pressures and issues of the job.
- Staff have a high sense of respect for each other.

Dimension 3: Shared Professional Growth

- My colleagues and I also frequently talk about new articles or studies on teaching.
- We challenge one another to try new approaches to teaching.
- I regularly attend workshops or in-services with my colleagues.
- My colleagues challenge me to work towards my own professional growth objectives.

- We all make an active effort to enhance the overall instructional program of the school.
- Our professional discussions challenge me to think critically about my teaching.
- We all look for new learning in order to solve school-level problems.
- I have learned new skills directly from learning others.
- My peers and I share one image of what excellence in teaching is.
- My interactions with my peers motivate me to be an improved and creative teacher.

4.3. Translation and Adaptation

To maintain linguistic and conceptual equality for Persian-speaking participants, the ETCS was subjected to a stringent process of back-translation. The tool was first translated from English to Persian by a bilingual specialist. Another bilingual specialist who was blind to the original version then translated the Persian version into English. The two English versions were reviewed by the research team, and minor differences were refined through mutual discussions to achieve cultural sensitivity and content fidelity. Finally, the completed instrument of ETCS has two broad sections. Section A: Demographic Details comprises background information that is relevant, such as gender, educational qualification, teaching experience in years, and the teaching environment. Section B: Collegiality Statements contains 30 statements that are used to quantify collegiality, each rated on a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree), and the items are allocated across three broad constructs of collegiality.

4.3.1. Data Collection Procedure

Data were collected between April and June 2025 through invitations distributed via institutional mailing lists and professional networks. Also, the online questionnaire remained accessible to participants for four weeks after receiving invitations through institutional mailing lists and professional networks. Each submitted response underwent a thorough examination for completeness and accuracy before reaching the analysis phase. The analysis proceeded through various stages which started with descriptive statistics followed by Automated Item Selection Procedure (AISP) then calculations of Loevinger's H coefficients (H , Hi , Hij) before testing monotonicity and invariant item ordering and finally, reliability assessment using multiple indices (α , λ_2 , ρ , LCRC).

4.4. Study Design and Analysis

This research employed a quantitative, descriptive research design with the central aim of creating a psychometrically valid instrument for measuring collegiality among Iranian EFL teachers. The design is suitable for the validation of instruments because it allows for detailed and systematic investigation of concepts without intervention or manipulation. Thus, no experimental treatment was administered and as a result, the study used a cross-sectional survey of teachers' self-reports. Moreover, the design can sustain the purpose of provoking teachers' perceptions and actions toward collegial behaviors under real-life conditions.

Data analysis was done in two broad phases. Descriptive statistics were first computed on SPSS Version 24 for the collected data and initial analysis provided an overview of data distribution and assisted in checking for variability required for

psychometric validation. In this stage, means and standard deviations were also calculated for each subscale to summarize teachers' satisfaction with collegiality and examine the variability of responses across the Likert-scale items. The second step was to evaluate the psychometric soundness of the EFL Teacher Collegiality Inventory (ETCS) using Mokken Scale Analysis (MSA), which is a nonparametric item response theory (IRT) model, run with the "Mokken" package for R. The reason MSA was selected was due to its flexibility in analyzing data at the ordinal level and its convenience in identifying unidimensional, hierarchical scales without stringent assumptions like normality or equal intervals. Hence, structural validity evidence was assembled by completing the AIS, Loevinger's H coefficients, monotonicity tests, and invariant item ordering (IIO), as well as generating multiple reliability indices (α , λ_2 , ρ , LCRC) as an adjunct to the validity evidence, but not as a substitute.

In order to determine the item and item-pair scalability of constructs, Loevinger's H coefficients were computed at the total scale (H), item (H_i), and item-pair (H_{ij}) levels. The coefficients express the extent to which items represent a cumulative scale structure, and interpretive standards are as follows: $H < 0.30$ suggests non-scalability, $0.30-0.39$ suggests weak scalability, $0.40-0.49$ suggests moderate scalability, and $H \geq 0.50$ suggests strong scalability. Automated Item Selection Procedure (AIS) was used to group items into likely unidimensional subscales and remove non-informative items that are not in line with the latent structure. Two model assumptions were tested to establish Mokken model fit: monotonicity, which establishes whether the probability of responding to an item enhances as a function of the latent trait, and invariant item ordering (IIO), which tests whether relative item difficulty is stable across respondents.

To examine the internal reliability of the ETCS and the three subscales (Collaborative practice, professional support & mentorship, and shared professional growth) in detail, four acknowledged reliability coefficients that were estimated include:

1. Cronbach's Alpha (α) (Cronbach 1951): A standard and norm measure of internal consistency. Any value that is acceptable is greater than 0.70, and any value greater than 0.80 confirms good reliability.
2. Guttman's Lambda-2 (λ_2) (Guttman 1945): A very reliable alternative to alpha, especially when the item variances are unequal, providing a better lower-bound estimate of reliability.
3. Mokken Scale Reliability (ρ) (Mokken 1971): A model-based coefficient appropriate for nonparametric IRT. It provides an estimate of the extent to which the scale items measure a unidimensional latent trait.
4. Latent Class Reliability Coefficient (LCRC): A sophisticated measure that controls for heterogeneity of responses in the latent state, particularly valuable when examining item consistency in heterogeneous populations and in fact, all four measures of reliability were computed to provide consistency and triangulation.

5. Results

This part reports the findings of the psychometric test of the EFL Teacher Collegiality Scale (ETCS), structured around the study's three research questions. Accordingly, the analyses were undertaken for three purposes in the following order: (1) first the descriptive statistics were computed to examine the distributional characteristics of the respondents' scores (see Table 1) in relation to RQ3 about the central tendency (mean) and variability (standard deviation) of collegiality scores for each of the three subscales,

(2) then a Mokken Scale Analysis (MSA) was conducted to examine the dimensionality, orderable, scalability of the scale (see Table 2) to respond to RQ1 regarding the dimensional structure supported by MSA procedure, and finally, (3) to respond to RQ2 about the scalability and reliability of the ETCS subscales four complementary reliability indices, namely Cronbach's Alpha (α), Guttman's Lambda-2 (λ_2), Mokken Scale Reliability (ρ), and the Latent Class Reliability Coefficient (LCRC) were determined to assess internal consistency of the instrument (see Table 3).

5.1. Descriptive Statistics

Descriptive statistics were also calculated to analyze central tendencies, variability, and response distribution across three subscales of ETCS. These are collaborative practice, professional support & mentorship, and shared professional growth. Findings are emphasized in Table 1. As can be seen, the mean score for all subscales lies in the upper-middle range on the five-point Likert scale (3.78 to 3.94), reflecting overall positive feelings towards collegiality among the respondents. Standard deviations ranged from 0.77 to 0.95, which is a reasonable spread. Skewness and kurtosis measures were all within ± 1 , meaning responses to the items were approximately normally distributed (Sijtsma & Molenaar, 2002). I.e., the data did not show both peakedness and extreme asymmetry, thereby validating the adequacy of the dataset for nonparametric item analysis.

Table 1

Descriptive Statistics for ETCS Subscales

Subscale	Mean	SD	Skewness	Kurtosis
Collaborative Practice (CP)	3.89	0.84	-0.30	-0.25
Professional Support & Mentorship (PSM)	3.78	0.95	-0.20	-0.10
Shared Professional Growth (SPG)	3.94	0.77	-0.15	-0.30

Overall, the findings demonstrate that SPG and CP are the strongest dimensions indicating an active level of participation in collaborative learning and work practices. PSM has somewhat lower ratings but remains in a generally positive tendency in coding, which indicates an overall positive perceived experience of mentorship and professional support. Therefore, these findings provide a solid empirical foundation for additional psychometric validation and confirm the existence of a multidimensional aspect of the ETCS.

5.2. Mokken Scale Analysis

To analyze the internal structure and dimensionality of the ETCS, Mokken Scale Analysis (MSA) was performed with the "Mokken" package in R. MSA is a nonparametric alternative to item response theory (IRT) that yields scalability coefficient estimates to decide if a group of items scales cumulatively to form a unidimensional scale (Mokken, 1971; Sijtsma & Molenaar, 2002).

5.2.1 Scalability Coefficients

Loevinger's H coefficients were also estimated at item-pair (H_{ij}), item (H_i), and the entire scale level (H). They are shown in Table 2. Based on usual criteria (i.e., $H < 0.30$ = poor; $0.30-0.39$ = fair; $0.40-0.49$ = good; $H \geq 0.50$ = excellent) (Baghaei & Effatpanah, 2024; Kianinezhad & Kianinezhad, 2025; Sijtsma & Molenaar, 2002) all

subscales and the total scale had good scalability. That is, each group of items in aggregate was measuring a unidimensional construct. Individual item scalability values (Hi) were also consistently greater than 0.48, which means that all the items had a significant contribution to their respective subscales.

Table 2
Mokken Scalability Coefficients for ETCS Subscales and Total Scale

Scale/Subscale	H (Total)	Hi Range	No. of Items
Collaborative Practice (CP)	0.52	0.48–0.59	10
Professional Support & Mentorship (PSM)	0.55	0.50–0.61	10
Shared Professional Growth (SPG)	0.57	0.53–0.64	10
Overall ETCS	0.56	0.48–0.64	30

As can be viewed in Table 2, all three subscales achieved an H -score $\geq .50$, showing strong scalability. This means that the items within each subscale created a coherent cumulative measurement of collegiality. The ETCS in its entirety achieved an H -score of .56, confirming that the total instrument achieved a strong, unidimensional construct.

5.2.2 Dimensionality and Assumption Testing

To establish the structural validity of the EFL Teacher Collegiality Scale (ETCS), Mokken Scale Analysis (MSA) was conducted with the help of the Mokken package in R (van der Ark, 2007). Automated Item Selection Procedure (AISP) was able to sort items into three theoretically coherent subscales, i.e., collaborative practice, professional support & mentorship, and shared professional growth, without proposing item deletion. Such a finding helps confirm the content validity and theoretical cohesion of the instrument (Lieberman & Miller, 1999; Sijtsma & Molenaar, 2002; van Schuur, 2003). Two of the MSA's fundamental assumptions were also verified. First, the monotonicity assumption was closely met for all items, ensuring that the probability of endorsement on an item enhanced monotonically as levels of the latent trait (teacher collegiality) grew higher (Sijtsma & van der Ark, 2017). Second, the Invariant Item Ordering (IIO) assumption was maintained across all subscales, suggesting that relative item difficulty was constant across varying respondent ability levels and as a result, confirming the existence of a hierarchical and unidimensional item structure (Boori et al., 2023; van Schuur, 2003).

In fact, the strong H -scores ($\geq .50$) across the sub-scales showed excellent scalability, and the reliability indices that reached or exceeded .90 indicated excellent internal consistency. Additionally, the average subscale means were at the upper middle range of the Likert scale, suggesting that teachers are engaging in collegial practices with frequency, and their reported satisfaction with collegiality was at both a consistent and substantial level. Taken as a whole, the findings show that the ETCS consists of internally consistent, scaleable, and theoretically sound subscales, and that it fulfills the statistical demands of strong nonparametric item response modeling.

5.2.3. Reliability Analysis

To estimate the internal consistency of the ETCS, four reliability coefficients for every subscale and for the entire scale were computed. These included: Cronbach's alpha (α) (Cronbach, 1951), used commonly in classical test theory; Guttman's Lambda-2 (λ_2)

(Guttman, 1945), a reliable alternative with the bias to provide higher and more precise reliability estimates; Mokken's scale reliability (ρ) (Mokken, 1971), applicable on nonparametric IRT models; and the Latent Class Reliability Coefficient (LCRC), measuring consistency between latent subpopulations. Also, according to Table 3, all the indices were above the general minimum of 0.70 (Jc, 1994), and they were primarily above 0.90, indicating high reliability.

According to Table 3, more specifically, Cronbach's alpha and Guttman's lambda-2 supported the internal consistency of all scales under the classical test theory assumption. Mokken's ρ indicated that the nonparametric reliability of all the scales was significant consistent with the scalability outcomes of the model. The LCRC illustrated that the scale is reliable even when permitting potential respondent heterogeneity. So, consistency across these four reliability estimates ensures that the scale is a statistically reliable measure, constantly and reliably measuring the exact constructs of collegiality without gross random error or unreliability within various respondent groups.

Table 3
Reliability Indices for ETCS Subscales and Total Scale

Scale/Subscale	A	$\lambda 2$	ρ	LCRC
Collaborative Practice (CP)	0.91	0.92	0.89	0.90
Professional Support & Mentorship (PSM)	0.93	0.94	0.92	0.93
Shared Professional Growth (SPG)	0.90	0.91	0.88	0.89
Total Scale	0.94	0.94	0.93	0.94

In general, the findings confirm that the EFL Teacher Collegiality Scale (ETCS) is a reliable and valid psychometric instrument for assessing collegiality among Iranian EFL teachers. Descriptive statistics confirmed the normal distribution of scores across items, supporting the appropriateness of the dataset for nonparametric item analysis. Structural validity was evidenced through AIS, Loevinger's H, monotonicity, and IIO, all of which demonstrated that the subscales were scalable and unidimensional, with no items requiring removal. Multiple reliability indices further complemented, rather than replaced, these validity findings, consistently yielding values above .90 for both the subscales and the total scale. That is, the ETCS stands as a theory-driven, psychometrically sound instrument for investigating collegiality in school contexts.

6. Discussion

The present study provides strong evidence that the EFL Teachers' Collegiality Scale (ETCS) is both a valid and reliable instrument for assessing collegiality in the Iranian EFL context. Evidence for structural validity was obtained through the Automated Item Selection Procedure (AIS), Loevinger's H coefficients, tests of monotonicity, and invariant item ordering (IIO). These procedures consistently demonstrated that the three dimensions of the ETCS, collaborative practice, professional support & mentorship, and shared professional growth, function as unidimensional and scalable constructs, confirming that the scale captures the theoretical underpinnings of collegiality.

Beyond validity, the ETCS also demonstrated robust reliability. Multiple indices of internal consistency, including Cronbach's α , Guttman's λ_2 , Molenaar-Sijtsma's ρ , and Latent Class Reliability Coefficient (LCRC), all exceeded .90 across subscales and the overall instrument. These high coefficients provide confidence that the ETCS items measure collegiality consistently, but they complement rather than substitute the validity evidence established through Mokken Scale Analysis. All in all, the findings establish the ETCS as a psychometrically sound tool for examining collegiality in EFL teaching contexts.

Monotonicity and invariant item ordering (IIO) testing also serves to enhance theoretical scale structure even more (Mokken, 1971). That is, as the latent trait of collegiality, the subjects will concur with higher scale values as the scale value increases, and the order in which items are examined based on difficulty or agreement does not differ from one respondent to another. This level of internal consistency is essential to use the instrument in varied EFL settings.

The ETCS was found to have high internal reliability on all indices of measurement. Cronbach's alpha (α), Guttman's lambda-2 (λ_2), Mokken's ρ , and Latent Class Reliability Coefficient (LCRC) all produced over 0.88, higher than the 0.70 cut-off typically applied in education studies and even greater than the 0.90 cutoff considered to be optimal for measurement instruments (Jc, 1994). These results establish that the scale is reliable under both theoretical (classical test theory) and empirical (IRT) frameworks.

SET was used as the framework theory here to describe how relationships are built and sustained among peers in learning communities. Social relationships, it is assumed by Blau (1964), operate on the principles of perceived gains and costs, and people sustain relationships if they find that the exchanges are equal and reciprocally rewarding to them. Collegial participation in teaching EFL is costly and enriching. Jarzabkowski (2002) and Kianinezhad (2024) point out that the costs are collaborative planning time, emotional risk in peer feedback, and the risk of opening one's pedagogy to others. In contrast, rewards far exceed these costs with access to instructional support, shared materials, emotional support, and pedagogical sensitivity.

The empirical data of this study validate the relevance of SET to the examination of collegiality. The three ETCS dimensions, collaborative practice, professional support & mentorship, and shared professional growth, all capture unique yet interrelated modes of mutual engagement. For instance, high levels of Professional Support & Mentorship describe an approach of low-cost, high-gain activities (e.g., offering support or sharing knowledge), which are the types of relational investment emphasized in SET.

In theory, the results contribute to social exchange theory by showing that collegial behaviors can be ordered in various ways based on cost-benefit logic. Further, this provides a mathematically testable mechanism by which micro-level interactions of teachers can be linked to macro-level development within a department. Empirically, the justification for the ETCS concurs with the notions explored in both of these domains. The mechanisms taken together should make one think of what can be explored further in terms of collegial behaviors. As such, we can establish a theoretical and empirical bridge in this intervention study that connects theory and theory of practice to the design of professional learning.

Also, the robustness of psychometric properties across all subscales indicates that these kinds of interactions are long-lasting, large in effect size, and overall viewed

positively by teaching staff. As one might expect from SET, lasting positive interaction will instill norms of trust, cooperation, and reciprocity into institutional cultures.

More importantly, this abstract concept can also be operationalized in practice. Schools can foster collegiality by strategically reducing perceived costs (e.g., allocating time for peer planning, formalizing mentorship roles) and enhancing perceived benefits (e.g., formal recognition, shared leadership opportunities). Such deliberate interventions may establish a self-sustaining pattern of collegial participation embedded within organizational culture, a process Blau (1964) describes as the institutionalization of social exchange.

The subjectively validated ETCS is highly promising as a diagnosis and intervention tool for a range of educational stakeholders. The tool offers evidence-based feedback to school administrators and leaders on the relational patterns of teaching faculty, with whom to identify strengths and development needs, e.g., deficiencies in mentorship or fragmented coordination. And thus, for policy-makers and teacher educators, the instrument provides a means of steering professional development initiatives on the basis of teachers' real-life departmental experience. The independent subscales enable interventions to be specifically directed for example, strengthening professional development arrangements in departments in which there is mentorship but not collaboration.

Because of its conciseness, readability, and local orientation, the instrument is well adapted to mass testing, ongoing surveillance, and institution-level comparative studies. While promising are the findings of this study, some shortcomings should be emphasized. First, the sample of respondents, even though as representative in teaching experience and background as could be targeted, was geographically and professionally limited to the Iranian setting of EFL. Generalizability is hence limited, and future researchers must conduct the study on other educational or cultural foundations. Second, the study only used self-reported data, which are prone to social desirability and self-bias by their definitions. To add validity, combining those findings with classroom observations, peer ratings, or performance measures would be useful. Finally, while the ETCS demonstrates strong psychometric properties, future research should address remaining gaps.

7. Conclusion

The ETCS profiles offer practical guidance for school leaders and teacher educators. They can help to determine the distribution of mentoring duties, create peer observation pairings, and assess the utility and impact of PLCs. The scale supports effective development by embedding contextually relevant perspectives to encourage collaborative, supportive as well as growing teaching approaches.

In short, the EFL Teacher Collegiality Scale (ETCS) demonstrates robust psychometric properties, a solid theoretical foundation, and clear practical utility. Its multidimensional structure covering collaborative practice, professional support & mentorship, and shared professional growth, enables a nuanced description of EFL teacher collegiality. Grounded in social exchange theory, the scale enhances interpretability and conceptual richness. Methodologically, it advances scale validation through a nonparametric item response procedure, contributing to rigorous instrument development practices. The ETCS provides a theory-based, actionable tool for capturing, understanding, and promoting professional collaboration among language

instructors. Future studies should also include measuring measurement invariance across institutions, using CFA and SEM for dimensional validation, measuring longitudinal responsivity, and including items measuring digital collegiality in hybrid and online realms.

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