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Research Paper

A Study of Exploratory Factor Analytic Model: Identifying Optimal Number of Factors Affecting Reflection-for-action Scale

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Abstract
This study aimed at developing and designing a new model and instrument to explore attitudes of Iranian EFL Teachers towards reflection-for-action through their teaching. In so doing, the researchers followed several rigorous steps including extensive literature review, content selection, item generation, designing the rating scales and personal information part, item revision, and detecting factor structure. An initial draft of the questionnaire consisting of ten dimensions along with 49 items, investigating teachers' attitudes towards the components of reflection-for-action scale based on the literature and interview with a panel of experts. Then, it was distributed to a group of 150 Iranian EFL teachers to refine it more. Finally, Exploratory factor analysis (EFA) of the obtained data revealed that the questionnaire consisted of a seven-factor structure including Academic Qualification as the (first factor), Experience (second factor), Professional Development (third factor), Collaboration (fourth factor), Perception (fifth factor), Efficacy (sixth factor), Motivation (seventh factor).

Keywords: *Exploratory factor analysis, Factor extraction, Reflection-for-action, Suitability of data*

بازنگری مفهومی تامل برای عمل در محیط یادگیری زبان انگلیسی به عنوان زبان خارجی در ایران
تامل یکی از مولفه های کلیدی در رشد معلم ها است که با توجه به آن میتوانند به درکی از دانش تدریس، ارتباط تئوری و عمل و توسعه مهارت های تدریس برسند. هدف از انجام این تحقیق بررسی ساختار اساسی مواردی است که تشکیل دهنده "تامل برای عمل " در محیط یادگیری زبان انگلیسی به عنوان زبان خارجی در ایران است. به منظور ارائه چارچوب برای انجام تحقیق و مشخص کردن مولفه های "تامل برای عمل" ، این تحقیق به توسعه و اعتبارسنجی یک پرسشنامه در این رابطه پرداخته است. در این راستا، پس از مطالعه جامع از پیشینه تحقیق و انجام مصاحبه با متخصصان این حوزه، ده مولفه شناسایی گردید. سپس، نسخه اولیه پرسشنامه که شامل 49 گویه بود توسط 200 معلم که در موسسات اموزش زبان انگلیسی و دانشگاه های متعدد در ایران مشغول به کار بودند، مورد ارزیابی آزمایشی قرار گرفت. نتیجه به دست آمده بر اساس تحلیل عامل اکتشافی مورد بررسی قرار گرفت و منجر به ایجاد یک پرسشنامه 38 گویه ای با قابلیت اطمینان و اعتبار قوی شد. نتایج همچنین نشان داد که پرسشنامه دارای یک ساختار هفت عاملی شامل همکاری، انگیزش، ادراک، تجربه، صلاحیت دانشگاهی، پیشرفت حرفه‌ای و اثربخشی میباشد. در نتیجه، تحلیل عامل تایدی با ۲۰۰ معلم ایرانی دیگر برای بررسی تناسب مدل پیشنهادی انجام شد. تیجه تحلیل عامل تاییدی نیز حاکی از آن است که این مدل دارای سطح رضایت‌بخشی از تناسب است که نشان می‌دهد این هفت عامل ناشی از واریانس تصادفی در پاسخ‌های دانشجویان نبوده است .در نهایت، نتایج آماری مورد بحث قرار گرفتد و مفاهیم و کاربردهای تحقیق ارائه گردید.
واژگان کلیدی :تحلیل عاملی تاییدی، تحلیل عاملی اکتشافی، تامل برای عمل (تامل در عمل و تامل بر عمل).

Introduction

After the emergence of the post-method era in language teaching in recent years, the reflective practice of teaching also has been emphasized by many researchers. Reflective teaching is defined as an innovative approach in which professional EFL teachers try to evaluate and reflect on their own teaching practice and, criticize it and accept the others' criticism (Farrell, 2013). As such, Black (2015) defines Reflective practice as "a strategy to self-evaluate and make judgments on knowledge, capacity, competence, and confidence as a teacher" (p.72). He also accentuates that teaching must be a practice embracing a process of reasoning, hypothesizing, investigation, testing, and assessment.

Reflectivity has a strong and direct correlation with effectiveness in teaching which makes teachers constantly findings their flaws, try to analyze them, and diminish them to achieve success in teaching and as a result in learner's learning (Zafar Iqbal, 2017). Indeed, reflection involves thinking about past or ongoing experiences of events, situations, or actions so as to make sense of them, potentially with a view to inform future choices, decisions, or actions. Teachers who explore their own teaching through reflection develop changes in attitudes and awareness which can benefit their professional growth (Bett, 2016). Through reflection, learners reviewed and revisited the knowledge they had learned, explored the depth of the knowledge, and reinforced the knowledge. Furthermore, Reflection allows learners to step back to review the whole process of learning and to recognize the value of the knowledge holistically, not just fragments of knowledge.

Reflectivity is an important feature in constructing and establishing of professional growth of language teachers in different ways. Due to the complicated nature of language teaching education, professional teachers must be aware of ways in order to deal with the problems and difficulties throughout their teaching path. They need to have appropriate techniques to question and reflect upon their own professional stance and to critically seek out practical solutions to the questions that will emerge throughout their profession as a language teacher (Aghaie, 2021). There are various reasons why it is good for teachers to reflect on their practice. For example, through reflective practice, teachers develop their own theories of teaching English or advance existing ones. Additionally, teachers make various links between theory and practice while exploring their own beliefs about teaching. Teachers also engage in evidence-based teaching practice, solve problems through inquiry and enhance their own teaching self-efficacy and professionalism (Farrell, 2015).

It is suggested that reflection for action may help teachers become more aware of how their beliefs influence their teaching, and how their classroom practices eventually affect their students' learning outcomes. Thus, one way to resolve the inconsistencies between teachers' reflection for action and to improve the teaching language skills is to implement professional development programs in a way that, English language teachers systematically engage in different types of reflection; experience different levels of reflection; reflect on the teaching-learning process from diverse angles, using interesting tools; and construct their reflective identities in an enjoyable fashion (Knobel & Kalman, 2016). Such knowledge can be acquired best when the models of reflections are applied regularly and consistently.

Reflective inquiry makes teacher-researchers engage in reflection as a means of development and adaptation by carefully studying their own professional practice. Through careful examination, teacher-researchers become more reflective, critical, and analytical of their own teaching and the life-long activity of a commitment to professional development takes place (Zeichner, 2003; Rust, 2007). In order to get used to systematic reflections, to apply the reflective models, and to understand the models' individual advantages and drawbacks, all learning situations or observations of experienced staff may be used as a starting point for reflections. Thus, this provides the lens through which teachers or student teachers can see their teaching process in an authentic way (Nilsson, Andersson, & Blomqvist, 2017).

Generally, reflection facilitates teachers to confront and challenge their current conceptions about the teaching-learning process and helps out teachers to assess their current practices, identify areas for improvement, become better decision-makers and deal with ambiguity, stress, and ever-changing

circumstances in promoting adults' learning. Reflective inquiry shapes the profession of teaching by giving teacher-researchers the opportunity to contribute to educational reform to grow professionally and become an actor of change in their community (Impedovo & Malik, 2016). Ideally, teacher education programs should expose teachers to a wide range of reflective practices to enable and encourage them to identify the various affordances for the transformation of the reflective tools since they are tasked with preparing their students for an uncertain future.

Literature Review

Scholars have discussed reflection from different perspectives for different purposes. According to Larrivee (2008), many consider reflective practice as the hallmark of professional competence for teachers that helps prospective teachers examine their practice critically and make rational and practical judgments about what to do in particular. In another trend, Zeichner and Liston (2004), have argued that refection is essentially an individual process, while Heather and Amy(2012), Osterman and Kotkamp, (2004), and Ghaye, (2011) have taken reflection as a social process and divided reflective practice into two major types; individual and group reflective practices. Individual reflective practices include; reflection-in-action, reflection on action, reflection through professional portfolios and logbooks while group reflective practices include reflection through peer observation, colleague feedback, student feedback, group discussions, seminars, mentoring, and reflective dialogues. In addition, Roskos, Vukelich, and Risko (2001) summarized the types of reflection discussed by scholars based on its function, structure, and timeline. Based on function, reflection includes personal reflection and classroom practice reflection; based on structure, reflection includes scaffolding, reframing, and debriefing; and based on a timeline, reflection includes retrospective reflection (reflecting on past actions), contemporaneous reflection (reflecting on the activities in-action), and anticipatory reflection (reflecting on future actions). As such, Heyler (2015) suggested that: Reflection is not just about looking back on what happened, it is encompassing. People instinctively reflect on events, perhaps to better understand what has happened and make sense of it; the idea of learning from the past, especially trying not to repeat mistakes is well established (p.22).

The importance of reflective teaching is further stressed by the fact that teacher education researchers have shown growing research interest in a wide range of reflective practice issues such as teachers' professional role identities and their reflective practice (Farrell, 2011; Aghaei, 2021); reflective teaching constraints, challenges, and experiences (Kuit & Reay, 2001; Wolfensberger et. al, 2010); developing English language teaching reflection inventory (Akbari, Behzadpoor, & Dadvand, 2010); case studies on reflective practice in an educational program (Liou, 2001); recruiting different instruments in reflective practices such as journal writing, peer videoing, research journal and action research protocols (Abednia, Hovassapian, Teimournezhad & Ghanbari, 2013; Harford & MacRuairc, 2008); and awareness-raising on being reflective teachers (Kabilan, 2007).

Regarding Mathew's (2017) arguments, it is possible to say that reflective teaching as a critical examination of teachers' performances is mainly determined by the way they self-evaluate because the self-evaluation process requires a deep understanding of how language teachers teach and to try to find reasons for why they teach in certain ways. This also holds true about an Iranian context where practitioners and theoreticians hold quite distinct interpretations as to what reflection is and who a reflector might be as well as the study by Javadi and Khatib (2014), who suggested that reflective teaching provides teachers with chances to explore "attitudes, develop management skills, and reflect on the ethical implications of practice in classrooms and thereby encourages teachers to step back and critically reflect not only on how they teach but also on why they teach in a particular way" (p. 86). Or in another study, Soodmand Afshar and Donyaie (2019) attempted to explore the contribution of reflection interactive workshops to Iranian EFL teachers' professional identity. To this end, 30 EFL teachers were asked to write two reflective journals before and after attending the reflective workshop. The findings

revealed that primary source of professional identity construction were reflection-on, -in, and –for action. In the same case, Soodmand Afshar and Farahani (2014) agree Reflective thinking plays a particularly important part in everyday activities. Whenever one is doing an activity, he or she might go through a thinking process to reflect on the activity either while the activity is being done or after it has finished. Furthermore, according to Zalipour (2015), reflective practice for teaching is for those teachers who are disposed to think about their teaching practices, and are willing to put reflective practice into action. The reflective practice challenges teachers who have unquestioned assumptions about good teaching and encourages them to examine themselves and their practices in the interest of continuous improvement. Additionally, Rahimi and Weisi (2018) examined the relationships among English as a foreign language (EFL) teachers' reflective practices, self-efficacy, and research practice. They collected from a survey of 150 EFL teachers engaging both with (i.e. through reading) and in (i.e. through doing) research in English language teaching (ELT). The findings of the study indicated significant and positive associations among EFL teachers' reflective practice, self-efficacy, and research practice. Regarding the effective influence of reflective practice on teachers' professional growth, Motallebzadeh, Hosseinnia, and Domskey (2016) carried out a mixed-methods study. A total of 20 Iranian EFL teachers took part in this study. The researchers came to the conclusion that peer observation in some ways could positively affect the professional growth of Iranian EFL teachers. The results from interviews also indicated that participants perceived peer observation as a beneficial tool in their teaching process.

As a learning tool, reflection may be more powerful when it has been used as a structure or framework to guide teachers. There are many models and tools of reflection available to help teachers engage in the process which can assist them to move out of 'auto-pilot' in their practice. Thus, it is important that teachers choose the model that works best to help them to learn from their reflections. Reflection models were mainly developed in English-speaking countries by Kolb (2014), Gibbs (1988), Rolfe et al. (2010) , and Greenway (1995) as simple and cyclic measurements. While, the proposed model by Akbari, et al (2010) was introduced as the only instrument available in Iran to measure teacher reflection in the field of ELT.

Reflective practices change over time and may require users to employ different tools or develop different habits of mind, and almost always depend upon the context in which individuals find themselves (Hajira & Shams, 2012). Indeed, validating a data collection instrument is a cyclical process that does not stop even after the instrument has been initially validated. Therefore, replication studies are required that provide further validation from several dimensions. Due to the novelty of the instrument by Akbari, et al. (2010) in Iran, he strongly recommended that further studies be conducted in different contexts to test its relevance and validity. Moreover, in most teacher-training courses and programs in Iran, novice teachers are unaware of reflective teaching practices, and they do not know how to reflect on their methodology before, during, and after conducting a lesson (Akbari, Behzadpoor, and Dadvand, 2010). Although reflection is unique to each learner, it does not occur by chance, so educators must provide exercises, strategies, and practical tools to promote reflective thinking (Harrison, Short, & Roberts, 2003).

The literature regarding reflection has indicated that most of the studies focus on its theoretical aspect, while the practical realization of the underlying structures of the items that make up reflection-for-action has been largely untouched. Accordingly, there is a pressing need to gain insights into the actual classroom practices adopted by the teachers and the belief systems and theories which underlie the structures of reflection in such practices. To this end, the present study was an endeavor to reconceptualize the perspective of Iranian EFL teachers concerning the applicability of this pedagogy.

Purpose of the study

Researchers mainly use qualitative methods to study reflection, but mixed methods and quantitative studies are carried out as well. Regarding the significance of reflection and its implications on one hand

and the lack of empirical studies on nonnative EFL teachers' viewpoints and beliefs, on the other hand, the present study tries to highlight the extension of this discourse in the context of Iran.

This study was an attempt to provide a step-by-step approach to factor analysis procedures and to offer an assessment of the theoretical and practical merits associated with the underlying structure of the items and factors that made up 'reflection research' in Iran, which leads to design and develop a standardized instrument. Alternatively, it was first necessary to discover the latent variables of teachers' reflection for action and group them into a limited set of clusters based on common variance through exploratory factor analysis. Therefore, it helps to isolate constructs and concepts. Furthermore, the aim of this study is to provide insight into a built-in procedure of a new design and model of reflective teaching and reflective practitioner development as a professional development program for teachers assesses teachers' strengths and weaknesses. In this vein, the main purpose of this study is to explore the internal consistency and factor structure of instruments for measuring reflection to find out the validity and reliability of such assessment instruments. Consequently, the following research question has been proposed.

Which set of items should appropriately be included in the final instruments based on analyses of psychometric properties of the developed instrument that measures teachers' reflection-for-action scale?

Methodology

Participants

The participants of this study were 150 EFL teachers (71% males and 29% females) holding a B.A. (18%), M.A. (54%), and Ph.D. (28%) degree in one of the following majors: TEFL, English Literature, English Translation or Linguistics with the age range of 20-55, who had 2 to 30 years of teaching experience, from different English language institutes and universities in Iran. They all participated in this study based on convenience sampling in the academic year of 2020.

Instruments

In this study, a teacher reflection-for-action questionnaire was designed in order to construct the proposed questionnaire and the items were then, developed based on a corpus of well-known available questionnaires and scales on reflection-for-action, such as The teacher reflectivity questionnaire proposed by Akbari et al. (2010), The Teacher Reflective Practices scale utilized by Tok and Dolapçıoğlu (2013), Reflection in Learning proposed by Sobral (2001), Reflection Questionnaire by Kember et al. (2000), Groningen Reflection Ability Scale, by Aukes et al. (2007) and, Self-Reflection and Insight Scale by Grant, Franklin, and Lang-ford (2002).

Then, the items which were identified from the review of the related literature were rectified through interviews with six experts, enjoyed from Google scholar, and the Academia Letters Website. The interview questions presented the main constructs of the questionnaire, focusing on the various dimensions of teacher reflection-for-action. In order to avoid any biased item order, the items were randomized in the questionnaire. Furthermore, the purpose of the questionnaire and the way to complete the items were written through clear instructions. The questionnaire (Appendix A) consisted of items on a five-point Likert scale rating from Never (rated 1) to Always (rated 5).

Data Collection Procedures

In order to develop and design the questionnaire, a set of potential items was collected in order to measure the examined construct (Dörnyei & Taguchi, 2010). As such, the existing scales on attitudes towards reflection-for-action, and other related issues were studied in order to identify possible items. These steps led to the construction of 74 items by the researchers. The items were submitted to several domain experts to judge their redundancy, face validity, content validity, and language clarity. Also, the experts were asked to comment on the content of the items and add appropriate items or offer potential items if necessary. Moreover, carefully reviewing the experts' comments, the researchers ended up with a

draft version of 49 items. Based on Khatib and Rahimi (2015), to ascertain that the items could be perfectly understood by respondents, the final version was translated into Persian by one of the researchers who was an NS of Persian and then back-translated into English to ensure parallelism between the English and the Persian version. Clear instructions on the purpose of the questionnaire and appropriate resprespons were provided. Then the first draft of the questionnaire was distributed to 150 teachers. Each participant was sent a link made in Google Forms through social networking websites such as Research Gate, LinkedIn, and E-mail or online applications such as WhatsApp and Telegram. Also, they were asked to send comments about the clarity of directions and length of the questionnaire. As for the format, a 5-point Likert scale ranging from 'never' to 'always' was selected. Lastly, all the developed items were checked once. This step of the analysis resulted in the sub-components of reflection to be measured in the subsequent phases of the study.

Results

The Five-Step Exploratory Factor Analysis Protocol

Although EFA is a seemingly complex statistical approach, the approach taken to the analysis is in fact sequential and linear, with many options. Therefore, it is essential to develop a protocol or a decision-making pathway for possible omissions. The following Five-Step Exploratory Factor Analysis Protocol provides crucial procedures for developing clear pathways for decision making. Each of these steps is explained in more detail.

Step One: Discovering the Possibility of Performing Factor Analysis

Before using the data for factor analysis, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were applied to the data to confirm the adequacy and relevance of the data (table 1). Technically, the values below 0.7 for KMO meant that factor analysis of the data was not possible. As it was shown in table 1, the KMO sample sufficiency measure of 0.864 indicated, which was well above the required minimum level of 0.7 (Tabachnick & Fidell, 2007); therefore, it was possible to perform a factor analysis on the data in the current study. Bartlett's test is used to test if several samples have equal variances. If so, this is called homogeneity of variances and when the Bartlett test value is less than 0.05 at the error level, there is a significant relationship between the variables and it is possible to discover the new structure of the data (Chua, 2014). A significant level in the table indicated that this value was 0 and less than 0.05; therefore, factor analysis was adequate to discover the new structure of the data. Indeed, these tests show that we do have patterned relationships amongst the variables and both indices supported the factorability of the data.

Table 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.864
Bartlett's Test of Sphericity	Approx. Chi-Square	6199.326
	Df	1176
	Sig.	.000

Step Two: Extraction of Common Value of Components

In the second step, the commonalities were extracted (Table 2). Communality is the variance of the observed variables due to common factors or in other words, it is possible to obtain a matrix of factor weights. There are numerous ways to extract factors, as such Thompson (2004), noted that Principal components analysis (PCA) is the default method in many statistical programs, and thus, is most commonly used in EFA. Additionally, Pett et al. (2003) suggested using PCA in establishing preliminary

solutions in EFA. The initial column represents the total variance for each factor before the factor was extracted. The closer the values to the number 1 are, the better the factors of the extracted variables are. As a general rule, the variables that were not determined above 0.5 (50%) should be eliminated as they do not correlate with other latent factors. As it was displayed in the table below, the value for all questions was over 0.5, which means no question was needed to be removed and the existing variables could be converted into factors.

Table 2

Extraction of the Common Items of Components

Questions	Initial	Extraction	Questions	Initial	Extraction
QUE1	1.000	.736	QUE27	1.000	.790
QUE2	1.000	.663	QUE28	1.000	.659
QUE3	1.000	.713	QUE29	1.000	.742
QUE4	1.000	.673	QUE30	1.000	.687
QUE5	1.000	.731	QUE31	1.000	.706
QUE6	1.000	.697	QUE32	1.000	.651
QUE7	1.000	.666	QUE33	1.000	.745
QUE8	1.000	.753	QUE34	1.000	.635
QUE9	1.000	.634	QUE35	1.000	.659
QUE10	1.000	.688	QUE36	1.000	.758
QUE11	1.000	.671	QUE37	1.000	.783
QUE12	1.000	.631	QUE38	1.000	.677
QUE13	1.000	.647	QUE39	1.000	.513
QUE14	1.000	.555	QUE40	1.000	.512
QUE15	1.000	.724	QUE41	1.000	.519
QUE16	1.000	.701	QUE42	1.000	.590
QUE17	1.000	.778	QUE43	1.000	.655
QUE18	1.000	.773	QUE44	1.000	.623
QUE19	1.000	.804	QUE45	1.000	.645
QUE20	1.000	.781	QUE46	1.000	.653
QUE21	1.000	.549	QUE47	1.000	.672
QUE22	1.000	.495	QUE48	1.000	.668
QUE23	1.000	.624	QUE49	1.000	.614
QUE24	1.000	.518			
QUE25	1.000	.729			
QUE26	1.000	.806			

Extraction Method: Principal Component Analysis.

Step Three: Total Value of Explained Variance

In the third step, the total amount of explained variance is calculated. Referring to Kaiser–Guttman rule or the Kaiser criterion, only agents have selected whose values are more than one (Habib Pour & Safari, 2012). The Kaiser–Guttman rule has wide appeal because of its simplicity and objectivity; in fact, it is the default in popular statistical software packages such as SPSS. Eigenvalue and scree plot also indicated the proportion of variance contribution extracted by each factor through factor analysis (Chua, 2014), where factors with an eigenvalue lower than 1.0 were removed from the factor list. In common practice, factor scores are calculated with a mean or sum of measured variables that "load" on a factor. As

presented in Table 3, there were 10 components with eigenvalues of more than 1. These components could explain a total of 66.58 percent of the total variance. After Varimax rotation, The first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth factors could explain nearly 9.42, 9.27, 8.66, 7.97, 7.88, 7.32, 4.49, 4.19, 3.88, 3.51 of the total variance, respectively. Hence, all the statistical requirements for doing an eligible factor analysis were met.

Table 3

Eigenvalues and Total Variance Explained in EFA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.809	28.182	28.182	13.809	28.182	28.182	4.615	9.418	9.418
2	4.015	8.194	36.377	4.015	8.194	36.377	4.541	9.268	18.686
3	3.044	6.212	42.589	3.044	6.212	42.589	4.241	8.656	27.342
4	2.461	5.021	47.610	2.461	5.021	47.610	3.903	7.965	35.307
5	2.314	4.722	52.332	2.314	4.722	52.332	3.861	7.879	43.186
6	1.912	3.901	56.233	1.912	3.901	56.233	3.589	7.324	50.509
7	1.539	3.142	59.375	1.539	3.142	59.375	2.200	4.490	54.999
8	1.269	2.590	61.965	1.269	2.590	61.965	2.054	4.192	59.191
9	1.250	2.552	64.517	1.250	2.552	64.517	1.901	3.879	63.070
10	1.012	2.065	66.582	1.012	2.065	66.582	1.721	3.511	66.582
11	.937	1.913	68.495						
12	.869	1.774	70.269						
13	.839	1.712	71.981						
14	.808	1.648	73.629						
15	.780	1.593	75.222						
16	.710	1.449	76.671						
17	.685	1.399	78.069						
18	.612	1.250	79.319						
19	.595	1.214	80.533						
20	.580	1.184	81.717						
21	.562	1.147	82.864						
22	.530	1.081	83.945						
23	.519	1.059	85.005						
24	.481	.981	85.986						
25	.458	.936	86.921						
26	.450	.919	87.840						
27	.431	.879	88.719						
28	.412	.841	89.560						
29	.398	.813	90.372						
30	.372	.760	91.132						
31	.351	.716	91.848						
32	.347	.709	92.557						
33	.328	.670	93.227						
34	.317	.646	93.873						
35	.312	.637	94.511						
36	.295	.601	95.112						

37	.288	.589	95.701
38	.270	.551	96.252
39	.246	.502	96.754
40	.236	.481	97.235
41	.205	.418	97.653
42	.198	.404	98.056
43	.193	.395	98.451
44	.181	.370	98.821
45	.173	.354	99.175
46	.148	.303	99.478
47	.134	.274	99.752
48	.115	.235	99.987
49	.006	.013	100.000

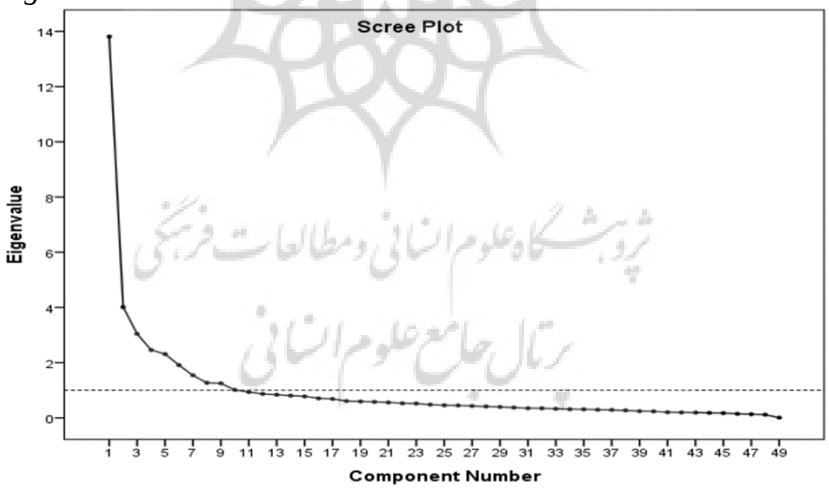
Extraction Method: Principal Component Analysis.

Scree Test Criteria

Scree Test got its name from Cattell (1973) due to the Scree Test graphical presentation, which has visual similarities to the rock debris (Scree) at the foot of a mountain. The scree plot in Figure 1, also confirms the above results in table 3, which consists of eigenvalues and factors. The x-axis represents the factors (components) and the eigenvalues are along the y-axis. The eigenvalues continually decrease resulting in a picture that is often called the "elbow" shape. The number of factors to be retained is the data points that are above the break (i.e., point of inflection). To determine the 'break', researchers draw a horizontal line and a vertical line starting from each end of the curve.

Figure 1

The Scree plot of the eigenvalues in EFA



Step Four: Rotation of the Items to Get a Final Answer

Once the appropriate number of factors has been determined, the extracted factors are rotated, to foster their interpretability. This step as presented in table 4, indicated the Rotated Matrix of Components to classify the items based on the factor load. There are two major categories of rotations, orthogonal rotations, which produce uncorrelated factors, and oblique rotations, which produce correlated factors. The best orthogonal rotation is widely believed to be Varimax which is more easily interpreted because the factor loadings represent correlations between the indicators and the latent factors As such, the highest number in each row, indicated the related factor of each item. For example, in the first row the

value of %74 was greater than other numbers in the row, which can be concluded that this item belonged to the sixth factor. All in all, as table 4 depicted, 10 factors were identified through this analysis that, the items from 43 to 49 belonged to the first factor , the items from 6 to 12 belonged to the second factor, the items from 30 to 35 belonged to the third factor, the items from 16 to 20 belonged to the fourth factor, the items from 25 to 29 belonged to the fifth factor, the items from 1 to 5 belonged to the sixth factor, the items from 36 to 38 belonged to the seventh factor, the items from 21 to 24 belonged to the eighth factor, the items from 13 to 15 belonged to the ninth factor, the items from 39 to 42 belonged to the tenth factor.

Table 4

Rotated Component Matrix[a] in EFA

	Component									
	1	2	3	4	5	6	7	8	9	10
QUE1	.20	.12	.23	.12	.08	**.74**	.19	.11	-.06	.04
QUE2	.21	.19	.05	.07	.12	**.73**	.09	.06	.07	.12
QUE3	.12	.12	.15	.12	.02	**.79**	.09	.12	.06	-.01
QUE4	.14	.15	.16	.17	.00	**.73**	-.01	.16	.11	.04
QUE5	.24	.15	.08	.02	.14	**.76**	.12	.14	.05	.09
QUE6	.19	**.72**	.25	.03	.19	.09	.02	.13	.06	.09
QUE7	.16	**.67**	.22	-.01	.22	.22	.01	.17	.04	.10
QUE8	.22	**.73**	.14	.13	.22	.16	-.01	.12	.09	.20
QUE9	.17	**.67**	.20	.05	.14	.20	.22	-.03	.07	.05
QUE10	.12	**.71**	.21	.15	.15	.13	.08	.19	.13	.08
QUE11	.20	**.73**	.24	.03	.03	.15	.07	.08	-.02	-.01
QUE12	.23	**.62**	.27	.01	.20	-.01	.12	.25	-.01	.06
QUE13	.21	.03	.21	.05	-.09	.02	.12	.04	**.73**	.00
QUE14	.23	-.05	.29	-.02	.01	.07	.00	.12	**.63**	-.01
QUE15	.11	.25	.09	.11	.05	.13	.05	.08	**.77**	-.04
QUE16	.06	-.03	.07	**.81**	.11	.09	.05	.06	.10	.01
QUE17	.14	.04	.09	**.83**	.15	.15	.04	.06	.05	.05
QUE18	.16	.11	.08	**.82**	.12	.08	.00	.04	.01	.16
QUE19	.03	.05	.14	**.82**	.10	.15	.26	.00	-.05	.07
QUE20	.13	.12	-.04	**.81**	.09	-.01	.24	.15	.04	.07
QUE21	.17	.23	.15	.15	.05	.21	.00	**.61**	.07	.06
QUE22	.03	.33	.18	.08	-.02	.06	.18	**.55**	.01	.09
QUE23	.05	.02	.06	.02	-.04	.14	.03	**.76**	.11	.03
QUE24	.15	.20	.15	.10	-.10	.15	.05	**.54**	.05	.15
QUE25	.10	.21	.07	.15	**.77**	-.05	.16	-.01	-.02	.14
QUE26	.08	.18	.02	.09	**.86**	.13	-.02	-.01	.00	.07
QUE27	.20	.12	.10	.11	**.83**	.08	.11	.01	.04	.08
QUE28	.10	.20	.16	.13	**.73**	.11	.07	-.01	-.01	.09
QUE29	.07	.08	.10	.11	**.81**	.05	.18	-.07	-.04	.12
QUE30	.20	.09	**.75**	.09	.06	.13	-.05	.09	.17	.02
QUE31	.15	.29	**.74**	.02	.09	.10	.10	.07	.02	-.10
QUE32	.10	.23	**.72**	.04	.09	.11	-.07	.14	.12	-.02
QUE33	.16	.18	**.80**	.11	.01	.09	.07	.10	.08	-.05
QUE34	.15	.20	**.72**	.05	.11	.10	.02	.10	.14	.08
QUE35	.12	.32	**.69**	.09	.14	.16	.02	.05	.09	.07
QUE36	.08	.11	.13	.27	.20	.23	**.74**	.00	.00	.07

QUE37	.19	.19	-.06	.25	.16	.04	**.75**	.17	.13	.07
QUE38	.15	.06	-.07	.13	.19	.28	**.68**	.07	.11	.18
QUE39	.08	.19	-.04	.09	.14	.07	.12	.13	-.01	**.55**
QUE40	-.11	.06	-.08	.02	.14	.20	-.01	.06	.14	**.64**
QUE41	.12	.08	.15	.00	.11	-.03	.32	.15	.00	**.49**
QUE42	.17	.05	.01	.24	.09	-.02	.00	-.02	-.27	**.65**
QUE43	**.74**	.14	.13	.06	.01	.19	.01	-.02	.16	.10
QUE44	**.67**	.19	.21	.13	.09	.16	.06	.06	.11	.17
QUE45	**.71**	.12	.21	.12	.04	.11	.17	.15	.06	.00
QUE46	**.73**	.21	.11	.12	.06	.10	-.07	.14	.11	.00
QUE47	**.73**	.16	.09	.07	.20	.15	.06	.18	.04	.01
QUE48	**.73**	.18	.10	.12	.15	.15	.14	-.01	.13	-.03
QUE49	**.74**	.11	.12	.03	.11	.11	.12	-.01	.04	.05

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Step five: Interpretation

During interpretation, the researcher examines which variables are to be assigned to a factor and gives this factor a name or theme. Naming factors are more of an "art" as there are no naming rules. Traditionally, at least two or three variables must load on a factor so it can be given a meaningful interpretation. The labelling of factors is a subjective, theoretical, and inductive process. Henson and Roberts (2006) noted "the meaningfulness of latent factors is ultimately depends on the definition of the researcher and the research questions." The reason for comprehensive and systematic factor analyses is to isolate items with high loadings in the resultant pattern matrices. In other words, it is a search to find those factors that taken together explain the majority of the responses. Even more, it is important that these labels or constructs reflect the theoretical and conceptual intent. Deals with the concepts of the study the 10 factors made up reflection-for-action in this study, were labelled as follows: Academic Qualification as the (first factor), Experience (second factor), Professional Development (third factor), Collaboration (fourth factor), Perception (fifth factor), Efficacy (sixth factor), Motivation (seventh factor), Identity (eighth factor), Commitment (ninth factor), Critical thinking (tenth factor).

Reliability indices

After running EFA, the internal consistency and reliability of the factors was measured, which eventually leads to a reflection-for-action questionnaire. Internal consistencies for the whole questionnaire and for the individual extracted factors were calculated through Cronbach's alpha. As a guideline, measures higher than .7 are considered as acceptable (Dörnyei, 2007). As seen in table5, seven factors were reliable as their index were over than .7, which indicated an acceptable level of internal consistency, but the eighth, ninth, and tenth factors represented low reliability.

Table 5

Cronbach's Alpha for Components of Reflective Teaching Questionnaire

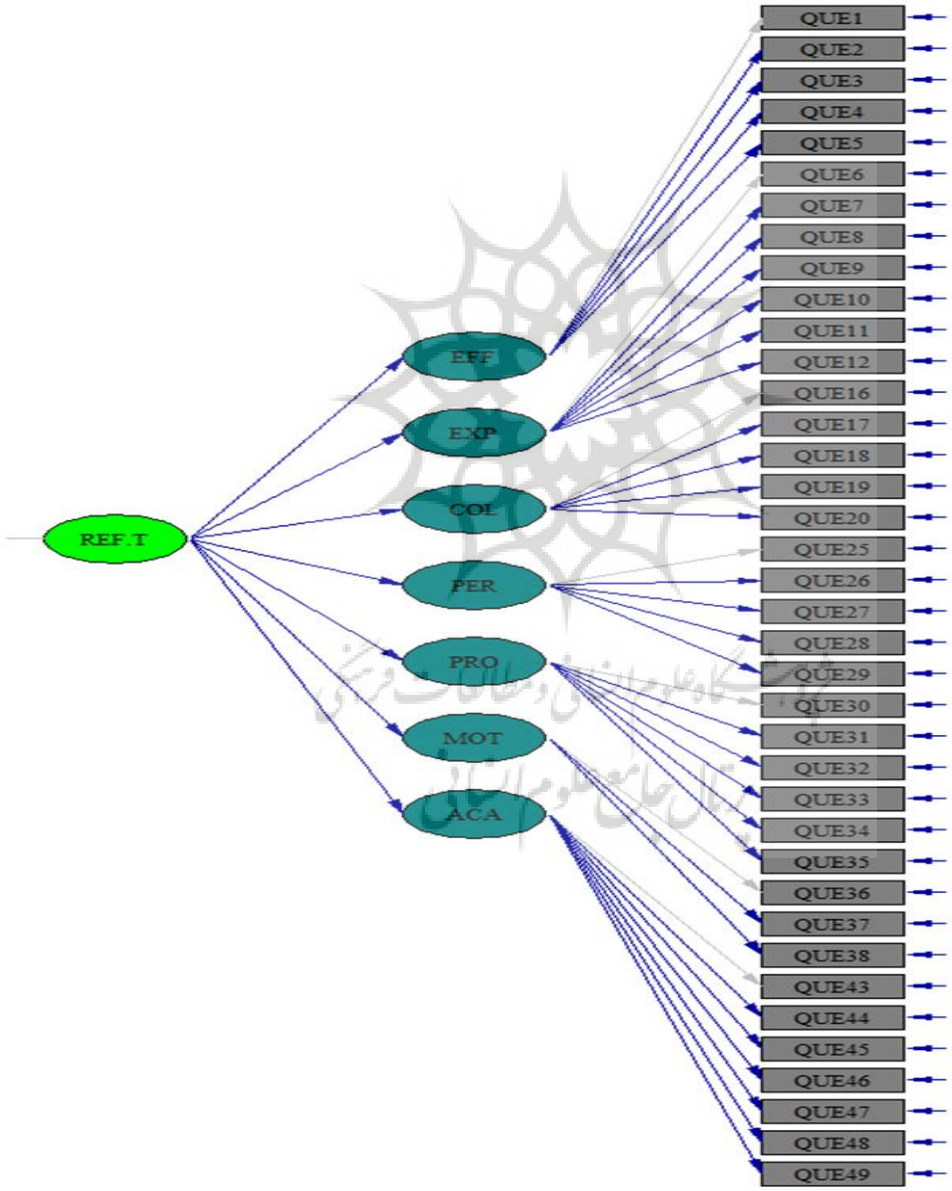
Factors	Number of Items	Cronbach's Alpha
Academic Qualification	7	0.899
Experience	7	0.910
Professional Development	6	0.901
Collaboration	5	0.912
Perception	5	0.907
Efficacy	5	0.887

Motivation	3	0.819
Identity	4	0.578
Commitment	3	0.602
Critical Thinking	4	0.519

Deals with table 5, low reliability factors (eighth, ninth, and tenth) along with their items were deleted. Without these eleven items, the reliability of the total questionnaire was investigated as .943, which was the satisfying index for the reflection-for-action questionnaire. From the results obtained above, Figure 2 presents the proposed model of the study.

Figure 2

Conceptual Model for 38-Items Reflection-for-action scale



Discussion

This study investigated the Reliability and Factor Structure of the newly-designed reflection-for-action scale in an Iranian EFL Context through an exploratory factor analysis protocol. Seven points were discussed: 1) an overview of factor analysis 2) types of factor analysis 3) the suitability of the data for factor analysis 4) how factors can be extracted from the data 5) what determines factor extraction 6) types of rotation methods, and 7) interpretation and construct labeling that eventually results in the identification of factors such as collaboration, motivation, perception, experience, academic qualification, professional development, and efficacy.

The previous study which was the only model in Iran developed by Akbari, et al (2010) proposed six factors of practical, cognitive, affective, metacognitive, critical, and moral, which involved active control over the process of thinking that was used in learning situations. These derived factors mostly belonged in the domain of experimental psychology and philosophy of mind. On the contrary, this study was mostly attempted to explore interconnections between reflection and teaching. In line with American attitudes toward the reflection model, the Iranian model invented by Akbari et.al (2010), was action-oriented with the main focus on critical thinking. However, Gibbs (1988) and Kolb (2014), suggested that one of the key things is the acknowledgment of the importance of Feelings in reflection. In a similar study with American models, Chang (2019) indicates that reflection may affect students' affective levels, but not necessarily their cognitive levels. One possible reason for the exclusion of affective components or feelings in Iranian models can be teachers' role perceptions, which bars them from getting overly involved in issues of moral significance (Hansen, 2001). In addition, socio-political norms, educational background, the way of thinking, direct instruction, socio-economic status, occupation, media, and the status of the teaching profession in general and English teaching in particular, as well as the conditions under which instruction occurs in each context, have a major influence in shaping people's opinions and beliefs, as they lay the foundation of understanding and moral concepts within the individual.

Just as significant, American models have some pros and cons, as such, the benefits of Kolb's (2014) learning cycle (Concrete experience, Reflective observation, Abstract conceptualization, Active experimentation) is that each stage of the model is associated with a different preferred learning style. This ensures that all preferred learning styles are used as the teacher step through the model. And, the model forces the teacher to use more tools than simply broadcasting their knowledge to the student. The disadvantages of Kolb's (2014) learning cycle include: The recognition that learners have different learning styles is useful, but it can be difficult for a trainer to accommodate a range of learning techniques in a group situation. Or it is not always obvious how to apply the model in the real world. Because the teacher is no longer broadcasting their knowledge, they need to know their students already to tailor the training to them. Even more, the continuous cycle approach to learning may not be ideal if teachers need to take an exam at some point. Or the cyclic and systematic model of Gibbs (1988) (description, feelings, evaluation, analysis, conclusions, and action plan) is easy to understand and easy to use, it allows teachers to learn over time based on their experiences, and over time it gives them more balanced and accurate judgment. On another point, criticisms of Gibbs' (1988) Reflective Cycle suggested that it's a reactive rather than proactive approach to improving a teacher's skill set. In contrary with Gibbs model, Rolfe et al. (2010) presented their model (What, So What?, Now What?) as an action-oriented stage, focusing on a proactive approach. The model may be used with the learner noting down the different headings and then making notes on the event. This model deals with more pros than cons, which indicates this is a good model, particularly when considering the ease of application; models are likely to be used more extensively when they are easy to use, also it is simple to understand, with clear guidance on the contents of each stage which is more comprehensive

In the Turkish higher education context Yeşilbursa (2013), developed her own model based on the factors suggested by Akbari et al. with results that indicated similarity with those of the original study.

Specifically, the cognitive, meta-cognitive, and critical factors remained largely intact, and the affective and moral factors were not validated. Thus, the Turkish model complies with Iranian models in not applying affective factors in the reflection model.

The main factors derived from this study have been consistent with various previous studies in the field. Krutka, et al. (2014), supported the effectiveness of collaboration, that collective reflection among teachers brings different ideas and enhances students' learning from various perspectives. Reflection shared with the whole class enabled students to read others' reflections posted on their blogs and to understand each other's projects better. Collaborative reflection can bring different perspectives when we have dialogues with others when others see things differently, ask different questions, or challenge our assumptions. In another trend, Lee (2007), concluded that in order for teachers to become reflective of their teaching practices, they must be motivated to change their teaching strategies when needed. In order to help pre-service teachers to teach reflectively, they have to acquire this skill from the very beginning of the learning-to-teach process.

Another driven factor was experience which is the basis of Kolb's (2014) reflective model in emphasizing teachers' own experiences, which is then reviewed, analyzed, and evaluated systematically in three stages. Once this process has been undergone completely, the new experiences will form the starting point for another cycle**.** In the same case, the reflective model according to Gibbs, inspired partly by Kolb's (2014) learning cycle, consider his model as a process that requires that one look beneath the surface of events and experiences achieve deeper levels of understanding and learning. However, the basis of this model is to systematize reflections and isolate feelings; a factor that was not derived from the present study.

Regarding professional development, Gutiérrez, Adasme, and Westmacott (2019) mentioned in their research study that reflectivity can enhance the process of professional development of EFL teachers, they also accentuated the highly effective role of reflectivity components such as peer collaboration and interaction with colleagues in reshaping the professional identities of teachers. in another similar finding, Liu and Zhang (2014) verified that enhancing teachers' professional development is highly possible through reflective teaching.

Motivation emerged as another component of reflective teaching, in the same vein, Alrababi (2014), proposed that one influential factor in the language teaching enterprise is ensuring the existence of motivation on the part of learners; here, most language teachers believe that motivation is a key factor for success in language learning.

In congruence with perception as another factor falling in this category, Seitova (2019), in her study used the term teachers' perceptions on reflective practice, so that the emergent perception theory on reflective teaching practices involves English teachers' awareness of reflective teaching through the help of students' and principals' perception, teaching practices inside their classes, teachers' accounts in teaching, teachers' reflection, teachers' practice to reflective teaching.

Bleakley (1999) realized that reflective practice has become the major model for continuing professional development in higher education. These claims supported the academic qualification factor in the present study. In another case, Black's (2015) study on developing teacher candidates' self-efficacy through reflection emphasized the value of EFL teachers' reflective teaching as a crucial factor in their future professional success which supported the last identifying factor. In contrary with all the above findings, in the study by Synth (1993) regarding "Reflective practice in teacher education", the results revealed that reflection should not be restricted to examining only technical skills; it should equally be concerned with the ethical, social and political context within which teaching occurs.

Conclusion

Throughout this century many educators have argued that teachers need to be more reflective about their work since schools and society are constantly changing and teachers must be reflective in order to cope

effectively with changing circumstances. Likewise, by using this reflection inventory model, language teachers can hopefully find appropriate methods to improve their teaching careers. In order to get used to systematic reflections, to apply the reflective models, and to understand the models' individual advantages and drawbacks, all learning situations or observations of experienced staff may be used as a starting point for reflections, this provides the lens in which teachers or student teachers can see their teaching process in an authentic way (Knobel & Kalman, 2016).

Reflective practices can be scaffolded and developed but to do so involves more than training, it involves education. Providing teachers with hands-on experiences of innovative and unknown reflective practices that are mapped onto the reflection for action framework to show a reciprocal relationship between existing knowledge domains challenges them to take a critical stance towards education and avoid both utopian and dystopian views of reflective practice. Importantly, language teachers' reflection for action is not frequently interrogated and there is a need for research that delves more into what it means to be a teacher in the reflective age as well as into what it is language teachers are actually teaching as a domain of reflection for action. From an ecological perspective, teachers of second and foreign languages are "teachers of meaning' and not just 'teachers of a linguistic code" (Kramsch, 2008).

A reflective practice model should offer teachers the possibility to experience reflective practices themselves and encourage them to discuss and reflect on their experiences. Teachers also need opportunities to extend their understandings about affordances of reflective practices in creative and innovative ways (Oteanu, 2016). In turn, the reflection for action model should be used as a tool that teachers make use of to enhance the integration of reflective practices into their classrooms (Andrea & Gosling, 2005). Thus, the model presented here has the potential to help teachers visualize how their reflection alongside their skills work in tandem with their other knowledge domains about teaching and learning.

The findings of the present study would also have implications for people working within international language teacher education programs. These programs usually have many international students from different EFL countries. Thus, ESL programs may need to design a curriculum based on reflection for action with the potential to enable students from EFL contexts to function effectively when they return to their countries and become involved in the unique working conditions and the local practices of EFL teaching. By gaining an understanding of the characteristics of EFL contexts, teachers in reflective programs can take into account how the most recent theories and teaching models can be compromised with the contextual barriers in the EFL local contexts. This will even be useful to native speakers who plan to teach English in EFL settings (Kwapong, 2019).

Like any other research study, the present study suffered from certain limitations which should be kept in mind. The social, cultural, academic, ethnic, cognitive, emotional backgrounds, and some of the teachers' characteristics toward English language learning of the study constituted the primary limitation that could not be truly controlled. As this study was conducted with only university EFL instructors, this can be further replicated to involve more EFL teachers, even in primary or secondary levels to increase the validity and reliability of its findings. Furthermore, all teachers who participated in this study were Iranian EFL teachers, it would be interesting to replicate the study with samples of teachers from a more diverse range of cultures. If, as the literature has suggested, the reflection teaching paradigm is closely tied to Western belief systems and philosophies, it would be particularly interesting to administer and check the reliability and validity of this newly-designed instrument to teachers from these cultures and the material used in this study can be filled out considering gender and age differences. Indeed, deeper levels of reflection are less frequently identified and, as a result, appear to be more difficult to achieve. Thus, further research is required to focus attention on the degree to which coping strategies proposed here can help improve teachers' reflectivity. Just as significant, it is recommended, that more attention needs to be given to the importance of the role of emotion in understanding and developing the capacities for reflection which facilitates personal, professional, and ultimately system change.

This study suggests that an area deserving further research concerns professional development courses that provide teachers with opportunities to confront their pre-existing beliefs, challenge their conceptual inflexibility, and investigate the actual processes through which language teachers' actual beliefs and practices are transformed (Borg, 2011). This study highlights, therefore, a need expressed by other new literacies researchers, namely to develop and share professional development models that support and scaffold teachers in their shift towards a 21st-century educational paradigm where the use of reflective tools is synonymous with learning.

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Appendices

Appendix A: EFL Teachers' Reflection-for-action Inventory Scale

Items	Never	Rarely	Sometimes	Often	Always
A. Collaboration					
1- I ask my students whether they like a teaching task or not.					
2-I ask my colleagues to observe my teaching and comment on my teaching performance.					
3- I talk about the accomplishments/failures of each lesson with my colleagues, after each session.					
4-I discuss practical/theoretical issues regarding being prepared before coming to class with my colleagues.					
5- I empathize with colleagues'/others' viewpoints.					
B. Motivation					
6- I try to find out which aspects of my teaching provide me with a sense of satisfaction.					
7- I make decisions about the events of the class as they happen.					
8-Sometimes I find myself saying things and I have no idea why I said them.					
C. Perception					
9- I have a file where I keep my accounts of my teaching for reviewing purposes.					
10 - I think about my strengths and weaknesses as a teacher.					
11- I think of inconsistencies and contradictions that occur in my classroom practice.					
12-I acknowledge what students bring to the learning process.					
13 -It's easy for me to figure out what someone else is thinking or feeling.					
D. Experience					

14 -I write about the accomplishments/failures of each lesson after each session.	
15-I think about my teaching strategy and the way it is affecting my teaching.	
16- I often evaluate my experience so I can learn from it and improve for my next performance.	
17-I like to think over what I have been doing and consider alternative ways of doing it.	
18- I see teaching practices as remaining open to further investigation.	
19- I observe events and situations that involve me.	
20-I identify alternative ways of representing ideas and concepts to students.	
E. Academic Qualification	
21- I see no need for thoughtfully connecting teaching actions with student learning or behavior.	
22 - I modify teaching strategies without challenging underlying assumptions about teaching and learning.	
23- I consider students' perspectives in decision-making.	
24- I change my behavior or actions as different events of the class happen.	
25-I do research/investigate issues to solve problems.	
26-I make an image/sound record of my teaching issues.	
27- I am sufficiently empowered to teach.	
F. Professional Development	
28-I often reflect on my actions to see whether I can improve what I did.	
29-I read books/articles related to effective teaching to improve my classroom performance.	
30-I participate in workshops/conferences related to teaching/learning issues.	
31- I establish a clear set of rules for my students to follow in terms of their classroom attendance and the way they will be evaluated at the end of the course.	
32- I read the research works in the field of my study.	
33- I overcome any self-imposed barriers, habits.	
G. Efficacy	
34- I carry out small-scale research activities in my classes to become better informed of learning/teaching processes.	
35-I think of the meaning or significance of my job as a teacher.	
36- I pay attention to the impact of my actions on others' feelings.	
37- I like to think about the reasons behind my actions.	
38- I have a genuine curiosity about the effectiveness of teaching practices, leading to experimentation and risk-taking.	