Development of a students' satisfaction scale

Jamshid Ghasemi

Ilam University, Iran

Abstract

The present study aimed to investigate the factors, features, and variables that might affect EFL students' satisfaction. Despite the importance of this concept, no validated instrument was found to measure these constructs. To fill the gap, this study developed and validated a scale of EFL students' satisfaction. A 41-item questionnaire was developed and administered to 305 EFL students (171 females and 134 males). We ran Structural Equation Modeling (SEM) to analyze the collected data and test the path model of the study. The reliability and validity of the questionnaires were estimated using exploratory and confirmatory factor analyses. The results indicated acceptable goodness of fit indices (Chi-squared=1/779, $p < .001$, CFI = 0.947, TLI = 0.908, RMSEA= 0.048, SRMR = 0.043, AIC =16650 and BIC =17140). The findings of the study further showed that EFL students' satisfaction was highly sensitive to some of the subscales of the study and that under certain conditions often as the result of interplay between the components of the scale, the professional perceptions of the participants undergo severe changes. The findings of this study have implications for researchers, as well as language teachers and other practitioners in the field of education and teaching quality.

Keywords: Scale Development, Students' Satisfaction, Teaching Quality, Satisfaction, Students' Satisfaction Scale

Development and Validation of an EFL Students' Satisfaction Scale

In many countries, students are asked about their perceptions of teaching for the sake of making decisions about the further development of teaching practices on the basis of this feedback and the stability of this measurement of teaching quality is a prerequisite for the ability to generalize the results to other teaching situations (Gaertner & Brunner, 2018). Student perception is suitable for assessing the deep structure (The deep structure of teaching means that if a teacher is generally competent in, for example, classroom management, he or she can optimize the time on task for students in different lessons using different means, Gaertner & Brunner, 2018.), as students can judge the teaching based on their diverse experience, and unlike observers, they can assess the deep structure without using indicators of the surface. Students can answer very well how interesting, difficult, or understandable an instruction is in general (MET Project 2012).

Students experience their teachers every day and therefore may be an important source of information about the teaching qualities of their teachers (Ferguson & Danielson, 2014). Recent studies have indicated that student perceptions of teaching quality can provide reliable and valid information regarding both formative evaluation and research purposes (Burniske & Meibaum, 2012). To warrant that higher education institutions represent excellence in teaching and learning, an increasing number of surveys considering students' perceptions of teaching quality and learning experiences have been used in countries such as Australia and the UK (Grace et al. 2012; Webster et al. 2009). Empirical research has indicated the importance of students' perceptions of their learning in determining student satisfaction and teacher evaluations (Xiao & Wilkins, 2015).

Student satisfaction is defined as an emotional or cognitive response or reaction to the learning experience. Perceived teaching quality is defined as students' perception of the teaching enterprise,

and it is directed toward focal aspects of teaching and determined by student feedback questionnaires or personal interactions (Smimou & Dahl, 2011). According to Chu (1990), If the the contents and teaching arts are good then it is considered satisfactory. If contents are good and the lecture is attractive and satisfactory, the contents include new developments or practices in the field, it can be considered much more satisfactory. Students are considered satisfied with the quality of their teaching when the learning outcomes and expected standards are apparent to them, when the teaching helps them to learn, when they can develop valuable graduate attributes, when the assessment allows them to demonstrate what they have understood, when they can see the relevance of their subject to their level, when staff is responsive to their feedback, when their prior learning prepares them well, when they can understand their teacher, and when the faculty infrastructure seems to be supportive (Calvo et al, 2010). Based on the results of his structural model, Fouskakis et al. (2015) conclude that students' satisfaction mainly depends on the teacher's ability, which is dependent on the instructor's course organization, communicability, subject knowledge, and on the teacher's behavior which mostly depends on the manifest variable respect for students. Roman (2014) in a study stresses the "positive factors" that lead to improving the educational process and implicitly increasing students' satisfaction with their teaching activity. The positive factors are high level of teacher's professional training, ways of conducting courses involving students in teaching, implementation of practical activities, application of efficient teaching strategies, the benevolent attitude of teachers and patience to explain, efficient communication, elevated speech, respect for students, the teacher should surprise students with something new and interesting to captivate them, fair assessment and friendly attitude of the teacher.

This study intends to develop and validate a scale of EFL Students' Satisfaction with the teaching quality. After studying the related literature and different models, scales, and definitions of quality, teacher quality, and teaching quality, a recent model by Ghasemi (2022), consisting of exploratory and confirmatory analyses that was actually employed to test the construct validity of the proposed four factors, i.e. knowledge, personality, skills, and qualifications became the main focus of this study. This teaching quality scale (TQS) was noticed because of its high reliability and validity and also the recency and the similarity in the aim, objective, and methodology with this study. The reliability calculated for the TQS was a satisfactory Cronbach's Alpha of .923 and McDonald's Omega of 0.934 and the results showed a reasonable factor structure and a desirable convergent validity and a rescannable degree of factorial validity based on the good model fit and factor pattern loadings.

The results of this study may have contributions to the theory and the practice of language teaching and particularly to EFL teaching and can provide educators with a large landscape of the area of EFL students' satisfaction with teaching and teachers' quality. This study also helps EFL teachers to be more aware of their knowledge, skills, and behaviors and their effect on EFL learners' satisfaction and language learning.

Literature Review

Although the relationship between students' perceptions of the quality of teaching and student satisfaction may seem self-evident, the interaction between these concepts and related methods of assessment is rarely examined (Smimou & Dahl, 2011). Students' satisfaction has emerged as one such measurement of quality, being identified as one of the many factors which determine the effectiveness of an academic program (Albarrak et al, 2013). Possible impacts of Students'

satisfaction on improving schools, increasing teaching quality, and improving the quality of student learning have led researchers and policymakers to pay much more attention to this issue and conduct much more research in this area (e.g. Arubayi, 2009; Duque, 2014; Kim et al., 2012; Zineldin et al., 2011; Martínez-Caro & Bolarín, 2011; Kilgour et al., 2016).

Guolla (1999) investigated the impact of multiple teaching quality factors on course satisfaction by applying established theories from customer satisfaction and educational psychology research to a sample of MBA and Undergraduate students from multiple sections of an introductory marketing course. The results indicate that the extent to which students felt they encountered a valuable teaching experience was strongly related to course satisfaction. However, in a further study, Calvo et al. (2010) conducted research considering factors affecting students' experiences and satisfaction with teaching quality. That study described used 45,467 responses from engineering students to a standardized student feedback questionnaire over 7 years, to explore factors associated with variation in students' learning experiences, including their experience of the quality of their teaching and their overall satisfaction with their subjects. Their analysis showed that of the factors considered, year of study, class size, and coordinators' professional development significantly contribute to students' satisfaction. In a narrower work, Roman (2014), focusing on the possibility to increase the quality of teaching, carried out a study on determining students' satisfaction with teaching quality. This research is concentrated on teaching quality development by determining the motivating factors that lead to improved teaching and to learn the factors that lead to a decrease in the level of student involvement in teaching and scientific activities. The results of the study identify students' degree of satisfaction with the educational activities offered by the university and aspects that students consider to be important for their development. Xiao & Wilkins (2015) conducted a study in a Chinese context with the purpose of examining the effects

of lecturer commitment on student perceptions of teaching quality and student satisfaction. They found that lecturer commitment to students' academic achievement and lecturer commitment to the social integration of students are both positively related to student satisfaction which implies the important role of the teacher and teaching quality in students' satisfaction and achievement. In another study by Yin et al. (2015) the researchers aimed to examine Chinese undergraduate students' perceptions of teaching quality and the effects on their approaches to studying and course satisfaction. The study revealed the desirable effects of clear goals and standards, an emphasis on independence, generic skills, and an appropriate workload on students' approaches to studying and course satisfaction.

Students' perception and evaluation of teaching quality in higher education have been also taken care of in recent research. Üstünlüoğlu (2016) performed a case study considering teaching quality in higher education in Turkey and Slovakia. Her study aimed to investigate the perceptions of both students and lecturers on teaching in higher education. The results indicated a difference between students' and lecturers' perceptions regardless of country, highlighting a discrepancy in views on the pedagogical competence of lecturers. Spooren et al. (2007) developed a theory-based and thoroughly validated evaluation instrument that is based on both educational theory and empirical data. The theoretical constructions of Spooren's teaching quality scale are presentation skills, the value of the course, and clarity of objectives. Although this scale is not comprehensive enough and does not include teachers' characteristics and personalities, the results underline the value of the use of a scaling technique in students' evaluation of teacher performance. Ghasemi (2022) described the process of development and validation of a reliable scale for measuring teacher quality in an EFL context which was employed to test the construct validity of four factors, i.e. knowledge, personality, skills, and qualifications, and also provides a large landscape of the

area of EFL teaching quality. Dunrong & Fan (2009) with the intention of improvement of teaching quality conducted a study with the aim to build up a scientific system of student evaluation of teaching, and drawing on advanced experiences from abroad so as to improve the system of student evaluation of teaching and perfect the teaching quality assurance system. In a study by Johnson & Chen (2006), it was concluded that residents and faculty contribute important and different aspects of teaching experiences for medical students in ambulatory gynecology. This study was undertaken to compare teaching quality between obstetrics/gynecology residents and faculty preceptors in ambulatory gynecology as determined by medical student evaluation. However, numerous empirical investigations demonstrate equivocal and often contradictory findings regarding the relationship between attendance and various markers of student achievement (Burns & Ludlow, 2005). their investigation extends this research by exploring the utility of student ratings of the need to attend class in predicting their perceptions of teaching excellence after controlling for class size, instructor availability, and small-group interactions.

Methodology

This scale is a modification to the scale (TQS) developed by Ghasemi (2022) in which through studying the related literature, a model is developed based on existing definitions of teaching quality and offered models and scales of teaching quality measurement in the literature. The developed model is an EFL teacher teaching quality scale (TQS) that led us to the identification of the main sources that influence teaching quality and the key factors affecting teaching quality and students' satisfaction. Therefore, we modified the TQS by changing the voice of the questionnaire, simplification of the professional and technical terms, and removing items that could not be monitored and assessed from the students' point of view, and incorporating the improved constructs into the Students' Satisfaction Scale (SSS). Further, these aspects and their subscales

were identified and confirmed in the content validity phase. The constructs and sub-domains of that four factors, i.e. knowledge, personality, skills, and characteristics have been enumerated by Ghasemi (2022).

Participants

The current study encompassed 305 EFL students (171 females and 134 males) from Ilam and Kohgiluye, Iran participated in the study. The students with educational levels of A.A., B.A., and M.A. in English Literature, Translation, Linguistics, and Teaching English as a Foreign Language were the participants of this study. Participants of the study were selected based on the stratified sampling technique in which different smaller parts of the population, to wit strata, were selected to participate in the project. They were ensured about their privacy concerns.

Instruments

In order for the content validity of the scale, a "Peer-reviewed" method was chosen and a group of 5 experts was asked humbly to investigate carefully the items to present evidence of the EFL Students' Satisfaction Scale (SSS) content validity. They rated the appropriateness of the items influencing teacher quality on a three-point scale (1=suitable, 2=marginally suitable, 3=very suitable) and classified them into possible categories. Then, their ratings were analyzed to ensure which items remained on the scale. Based on the reviewers' comments, the researchers rephrased the items with ratings under 3. In order to apply the next validation (i.e. exploratory & confirmatory factor analyses) of the scale, several assertions for the explanation of the items were provided in the form of a Likert-type questionnaire. Afterward, Cronbach's Alpha was calculated to evaluate the reliability of the scale. Its reliability value was 94.7% which indicated a high level of internal consistency.

Procedure of Data Collection

After finalizing the questionnaires, they were distributed among EFL students in Ilam and Kohgiluyeh, Iran. Under the influence of health care protocols and limited contact and communication, we had to distribute and collect the questionnaires only through online forms. Participants were in contact through different ways with the researchers and it was explained how to complete the questionnaires. Finally, it took two months to distribute and collect the questionnaires. From distributed questionnaires, only 305 completely filled questionnaires were downloadable and they formed the basis of data analysis using Statistical Package for Social Science (SPSS) and jamovi.

Data Analysis

In order to analyze the collected data sets, descriptive and inferential statistics were utilized. Descriptive statistics were performed to calculate the frequency and percentage of each section of the questionnaire. Our data analysis included two phases: exploratory factor analysis and confirmatory factor analysis. We ran SPSS version 26, Amos version 20, and jamovi software for analyzing our data. The first phase, the exploratory factor analysis, was used to determine the appropriate number of variables in a study by using some statistics. The second phase, confirmatory factor analysis, through the investigation of all the associations among main scales and their sub-scales, tries to confirm or validate the model using goodness of fit indices. The statistics used to examine the model fit for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were chi-square statistic, Comparative Fit Index (CFI), Tucker Lewis index (TLI), and the Root Mean Square Error of Approximation (RMSEA), as well as Standardized Root Mean Square Residual (SRMR), Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC). In general, Chi-squared statistics of less than 3, with CFI and TLI greater than.90

and RMSEA and SRMR of Less than.0.6 and 0.8 respectively are considered as an acceptable model fit (Hu & Bentler, 1999). The EFA descriptive analysis of EFL students' satisfaction was carried out with SPSS version 26, whereas CFA and model evaluation was conducted using jamovi software version 1.2.27 and Amos version 20.

Results

Results of Exploratory Factor Analysis

In this study, at first, Exploratory Factor Analysis (EPA) based on Maximum likelihood with Variamax rotation was performed on 41 items using SPSS version 26. Items loaded heavily on more than one factor. If an item's highest factor loading was greater than a priori-determined cutoff value, the item was retained. Also setting a cutoff at .40, this level did not result in any item removal in our sample loaded. To address the issue of the suitability of the data, and the strength of the inter-correlations among the items, we checked the Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO). This value should be over 0.6. Bartlett's Test of Sphericity value should also be considered that is the Sig value should be .05 or smaller. As it is clear from table 1 in this study our sample is appropriate for factor analysis because the KMO value is 0.747 (it should be above 0.6) and Bartlett's Test of Sphericity (chi-square = 14339.403, df = 820, p = .000) were factorable ($p<0.05$).

Table 1

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.747

Bartlett's Test of Sphericity	Approx. Chi-Square	14339.403
	df	820
	Sig.	.000

As is shown in Table 2, four factors were identified as underlying latent constructs from 41 items based on parallel analysis accounting for 60.64% of the total variance in the data. These factors included the 4 dimensions used to measure students' satisfaction.

Table 2

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
C	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.307	34.895	34.895	14.307	34.895	34.895
2	5.520	13.465	48.359	5.520	13.465	48.359
3	2.825	6.890	55.249	2.825	6.890	55.249
4	2.211	5.392	60.642	2.211	5.392	60.642

Results of Confirmatory Factor Analysis

In the next step, the Confirmatory Factor Analysis (CFA) was conducted using jamovi software version 1.2.27. The maximum likelihood method was used to estimate the parameter. The results of the CFA analyses indicated a relatively adequate good model fit. The results indicated an overall good model

fit; Chi-squared=1/779, p < .001, CFI = 0.947, TLI = 0.908, RMSEA= 0.048, SRMR =0.043, AIC =16650 and BIC =17140.

Figure 1

Fitted CFA model

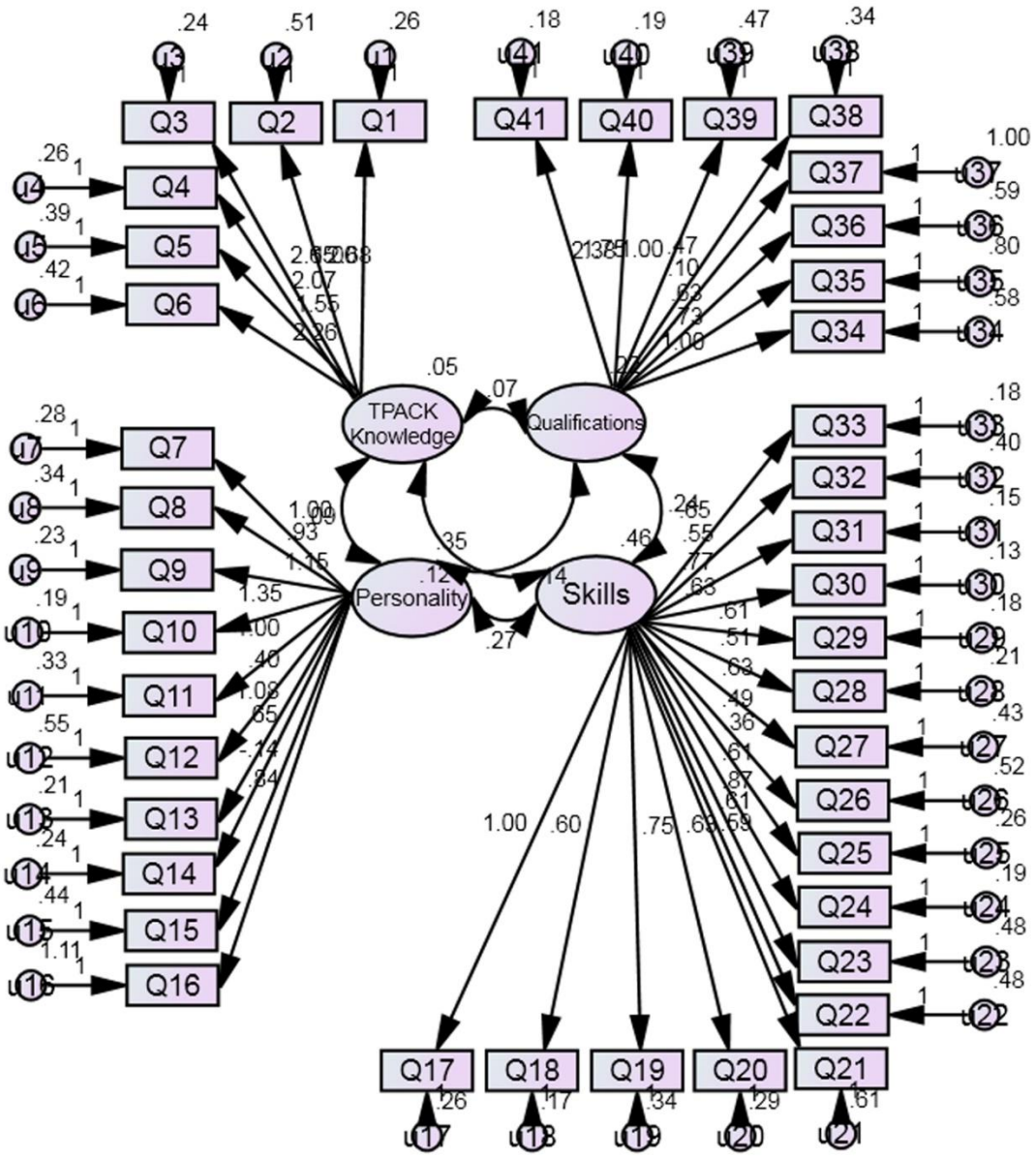

Table 3

Component Correlation Matrix

C	1	2	3	4	5	6	7	8	9
1	1.000								
2	.349	1.000							
3	.246	.240	1.000						
4	.111	.295	.228	1.000					
5	.275	.171	.293	.244	1.000				
6	.299	.299	.344	.314	.439	1.000			
7	.197	.232	.308	.158	.326	.267	1.000		
8	.529	.378	.272	.240	.256	.260	.234	1.000	
9	.095	.193	.062	-.223	-.202	-.055	.113	.092	1.000

Table 4

Model Fit Measures

				RMSEA 90% CI			
CFI	TLI	SRMR	RMSEA	Lower	Upper	AIC	BIC
0.947	0.908	0.043	0.048	0.068	0.077	16500	17140

Table 5

Factor Covariance

		Estimate	SE	Z	p
TPACK Knowledge	TPACK Knowledge	1.000 [a]			
	Personality	0.716	0.0405	17.66	< .001
	Skills	0.818	0.0303	27.03	< .001
	Qualifications	0.713	0.0393	18.16	< .001
Personality	Personality	1.000 [a]			
	Skills	0.673	0.0384	17.51	< .001
	Qualifications	0.495	0.0496	9.98	< .001
Skills	Skills	1.000 [a]			
	Qualifications	0.735	0.0324	22.71	< .001
Qualifications	Qualifications	1.000 [a]			

[a] fixed parameter

Results of Reliability Analysis of SSS

Using jamovi for the reliability analysis of our items, which is indicated in table 6, we have the reliability calculated for the questionnaire with a satisfactory Cronbach's Alpha of .947 and McDonald's Omega of 0.951. As we already know, a Cronbach's Alpha of more than 0.70 and as

a general guideline, for McDonald's Omega, a threshold value of .70 is for research purposes and .90 for clinical or important decisions. Therefore, they are acceptable and considered reliable.

Table 6

Scale Reliability Statistics

	sd	Cronbach's α	McDonald's ω
scale	0.448	0.947	0.951

Discussion and Conclusion

Students' satisfaction is one such measurement of quality, being identified as one of the many factors which determine the effectiveness of an academic program (Albarrak et al, 2013) and is positively related to student's academic achievement. Recent research has indicated the importance of student's perceptions of their learning and teaching quality in determining student satisfaction (Xiao & Wilkins, 2015). However, there is no domain-specific scale available to measure different aspects of student's satisfaction. Therefore, in response to the necessity for further systematic research on students' satisfaction with teaching quality, the present study aimed to address the research gap relating to the need for a domain-specific scale to measure students' satisfaction. To this end, a valid and reliable measure called SSS was developed based on the quality constructs and the scale developed by Ghasemi (2022) and went through rigorous exploratory and confirmatory factor analyses.

The SSS developed in this study measures four factors determining students' satisfaction with teaching and teacher quality, namely, TPACK knowledge, personality, skills, and qualifications. TPACK is a framework for introducing the relationships and complexities between technology,

pedagogy, and content knowledge (Mishra & Koehler, 2006). This aspect which is assessed by 6 items in this scale, brings an intuitive understanding of teaching content with appropriate pedagogical methods and technologies at the intersection of these three types of knowledge. At the ideal level, in which the professional perceptions of the participants undergo severe changes, teachers have an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies. This interplay between the sub-dimensions of these components is responsible for heavy loadings (34.895 percent of the whole) in the factor loading in table 2. The present study also showed teacher's personality, which is related to academic and professional success, described with five sub-dimensions of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Djigic et al., 2014). It is another separate dimension of students' satisfaction with 10 items but unlike the TPACK knowledge, there is no interchange between different sub-scales of this component. Another dimension of students' satisfaction in SSS with 17 items, is related to professional skills which include Leadership Skills, Critical & Reflective Thinking Skills, Communicative & Verbal Skills, Creativity Skills, and Mindfulness which is comprised of four general domains including planning and organization, teaching mindfulness, guiding mindfulness practices, and management of the learning environment (Broderick et al., 2018). Teachers' professional skills showed the most factor covariance with the other three components according to table 5. Improving teachers' professional skills, defined as the preparation of teaching and learning, content knowledge, teaching experience, and transmitting the information to the students in an understandable manner (Darling-Hammond et.al 2002) is the ultimate goal of professional development (Cleaver et.al 2020). Finally, qualifications, including (a) teacher behaviors, practices, and beliefs; (b) certification status; (c) experience; (d) preparation;

and (e) ethical principles are measured by 8 items. *Teacher behaviors, practices, and beliefs* included what teachers do in the classroom, for example, questioning strategies, instructional equity, and beliefs about students' learning, such as beliefs about who can and cannot learn. *Certification* describes teachers' certification status (including whether they are emergency, provisionally, or fully certified) and whether a teacher is certified in the field in which they are teaching. The total number of years an educator has been teaching and/or the number of years a teacher has taught a particular grade level or field of study is referred to as *Experience*. The morality of teachers, as an important aspect of teacher quality, is the teachers' *professional ethics* (Ren, 2009).

Results suggested that the Students' Satisfaction Scale had a reasonable factor structure, high internal reliability, and desirable convergent and discriminate validity. The results of the EFA indicated that the instrument had a rescannable degree of factorial validity based on the good model fit and factor pattern loadings. Generally, the results revealed large factor pattern loadings. The result of CFA also revealed good factorial validity. Each item was highly correlated with its corresponding factor and not with the other factor (Chi-squared=1/779, $p < .001$, CFI = 0.947, TLI = 0.908, RMSEA= 0.048, SRMR = 0.043, AIC =16650 and BIC =17140). Accordingly, the results of EFA and CFA confirmed the four factors model of the Students' Satisfaction Scale in the Iranian EFL context. Thus, one of the strengths of the developed instrument in the present study is that it reflects an educational and Iranian context.

The result of this study confirmed that the Iranian EFL teachers, as the center of language teaching, should improve themselves in terms of knowledge, personality, skills, and qualifications and subsequently, they can construct and re-construct their identity to attain the highest level of effectiveness in language teaching from the student's point of view. Furthermore, in order to have

the best performance in foreign language contexts, participating in professional development programs related to the profession, and acquiring professional certificates are important for teachers. Also in order to increase teachers' effectiveness, they should be aware of their strengths as well as their weaknesses and try to improve themselves and expand their skills in order to maximize their teaching quality and students' satisfaction. With regard to the teacher quality scale, the next implication of this study is the availability of a valid and reliable scale to measure teacher quality for educational researchers, practitioners, testers, and teachers.

The construction of a valid and reliable scale requires systematic research, in which both the literature and empirical data play an important role; however, this type of preliminary research does not yet seem to be popular (Spooren et al., 2007). This is the strength of our scale and ensures those who are concerned about the reliability, validity, and thus the usefulness of this teacher teaching quality scale.

The process of validating an assessment instrument is a never-ending task. So, future research will need to be performed in order to establish the validity of the teaching quality assessment questionnaire we constructed and studied.

Limitations and Further Research

One limitation of this study is its sample size. The study was conducted in two provinces namely, Ilam and Kohgiluye, Iran. Therefore, the sample size may limit the generalizability of our results. With regard to the pandemic and under the influence of health care protocols and limited contact and communication, we had to distribute and collect the questionnaires just through online forms. Also considering the large number of questions in the questionnaire, some teachers may

tend to move through the questionnaire too quickly and carelessly in order to complete the questionnaires faster.

To compensate for the limitations of this study, similar studies can be conducted in more provinces, or investigate how other factors like age, gender, and experience level influence teachers' quality. Also, it would be a valuable topic for future researchers to investigate the potential relationship between the variables of the current study with students' achievement and learning.

References

Albarrak, A., Mohammed, R., Abalhassan, M. & Almutairi, N. (2013). Academic satisfaction among traditional and problem based learning medical students. A comparative study. Saudi medical journal. 34. 1179-1188.

Arubayi, D.O. (2009) Home Economics Students' Satisfaction or Dissatisfaction with Learning Experiences in Clothing and Textiles in Tertiary Institutions, Studies on Home and Community Science, 3:2, 87-90, DOI: 10.1080/09737189.2009.11885281

Broderick, P., Frank, J., Berrena, E., Schussler, D., Kohler, K., Mitra, J., Khan, L., Levitan, J., Mahfouz, J., Shields, L. & Greenberg, M. (2018). Evaluating the Quality of Mindfulness Instruction Delivered in School Settings: Development and Validation of a Teacher Quality Observational Rating Scale. *Mindfulness*, 10. 10.1007/s12671-018-0944-x.

Burns, S. & Ludlow, L. (2006). Understanding Student Evaluations of Teaching Quality: The Contributions of Class Attendance. Journal of Personnel Evaluation in Education. 18. 127-138. 10.1007/s11092-006-9002-7.

Burniske, J., & Meibaum, D. L. (2012). The use of student perceptual data as a measure of teaching effectiveness. Retrieved from the Texas Comprehensive Center website. http://txcc.sedl.org/ resources/briefs/number_8/index.php

Calvo, R. A., Markauskaite, L. & Trigwell, K. (2010). Factors Affecting Students' Experiences and Satisfaction about Teaching Quality in Engineering, Australasian Journal of Engineering Education, 16:2, 139-148

Chu. F. (1990). Fuzzy Sets and Systems 37 (1990) 1-11, Southeast University, Nanjing, China

Cleaver, S., Detrich, R., States, J. & Keyworth, R. (2020). Overview of Teacher Professional Development (Inservice). Oakland, CA: The Wing Institute. https://www.winginstitute.org/quality-teachers-in-service.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation: How well do different pathways prepare teachers to teach?. Journal of Teacher Education, 53(4), 286-302.

Djigic, G., Stojiljković, S. & Dosković, M. (2014). Basic Personality Dimensions and Teachers' Self-efficacy. *Procedia - Social and Behavioral Sciences*, 112. 593-602. 10.1016/j.sbspro.2014.01.1206.

Ferguson, R. F., & Danielson, C. (2014). How framework for teaching and Tripod 7Cs evidence distinguish key components of effective teaching. In T. J. Kane, K. A. Kerr, & R. C. Pianta (Eds.), Designing teacher evaluation systems (pp. 98–143). San Francisco, CA: Jossey-Bass.

Dunrong, B. & Fan, M. (2009). On Student Evaluation of Teaching and Improvement of the Teaching Quality Assurance System at Higher Education Institutions. Chinese Education & Society. 42. 100-115. 10.2753/CED1061-1932420212.

Duque, L. C. (2014) A framework for analysing higher education performance: students' satisfaction, perceived learning outcomes, and dropout intentions, Total Quality Management & Business Excellence, 25:1-2, 1-21, DOI: 10.1080/14783363.2013.807677

Fouskakis, D., Petrakos, D. & Vavouras, I. (2015). A Bayesian hierarchical model for comparative evaluation of teaching quality indicators in higher education, Journal of Applied Statistics, DOI: 10.1080/02664763.2015.1054793

Gaertner, H., & Brunner, M. (2018). Once good teaching, always good teaching? The differential stability of student perceptions of teaching quality. Educ Asse Eval Acc 30, 159–182 (2018). https://doi.org/10.1007/s11092-018-9277-5

Ghasemi, J. (2022). Development and validation of an EFL teacher teaching quality scale. *International Journal of Quality in Education, 7 (1), 1-23*. Retrieved from https://dergipark.org.tr/en/pub/ijqe/issue/73703/1214976

Grace, G. G., Massay, L. & Udoka, S. J. (1998). Total quality systems: using a multidisciplinary preparation course for teaching quality improvement. Comput. Ind. Eng. 35, 1–2 (Oct., 1998), 249–253. DOI:https://doi.org/10.1016/S0360-8352(98)00076-X

Guolla, M. (1999). Assessing the Teaching Quality to Student Satisfaction Relationship: Applied Customer Satisfaction Research in the Classroom, Journal of Marketing Theory and Practice, 7:3, 87-97, DOI: 10.1080/10696679.1999.11501843

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structureanalysis: conventional criteria versus new alternatives. Structural EquatModeling, 6, 1e55

Johnson, N. & Chen, J. (2006). Medical student evaluation of teaching quality between obstetrics and gynecology residents and faculty as clinical preceptors in ambulatory gynecology. American journal of obstetrics and gynecology. 195. 1479-83. 10.1016/j.ajog.2006.05.038.

Kilgour, J. M., Grundy, L. & Monrouxe, L.V. (2016). A Rapid Review of the Factors Affecting Healthcare Students' Satisfaction with Small Group, Active Learning Methods, Teaching and Learning in Medicine, 28:1, 15-25, DOI: 10.1080/10401334.2015.1107484

Kim, H., Lee, S. & Yuan, J. (2012). Assessing College Students' Satisfaction with University Foodservice. Journal of Foodservice Business Research. 15. 39-48. 10.1080/15378020.2011.624048.

Martínez-Caro, E. & Bolarín, F. (2011). Factors affecting students' satisfaction in engineering disciplines: traditional vs. blended approaches. European Journal of Engineering Education. 36. 473-483. 10.1080/03043797.2011.619647.

MET Project. (2012). Asking students about teaching: student perception surveys and their implementation. Seattle: Bill & Melinda Gates Foundation.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. *Teachers College Record, 108*(6), 1017–1054.

Ren, W. (2009). Reinforcement on Teachers' Morality Construction --- An Eternal Subject in Educational Development. *Asian Culture and History*, 1. 10.5539/achv1n2p180.

Roman, I. (2014). Qualitative Methods for Determining Students' Satisfaction with Teaching Quality. Procedia - Social and Behavioral Sciences 149 (2014) 825 – 830

Smimou, K. & Dahl, D. (2011). On the Relationship Between Students' Perceptions of Teaching Quality, Methods of Assessment, and Satisfaction. Journal of Education for Business. 87. 10.1080/08832323.2010.550339.

Spooren, P., Mortelmans, D. & Denekens, J. (2007). Student evaluation of teaching quality in higher education: development of an instrument based on 10 Likert-scales, Assessment & Evaluation in Higher Education, 32:6, 667-679, DOI: 10.1080/02602930601117191

Üstünlüoğlu, E. (2016). Teaching quality matters in higher education: a case study from Turkey and Slovakia, Teachers and Teaching

Webster, R. J., Chan, W. S., Prosser, M. T., & Watkins, D. (2009). Undergraduates' learning experience and learning process: Quantitative evidence from the East. Higher Education, 58(3), 375–386.

Xiao, J. & Wilkins, S. (2015). The effects of lecturer commitment on student perceptions of teaching quality and student satisfaction in Chinese higher education, Journal of Higher Education Policy and Management, 37:1, 98-110, DOI: 10.1080/1360080X.2014.992092.

Yin, H., Wang, W. & Han, J. (2015). Chinese undergraduates' perceptions of teaching quality and the effects on approaches to studying and course satisfaction. Higher Education. 71. 39-57. 10.1007/s10734-015-9887-5.

Zineldin, M., Akdag, H. & Vasicheva, V. (2011). Assessing quality in higher education: new criteria for evaluating students' satisfaction, Quality in Higher Education, 17:2, 231-243