



Development of an Instrument to Explore Teacher Roles Based on Perceptions of English Learners in Online Learning Context

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Abstract

In order to examine teacher roles in ELT contexts more specifically, this study aims to develop an instrument (A Scale of Teacher Role Inventory, in short STRI) that measures teacher roles based on the perceptions of English learners in online learning context. The instrument was constructed under the conceptual framework of role theory by Coppola (2002) and on the basis of the scenario of open-ended question responded by 296 university students as well as an interview of 15 university students in previous investigations. A tentative questionnaire of 46 items was designed and later administered to 251 university students for the pilot study. In order to validate the instrument, both item analysis and exploratory factor analysis were conducted to delete 19 less valid items and develop the final version of a scale with 27 items. Statistical results showed that KMO was .938 ($p = .000 < .005$) and 27 items fell into three main factors: cognitive role, affective role and managerial role. The Cronbach's Alpha value of the final 27-item scale is .924, which indicates that it is a fairly reliable measurement. To further validate this final version of 27-item instrument, the questionnaire was administered to 153 university students. *The results showed that the scale is reliable and valid with Cronbach's Alpha value of .955.* The research findings suggested that this instrument of STRI could be used to scrutinize the specific tasks of teachers and reveal possible role changes not only in online learning modes but also across different instructional contexts.

Key words: Teacher roles; Online learning context; Cognitive roles; Affective roles; Managerial roles

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INTRODUCTION

ICT (information and communications technology) has been widely adopted in English language classes both across the world and in China. Online language learning, including Computer-assisted language learning (CALL) and blended language learning, has been increasingly prevailing over the last two decades with the popularity of the internet and the proliferation of computers both at home and in various educational settings (Compton, 2009). Researchers hold that the online context of language learning has prompted the need for new teaching approaches and teaching skills that are different from those used in teaching face-to-face language courses. (Hampel & Stickeler, 2005). No matter whether a distinct pedagogy of online learning is to emerge, the role of online teachers in the online environment needs to be explored as the extensive use of technology in classrooms inevitably leads to a redefinition of teacher and student roles (Lam & Lawrence, 2002).

Despite a multitude of publications and practices that have proposed different theoretical conceptions and general categorizations of teacher roles across various teaching and learning contexts, there is a dearth of resources on quantitative measurement of teacher roles (Alvarez, Guasch, & Espasa, 2009; Baran et al., 2011; Compton, 2009; Lam & Lawrence, 2002). This study, therefore, intends to establish an instrument that specifies

and measures more tangible facets of teacher roles from the perspectives of EFL learners in online learning.

The term online learning (OL) in this study refers to the online learning mode in a blended English course that combines both face-to-face instruction and online exercises.

1. LITERATURE REVIEW

Previous studies investigating teacher roles traverse various educational settings, ranging from traditional learning contexts (Davies et al., 2014; Feryok, 2013), international and multicultural education (Tran & Nguyen, 2015; Lee, 2011), to online learning contexts (Compton, 2009; Li & Walsh, 2010). The investigation of teacher roles also relates to different kinds of teachers such as mentor teachers and pre-service teachers (Izadinia, 2015; Koc, 2011; Wang, 2002), primary teachers (Li & Ni, 2011), university teachers (Hu & McGrath, 2011; Scott, 2013) and online tutors and teachers as well (Comas-Quinn, 2011; Donnelly, 2013).

As a result of the well-recognized importance and impact of teachers in online learning contexts, many attempts have been made to capture the constructs of online teacher roles in various ways. However, the literature has been dominated by qualitative analyses and research methods mainly include classroom observation, open-ended questions, interviews, case studies, and longitudinal studies (Baran et al., 2011; Lam & Lawrence, 2002). Very few empirical studies have developed or applied quantitative scales to measure different facets of teacher roles (Baran et al., 2011; Guasch & Espasa, 2009). Among them are Lee's study (2011), Koc's study (2011) and Wang's study (2002).

Lee (2011) examined Korean and foreign students' perceptions of the teacher's role in multicultural online learning context in Korea. The researcher investigated 248 university students with a survey questionnaire and developed a 20-item instrument based on literature review and the results of the pilot study. After statistical factor analyses, five teacher roles were identified: pedagogical, managerial, technical, affective, and differentiating, among which teacher's affective and differentiating roles were considered to be significant roles for both Korean and foreign students. Lee's development of 20-item instrument fills the gap by disintegrating larger chunks of conceptual constructs of online teacher roles into more tangible tasks that teachers carry out in online learning. Thus, the theoretical generalization of different facets of online teacher roles can be measured quantitatively and more accurately. Nonetheless, a careful look into the 20 questions of the instrument reveals that technical terms such as "establish rapport", "learning communities", and "affective support" are mixed together with common expressions such as "be patient" and "clear". Such mixed

use of jargon together with common words for daily use might prevent participants from correctly understanding and responding to the questions and thus affect the validity of the questionnaire (Dornyei, 2010, p.41).

Another quantitative measurement of teacher roles is developed by Koc (2011). By investigating 1843 student teachers in the Distance English Teacher Training Program, Koc (2011) constructed 58 items of the Mentor Teacher Role Inventory (MTRI). Principal factor analysis revealed nine factors relating to mentorship. With the KMO value of .968 and the Cronbach's value of .951, the MTRI proved to be a reliable and valid instrument. MTRI is significant in that it attempts to specify more precise tasks performed within the diverse teacher roles in online learning mode even though MTRI pertains to a particular group of mentor teachers in distance teacher training programs. Under Hudson's (2004) five-factor model for mentoring, Koc managed to generalize as many as nine factors such as providing support on teaching, orientation to the school classroom and providing feedback on lesson planning and teaching performance etc. The categorization and naming of these factors reveal that the roles of mentor teachers are obviously different from the roles of online teachers in general as the former targets at student teachers while the latter faces students instead. As a result, an instrument is necessary that can quantitatively measure online teacher roles in general and that can be applicable to more online learning situations.

A third similar study conducted by Wang (2002) looked into pre-service teachers' perceptions of the teacher's role in classrooms with computers. Wang measured teacher roles as teacher-centeredness versus student-centeredness by using an adapted survey questionnaire by Bichelmeyer, Reinhart, and Monson (1998). The study results did not generalize any categorizations of teacher roles. Instead, the findings revealed whether there was any significant difference between pre-service teachers' perceptions of teacher-centered roles and their perceptions of student-centered roles. This is rather disparate from the other research where teacher roles are classified according to their relations with students and their impact on teaching students online. The section of the survey in use that aimed at teacher roles included merely 12 items, with six items relating to teacher centeredness, and the other six items to student centeredness. In spite of the fact that these 12 items corresponded well to the specific tasks that online teachers adopt, they are too limited in numbers to constitute a valid questionnaire (Wu, 2012, p.476). In addition, the dichotomic classification of teacher roles fails to provide adequate insights for comprehensive examination of the diverse teacher roles in online learning environment.

So far, the study has reviewed relevant literature of the definitions of role, the classifications of teacher roles both in online learning modes and across various

instructional contexts as well as the findings of relevant studies centering on the development and application of quantitative measurement of online teacher roles. Overall, the review brings us to such partial conclusions: firstly, researchers all agree on the need to investigate online teacher roles as a result of the extensive adoption of online learning environment (Alvarez et al., 2009). Secondly, online teacher roles have been classified in reasonable, distinct but overlapping way (Valli & Buese, 2007). Thirdly, more precise facets of online teacher roles need to be specified and measured to fill the gap between general conceptual constructs and specific tasks that teachers perform in online learning contexts. Therefore, it is regarded as noteworthy to develop an instrument to quantitatively measure the subareas of teacher roles in online learning environment, which is the purpose of this study.

2. CONCEPTUAL FRAMEWORK

Coppola's (2002) model of online teacher roles constitutes the conceptual framework of the present study. Upon researching into the role changes perceived by university teachers as required for teaching in virtual environments, Coppola et al. (2002) were able to describe more distinctive constructs of online teacher roles: cognitive roles, affective roles and managerial roles. The cognitive role refers to teacher's engagement in deeper-level cognitive complexity of mental processes of learning, information storage, and thinking. The affective role relates to teachers' expressing emotions and influencing the relationships between students, the instructor, and the classroom atmosphere. The managerial role requires teachers to structure, manage and monitor the class, course and students in more details. Researchers (Alvarez et al., 2009; Compton, 2009, Lai et al., 2015) hold that each of the conceptualized teacher roles should be further defined with more precise set of tasks required to perform those roles, which is an issue without much consensus.

Thus, the present study, under the conceptual framework of Coppola's research, aims to develop a quantitative scale to specify more precise tasks and activities performed by teachers in online learning environment, an instrument which attempts to turn the theoretical concepts into measurable tasks in practice.

3. METHOD

In this section, the methodology of the study is described. Detailed information about the context of the study, the participants, the investigation instrument, data collection procedures will be illustrated below.

3.1 Context of the Study

The research was conducted at a university in Southern China where an online English learning program was

adopted in a blended English course. The blended English course consists of traditional face-to-face instruction and web-based online exercises. Basically, the blended English course lasts 36 weeks in one academic year and students have to complete within one week 4 periods of classroom instruction face to face with teachers and 2 periods of web-based online learning by themselves in computer rooms on campus. However, online content is also accessible after class outside the campus.

The online learning program utilized by the blended English course at the university includes various exercises ranging from listening, speaking, reading to writing. While students are doing the online exercises in the computer labs, the teacher will also be present at the same venue. In case of any questions, students can either turn to the teacher for help or communicate through virtual interaction as the online learning program also provides online learner-learner interaction and learner-instructor communication. In online learning, the teacher will not give any instruction but remain present on the spot to monitor the learning. On the contrary, the same teacher will give instruction to students in f2f learning and students will follow the teacher's guide and learn the textbooks in classrooms.

3.2 Participants

Participants were all first-year students at the same university mentioned above. Due to the same criteria for enrollment of the university, the students were of similar age (between 18-19) and had similar proficiency of English. Besides, they all attended the online English learning programs of the blended English course at the university. However, their majors were different, ranging from accounting, financial management, computer and information technology, business, law, and education. These students included the first group of 296 students who participated in a previous investigation on online English learning by the researcher, 15 students who were later selected and interviewed in the same research, 251 students for the pilot study of the tentative questionnaire of 46 items and finally the last group of 153 students who were investigated for the validation of the final version of 27-item instrument.

As to the selection of the participants, the several groups of students were random sample subjects as a result of their voluntary participation in the research. After the researcher made clear the nature and purpose of the academic research to both teachers and students class by class, those teachers and students who agreed to take part in the study were then investigated.

To ensure its reliability and validity, the investigation needs to meet many requirements and undergo numerous processes. Foremost, the primary concern is the sample size. Researchers (Koc, 2011) seem to have various parameters as to the sample size of quantitative studies. Some suggest that the sample size should be in a range

of 1%-10% of the population and a minimum of 100 participants is needed for multivariate statistical procedures such as factor analysis (Dornyei, 2010, p.62). Following this guideline, 251 participants in the pilot study in this investigation make a valid sample size as the total annual enrolment of the university is around 4,000. Another suggestion by researchers (Gorsuch, 1983; Wu, 2012, p.207) about sample size is that the number of sample subjects should be 5 times of the number of items in the questionnaire. In this investigation, the total number of the participants in pilot study is 251, more than 5 times of the 46 items in the tentative questionnaire and the total number of participants in the main study is 153, also 5 times of the 27 items in the final instrument. Data in both studies indicate a valid sample size of the investigation.

3.3 Instrument

A previous investigation by the researcher to examine university students' perceptions on various facets of online learning required 296 participants to respond to the open-ended question on teacher roles. Later, 15 students were selected and interviewed. The scenario of the responses by the participants to the open-ended question and the transcripts of the interview made one of the sources for the construction of the first tentative questionnaire of 46 items. Then the tentative version of 46-item questionnaire was classified into three main groups under the conceptual framework of Coppola's research (2002) and then administered to 251 students for the pilot study. After item analysis, exploratory factor analysis and reliability test of the results of pilot study, a final version of 27-item instrument was constructed and then administered again to a group of 153 students to test its validity.

3.4 Procedures of Developing the Questionnaire

The purpose of this present study is to develop a quantitative instrument to measure the more specific tasks relating to the constructs of teacher roles in online English learning context. The previous review of online teacher roles shows that there is not much consensus on the more precise sets of tasks within different conceptualized online teacher roles. Therefore, the two main sources for constructing the items in the questionnaire lie in both the previous qualitative research of online teacher role theory as well as the scenario of the responses to the open-ended question and interview transcripts by university students.

Initially, to develop the item pool, both qualitative and quantitative studies in the field of online teacher roles (Alvarez et al., 2009; Baran et al., 2011; Coppola et al., 2002; Compton, 2009; Lee, 2011) were reviewed to develop reasonable and distinct tasks pertaining to the three main constructs of online teacher roles by Coppola (2002).

Next, in a previous investigation by the researcher, the participants were required to articulate their

understandings of the roles of their teachers in online courses:

What do you think of the role of the teacher in the online course?

The scenario of the open-ended question and the follow-up interview in the previous research were transcribed and later examined carefully to find their possible themes. The present study used coding categories determined by the conceptual framework of Coppola et al. (2002) and extracted three themes of all those responses. Below is a list of some examples of participants' responses either to the open-ended question or in the interview:

- a) *explain new words*
- b) *help to correct mistakes*
- c) *highlight focus*
- d) *help with technical problems*
- e) *monitor the class*
- f) *teach how to learn*
- g) *push students to keep learning*

...

Thirdly, based on the theoretical review of the previous studies and the scenario of participants' perceptions on online teacher roles, the researcher developed the tentative questionnaire of 46 items—the Scale of Teacher Role Inventory (STRI). Since a valid questionnaire requires simple and natural language rather than heavy-loaded inductive jargons (Dornyei, 2010, p.41), the researcher modified the wordings to describe each task relating to the three online teacher roles. Common words and complete but simple sentences are used to ensure more accurate understanding of participants and to trigger more truthful and thoughtful answers from the students. Some of the examples are listed below:

- a) *The teacher helps students to overcome misunderstandings.*
- b) *The teacher helps students to analyze the learning content.*
- c) *The teacher encourages students to express their feelings in English.*

...

Additionally, some of the statements in the questionnaire were also provided with short notes of explanations in Chinese even though the words and sentences are considered to be simple and easy enough for university students.

To further ensure the validity of the questionnaire, the researcher also deliberately designed a reverse item – item 31, of which the meaning is opposite to one of the previous items). The purpose of reverse item in an instrument is to test whether the participants have responded to the questions consistently. Usually it is common for an instrument to have 1-3 such reverse items to ensure the validity and reliability of the questionnaire. Such reverse item will have to be scored reversely

when the data is input for statistical analysis (Akbari & Tavassoli, 2014; Wu, 2012, p.164). Thus, disagreement by a respondent to item 31 indicates that the teacher makes the student feel relaxed rather than stressed while learning English.

The fourth procedure of the study is to administer the tentative questionnaire to 251 university students. Questionnaires were first distributed to participants in computer rooms where they did the online exercises and then collected by the researcher right after they were finished. Participants were assured that the investigation was conducted solely for the purpose of academic research and would not affect their assessment in any way so that they could respond to the questionnaire truthfully. Data was then input in computer for statistical analysis with SPSS software. After item analysis and exploratory factor analysis, the final version of 27-item instrument was constructed and the reliability test shows that it is a reliable instrument.

Finally, to further validate this 27-item instrument, the questionnaire was administered to a different group of 153 university students in the same online English learning environment. The second reliability test shows that this Scale of Teacher Role Inventory (STRI) is a valid and reliable instrument to quantitatively measure the more precise tasks relating to online teacher roles.

All the investigation, along with the interview, were conducted near the end of one academic year when participants were supposed to have learnt the online English courses for two semesters and when they were supposed to have a comparatively complete view of both the courses and their teachers.

4. RESULTS

4.1 Results of Item Analysis

After data of pilot study is collected, it is necessary to conduct statistical analyses such as item analysis, validity test and reliability test to develop the final version of the instrument. Item analysis serves to test the commonalities both between each item in the questionnaire and the whole instrument and also among all the items. Usually, some items would be deleted if they are not valid enough (Wu, 2012). In order for an item to be valid, its *pearson* coefficient value should be above .04 ($p < .05$) (Wu, 2012, p.192). Results showed that all the 46 items in pilot study ranged from .425 to .698 ($p = .000$, $N = 251$) and were above .04 ($p = .000$, two-tailed $< .05$). Therefore, all the items were kept to run further factor analysis.

It must be noted that item 31 is a reverse item and has been reversely scored, which justifies its minus coefficient value (-.603). This is the same with the coefficients of item 31 in all the following statistical analyses below.

4.2 Results of Factor Analysis

Before factor analysis, Kaiser-Meyer-Okin's test and Bartlett's test of sphericity are often used to determine whether or not factor analysis is suitable for a particular set of data. The KMO measure can range between 0 and 1. Values above 0.6 on a sample size over 250 are considered to be acceptable and thus indicate that the questionnaire is suitable for factor analysis. Values above 0.9 are regarded as excellent and perfect for factor analysis (Wu, 2012). In this study, KMO value is 0,938 and Bartlett's test of sphericity revealed an approximate chi-square value of 6417.655 on 1035 degrees of freedom with a significance value of .000. The results indicated that the correlation matrix had significant correlations and the 46-item questionnaire in the pilot study is very suitable for factor analysis.

Factor analysis is then conducted to test the construct validity of a questionnaire and to what extent the questionnaire can measure the conceptual constructs in question. By using SPSS 18.0 for Windows, the researcher conducted exploratory factor analysis in an attempt to classify the 46 items corresponding to constructs by Coppola et al. (2002). First, the principal component analysis of the 46 items revealed the presence of three factors with eigen values exceeding 1. This explained 37.205%, 4.977%, 4.479% of the variance, respectively.

Further analyses helped the researcher to delete items either loading on irrelevant factors or with less appropriate factor loadings (Akbari & Tavassoli, 2014; Wu, 2012). According to some researchers (Koc, 2011), an item with a load above 0.3 is acceptable. Others claim that loadings less than 0.4 or 0.55 should be suppressed in the data (Domyei, 2010). While in the present study, items that loaded on irrelevant factors were first excluded and then items with factor loadings lower than 0.5 were deleted (Wu, 2012, p.484). These items made no contribution to the constructs and acted as sources of error and were therefore deleted to create more robust results. Consequently, a total of 19 items had been eliminated from the tentative questionnaire, leaving 27 items in the end. Table 1 listed the results of factor analysis of the final 27-item questionnaire.

As seen from Table 1, the total values of current items in the scale ranged between .527 and .771, which meant that the reliability assumptions were met. The three factors explained 39.479%, 6.491%, 6.297% of the total variance of the whole instrument respectively.

To sum up, the results of item analysis and exploratory factor analysis revealed that there are three main components in the STRI corresponding to the conceptual framework by Coppola et al. (2002). In particular, cognitive roles and affective roles both have 10 items while managerial roles comprise 7 items:

Cognitive roles: item 1-10

Table 1
Rotated Component Matrix of Factor Analysis on the 27 Items of the Questionnaire in Pilot Study

Items and factors	Factors		
	1	2	3
Factor 1: Cognitive roles (39.479% of the total variance)			
2.	.719		
5.	.718		
8.	.681		
4.	.660		
7.	.654		
1.	.617		
6.	.604		
3.	.597		
9.	.580		
10.	.574		
Factor 2: Affective roles (6.491% of the total variance)			
11.		.685	
15.		.684	
17.		.656	
14.		.635	
13.		.629	
16.		.597	
12.		.595	
19.		-.567	
20.		.561	
18.		.553	
Factor 3: Managerial roles (6.297% of the total variance)			
26.			.771
25.			.677
23.			.664
21.			.598
27.			.586
24.			.568
22.			.527

Affective roles: item 11-20

Managerial roles: item 21-27

Hence, a final version of 27-item instrument was developed with three components of cognitive roles, affective roles and managerial roles, each of which comprises certain number of precise tasks.

Following the validity test above, reliability test of the pilot study was conducted. In social sciences, it is necessary to provide both the Cronbach Alpha value of the entire instrument and the respective Cronbach Alpha values of each component in the instrument. Generally speaking, an instrument with value above .70 is acceptable and one with value above .90 indicates

excellent reliability. Furthermore, components with Cronbach Alpha values above .60 are acceptable and one with value above .80 is considered to be pretty good (Wu, 2012, p.244).

In this investigation, the Cronbach Alpha value of the entire 27-item scale was .924, which suggested a pretty high reliability. Table 3 shows the respective Cronbach Alpha Values of the three components, along with the alpha value of the overall instrument.

As revealed in Table 2, the Cronbach Alpha values of both the overall questionnaire and the three components all exceeded .70, indicating that the Scale of Teacher Role Inventory (STRI) is a highly valid and reliable instrument.

Table 2
The Cronbach Alpha Values of the 27-Item Questionnaire in Pilot Study

	The overall 27-item instrument	Factor1 cognitive roles	Factor 2 affective roles	Factor3 managerial roles
Cronbach Alpha value	.924	.896	.779	.841

4.3 The Results of Main Study

To crosscheck the reliability of the final 27-item scale, the instrument was administered to a different group of 153

students in the same online English learning environment at the same university. The Cronbach alpha values of both the entire scale and its three components were listed in Table 3.

Table 3
The Results of Cronbach Alpha Values of the STRI in the Main Study

	The overall 27-item instrument	Factor1 cognitive roles	Factor 2 affective roles	Factor3 managerial roles
Cronbach Alpha value	.955	.932	.891	.899

Obviously, the Cronbach alpha values of the overall instrument and the three components all went above .800 and reached an excellent level, which suggested that the Scale of Teacher Role Inventory (STRI) is a valid and reliable instrument to measure online teacher roles in relation to their specific tasks that teachers need to perform in practice.

to be included as students are found to incorporate technological resources recommended and shared by teachers (Gray, Chang, & Kennedy, 2010) and the types of activities students engage in are also affected by teachers' advice on what technologies to use and how to use them (Lai et al., 2015)

DISCUSSION

In this section, each subscale of the STRI, along with their precise tasks specified, is discussed in relation to Coppola's categorization (2002) of online teacher roles and also other conceptualizations and findings in related literature.

In fact, specific tasks in the subarea of cognitive roles prove rather limited in the previous studies. For example, the cognitive role is absent in Lee's (2011) categorization of online teacher roles and development of the relevant tasks. Besides, tasks within cognitive construct developed in the previous studies are sometimes considered to be quite general and vague or even overlapping with the tasks under other conceptual components. For instance, among the group of tasks proposed by Alvarez et al (2009), learning guidance and evaluation that influence interaction on the web is classified under cognitive roles whereas similar tasks related to interaction is grouped under affective roles in the present study. So are some other tasks like providing strategies as to how to drive a virtual classroom. Furthermore, tasks in the present study such as "with the explanation of the teacher, the focus of the materials becomes clearer", "the teacher makes comments on students' work", and "the teacher gives students advice on doing exercises" are regarded as more specific than tasks such as "validation of knowledge" and "tutoring over the Internet" developed in previous research (Alvarez, 2009). Hence, the 10 tasks that comprising cognitive roles are more informative and reveal more specific characteristics concerning the cognitive aspects of online teacher roles. This factor is the most important one of the three components of the STRI. It explains 39.479% of the total variance of the whole instrument, which indicates that students perceive that the major responsibility of an online teacher is to help them to learn English by gaining the language knowledge and practicing the language skills. It also suggests that learners place priority on cognitive learning, which naturally makes the cognitive facet the primary concern among the roles of online teachers.

The first factor of STRI is "cognitive roles". It comprises as many as 10 tasks such as "the teacher helps students to overcome misunderstandings", "the teacher helps students to analyze learning content" and "the teacher helps students to correct mistakes" etc. According to Coppola et al (2002), since technology has contributed to deeper mental learning process such as reasoning, analyzing and reflecting on the part of students, so should online teachers. Efforts are, therefore, made by online teachers to result in tasks such as editing both questions and response to questions as well as assisting students to analyze information etc. The precise tasks of cognitive roles in this study also echo to Subramaniam's study (2010) where similar activities of online teachers were found to assist students to construct content knowledge. Examples of such activities include posing questions, comprehending, readdressing students' explanations and so forth.

Many researchers hold that students need the support from their teachers in terms of using technology resources in effective manner (Comas-Quinn, 2011; Lai et al., 2015; Lam & Lawrence, 2002). Unlike the other studies that have highlighted a distinct category of technological roles of online teachers (Alvarez et al., 2009; Baran et al., 2011; Lee, 2011; Subramaniam, 2010), specific tasks concerning technological roles were instead categorized under cognitive roles in this study: "The teacher uses videos to help students to learn English", "the teacher uses audios to help students to learn English" and "the teacher recommends various websites / web pages to students to learn English". These specified tasks are necessary

As to factor 2 of affective roles, teaching behaviors in this subarea include "the teacher leads students to play games to learn English", "the teacher encourages students to express their feelings in English", and "the teacher encourages students to exchange ideas in English" etc. According to Coppola et al. (2002), this affective

aspect of online teacher roles is concerned with instructor behavior affecting students' relationship with the teacher, with other students and the virtual classroom atmosphere. Many researchers have attempted to discuss, define and disintegrate affective roles of online teachers in different ways (Baran et al., 2011). To be more exact, teachers need to co-exist in the virtual classrooms to make the learning environment less distant. And to establish group rapport and encourage full participation from students, building a learning community is necessary (Donnelly, 2013). Once online teachers succeed in fostering an online community, students tend to learn more and feel closer to each other and to instructor compared to traditional classroom settings (Compton, 2009).

A number of suggestions have been made by researchers as to how to fulfill the affective roles in various ways. To mention just a few examples here: roles of catching students' attention on learning with the "powerful imageries" generated by computers (Subramaniam, 2010); responsibilities of humanizing the learning environment and facilitating and encourages interaction (Moore & Kearsley, 1996); strategies to build online community and to promote communicative competence and online interaction (Compton, 2009); tasks to identify agreement / disagreement, prompting discussion, drawing in participants, setting climate for learning, communication in virtual classroom, creating a positive community where technology use can be promoted and strengthened (Alvarez et al., 2009; Lai et al., 2015).

As a whole, these studies have offered more insights to specific tasks in the subscale of affective roles, which make a solid basis for the description of more accurate tasks pertaining to affective aspects of online teachers. Therefore, tasks like "the teacher brings students closer to each other", "the teacher helps students to stay focused", "the teacher makes English learning interesting to me" and "the teacher brings up different topics for discussion" etc. are more descriptive and revealing than general descriptions of "give affective support, establish rapport, develop learning communities and be social" (Lee, 2011), which are more a matter of conceptual constructs rather than actual behavior in practice. 10 tasks of affective roles make the second most important factor of the role inventory, explaining 6.491% of the total variance of the whole instrument. Such findings reveal that no matter how technology has developed and changed the learning environment, the affective aspects of both instructors and learners as human beings could never afford ignoring. While technology may change the learning media and the physical learning environment dramatically, researchers should always take into account the intrinsic affective needs of whatever roles involved in the learning / teaching contexts. In other words, the significance of affective roles of online teachers lies

in the need to create an effective learning environment for promoting meaningful learning among students and the 10 tasks of affective roles specified in this study are among some of the recommended steps to realize this goal.

Last but not least, the third factor of the STRI is managerial roles, which are related to instructor behavior of course planning, organizing, leading and controlling (Coppola et al., 2002). Tasks exemplifying the subscale in this study are "The teacher sets up rules and regulations for doing activities", "The teacher disciplines the class", and "The teacher keeps a record of students' exercises" etc. Similar to cognitive roles, managerial roles have also been sufficiently discussed in theoretical conceptualizations but less quantitatively examined in relation to their specific tasks (Baran et al., 2011; Lam & Lawrence, 2002). Mixed synonymous terms are adopted for similar broad propositions of managerial roles. For instance, "facilitator" (Coppola et al., 2002), "administrator" (Bawane & Spector, 2009), "process facilitator", "instructional designer", "material producer" (Aydin, 2005), and "manager" (Goodyear et al., 2001) etc. No matter how differently managerial roles are named by theorists, the tasks in this subarea seem to be more consistent than those in the former factors. The following are some of the examples: choosing and adapting resources to create online language materials and tasks, applying language learning theories or curriculum design frameworks for online language learning (Compton, 2009); gathering and organizing materials into digital or other media formats (Coppola et al., 2002); managing a virtual learning environment, managing the shared mailboxes, monitoring the delivery of complementary content in an online format (Alvarez et al., 2009) etc. The total 7 tasks identified under managerial roles of online teachers in the present investigation correspond quite well to those previous studies. More examples are "the teacher adapts the exercises to meet students' needs", "the teacher plans teaching schedule" and "the teacher controls learning pace" etc. Again, in contrast to the vague categorizations of tasks like "be patient, be clear and don't overload" (Lee, 2011), tasks summarized in this study appear more relevant to its conceptual constructs defined by the theorists. This is further validated by the fact that factor 3 of managerial roles explained 6.297% of the total variance of the whole STRI. Although this set of tasks of managerial roles is unlikely to exhaust all the possible behavior in similar contexts, it is a significant step to generalize related activities of teaching practice in online learning settings. At least, these tasks make some practical and down-to-earth guidelines for classroom instructors to deal with the challenging problems of managing computer laboratory classrooms or virtual learning environment.

CONCLUSION

The primary purpose of the study is to develop and validate an instrument to quantitatively measure online teacher roles based on the perceptions of EFL learners in an online English learning environment. The three constructs that comprise the tentative questionnaire are conceptualized by Coppola's (2002) theoretical framework of online teacher roles. Then based on literature review of both the previous qualitative and quantitative studies and the scenario of open-ended question and interview by university students, the Scale of Teacher Role Inventory (STRI) of 46 items were developed for pilot study and 27 items were eventually determined for the scale. A series of statistical analyses and a final main study show that the STRI is a pretty valid and reliable instrument to quantitatively measure online teacher roles.

The study is significant because it endeavors to fill the gap between theoretical conceptualizations of online teacher roles and the specific tasks and actual behavior of online teachers in practice. It is also noteworthy in that the STRI serves to provide down-to-earth directions and guidelines for the practices of instructors in either physical or virtual classrooms so that they can adjust their pedagogy to the dramatic changes triggered by ICT. The third implication of the research then lies in that it might be a challenge for both theorists and practitioners to examine whether the instructors have fulfilled the required responsibilities. Findings from the use of the STRI thus help to stimulate discussions and reflections on how well the instructors have realized those tasks against relevant theoretical constructs. It then makes a practical tool of performance-evaluation for online teachers.

Regardless of its implications of for teaching, the results of the study carry with them some limitations. Considering the extensive adoption of computer and information technology in all fields of teaching and learning, the particular group of EFL learners investigated in the present research is limited and a more heterogeneous body of sample subjects are supposed to be investigated so as to ensure greater generalizability. Moreover, the present study merely incorporated perceptions from learners and have left out the voices of online teachers, who are regarded as a pivotal role of practicing online technology and pedagogy.

Researchers have commonly agreed that learners are not passive recipients of knowledge, neither are teachers. Teachers should not simply accept the roles and competencies designated by authorities without critically reflecting on their roles and all the assumptions (Baran et al., 2011). Consequently, as a measure to empower teachers, voices from instructors should be investigated and brought to the forefront of in the research. Further research, therefore, should first incorporate the opinions and beliefs of online teachers to triangulate the findings of studies in the field. Then, detailed investigation is also

necessary to compare and contrast teacher roles across different educational settings, ranging from traditional learning to blended learning and online learning contexts. It is believed that exploring more accurate roles changes of online teachers will shed light on the complex relationship between technologies, pedagogies and the content knowledge and thus bring forth better integration of technology into pedagogy.

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APPENDIX

The Scale of Teacher Role Inventory (STRI)

Dear Students,

The purpose of this survey is to find out your beliefs of teachers' roles in online English learning. The questionnaire is not a test and there is no "right" or "wrong" answer to all the questions. The results of the investigation will be used only for research purposes so please give your answers truthfully to ensure the success of the survey. Thank you very much in advance for your cooperation!

Name: _____

Major: _____

Which year at university: _____

Instruction:

Please circle a number from 1-5 to tell us how much you agree or disagree with the following statements.

Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1	2	3	4	5

Teacher roles	in	online English learning
1. The teacher uses videos to help students to learn English.		1 2 3 4 5
2. The teacher uses audios to help students to learn English.		1 2 3 4 5
3. The teacher recommends English websites/web pages to students to learn English.		1 2 3 4 5
4. With the explanation of the teacher, the focus of the learning materials becomes clearer.		1 2 3 4 5
5. The teacher helps students to overcome misunderstandings.		1 2 3 4 5
6. The teacher helps students to analyze the learning content.		1 2 3 4 5
7. The teacher makes comment on students' work.		1 2 3 4 5
8. The teacher gives advice on doing exercises.		1 2 3 4 5
9. The teacher helps students to correct mistakes.		1 2 3 4 5
10. The teacher shows students the right direction of doing activities.		1 2 3 4 5
11. The teacher leads students to play games to learn English.		1 2 3 4 5
12. The teacher encourages students to express their feelings in English.		1 2 3 4 5
13. The teacher encourages students to exchange ideas in English.		1 2 3 4 5
14. The teacher brings students closer to each other.		1 2 3 4 5
15. The teacher helps students to stay focused.		1 2 3 4 5
16. The teacher encourages students to explore answers on their own.		1 2 3 4 5
17. While learning English, I feel confident of myself because of the teacher		1 2 3 4 5
18. The teacher makes English learning interesting to me.		1 2 3 4 5
19. The teacher makes English learning stressful to me.		1 2 3 4 5
20. The teacher brings up different issues for discussion.		1 2 3 4 5
21. The teacher makes learning plan for students.		1 2 3 4 5
22. The teacher makes teaching schedule in class.		1 2 3 4 5
23. The teacher controls learning pace.		1 2 3 4 5
24. The teacher disciplines the class.		1 2 3 4 5
25. The teacher sets up rules and regulations for doing activities.		1 2 3 4 5
26. The teacher keeps a record of students' exercises.		1 2 3 4 5
27. The teacher adapts the exercises to meet students' needs.		1 2 3 4 5