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# Perceived Teacher Support in Online Literature Reading: Scale Development, Validation, and Prediction of Continuous Reading Intention

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**Abstract:** This study aims to develop a scale to measure perceived teacher support in online literature reading (PTSOLR) and explore the relationship between PTSOLR and postgraduates' continuous reading intention (CRI). Two hundred and fifty-seven postgraduates from Chinese mainland were investigated. Exploratory factor analysis (EFA) was used to clarify the factor structure of PTSOLR, and multiple regression analysis was performed to illustrate the predictive effect of PTSOLR on CRI. Through EFA, four factors with 20 items were identified, which are emotional support (ES), methodological support (MS), autonomous support (AS) and instrumental support (IS). The results of multiple regression analysis showed that teachers' ES and AS can positively predict students' CRI. The pedagogical implications of this finding are discussed and suggestions for teachers are made.

**Keywords:** Perceived teacher support, literature reading, scale development, continuous reading intention

## 1. Introduction

Reading ability is an essential skill for talents in the 21st century. In recent years, technology-assisted reading model has been proved to be able to greatly improve students' reading effect (Marino, 2009; Svensson et al., 2021). Benefiting from this background, postgraduates' literature reading has been completely converted from traditional paper reading to electronic reading, and online literature reading brought them a new experience different from the past.

Because of the profound content and language barrier, literature reading has always been a difficult reading activity for postgraduates. According to a survey of Chinese postgraduates, most of them read literature only at the work tasks and writing papers stages (Mao et al., 2020), which indicated that the postgraduates' literature reading intention was not high as a whole. The reason was that students generally believed that their literature retrieval and reading skills were inadequate (Mao et al., 2020), resulting in reading barriers. As a result, these postgraduates cannot produce high-quality research achievements because of their small reading volume.

Teachers have trained postgraduates' reading skills through the literature reading course (e.g., Xu et al., 2019). However, there is no empirical study on perceived teacher support in online literature reading (PTSOLR). In order to make up for this lack of research, this study developed a scale to measure PTSOLR and explored the predictive effect of PTSOLR on students' continuous reading intention (CRI). It is expected that the research results can support teachers to improve their guidance of online literature reading, and ultimately enhance postgraduates' CRI.

## 2. Literature Review

### *2.1 Perceived teacher support in online literature reading*

Perceived teacher support is the guidance and assistance that students experience from teachers in their daily learning and life, which is beneficial to student learning (Ma, Luo, & Xiao, 2021). Perceived teacher support can positively affect students' reading achievement (Ma et al., 2021). For postgraduates, the most frequent reading activity is online literature reading. Teacher support in online literature reading is the guidance and assistance given by teachers in the process of online literature reading activities composed of literature retrieval, intensive reading, reporting and discussion, etc.

Much literature reported on the importance of the teacher's role in postgraduates' literature reading. For example, a study on Chinese postgraduates found that teachers' high knowledge level and heuristic teaching will enable students to obtain better learning effect in literature reading course (Xu et al., 2019). However, PTSOLR is not fully discussed as an academic concept at present. The reason may be the lack of a quantitative measurement tool. Therefore, it is necessary to develop a measuring tool to advance the research progress.

### *2.2 Classical Theories Related to PTSOLR*

Although PTSOLR has not been formally proposed before, there have been rich achievements in the research of perceived teacher support and online reading, from which several related classical educational theories can be extracted to provide a theoretical basis for the research of PTSOLR.

#### *2.2.1 Self-determination Theory*

Self-determination theory was proposed by Deci and Ryan in 2000 to explain the degree to which humans decide their own behavior (Ryan & Deci, 2000). It divides human behavioral motivation into external motivation, internal motivation and non-motivation. When the three basic human needs for autonomy, competence and relatedness are satisfied, they tend to show strong intrinsic motivation.

Appropriate teacher support can meet students' three basic needs, and then enhance their intrinsic learning motivation. For example, the research has demonstrated that teachers' autonomy support will stimulate students' intrinsic reading motivation (De Naeghel et al., 2014), leading to stronger reading intention. Besides, teachers' care and profitable feedback can meet students' needs for relatedness, thus triggering their autonomous motivation and interest (Bieg, Rickelman, Jones, & Mittag, 2013; Lou & Noels, 2020). In addition to teachers, students are also able to offer each other support through collaborative learning (van Leeuwen, Hornstra, & Flunger， 2020).

#### *2.2.2 Metacognition Theory*

Metacognition, which refers to the cognition of cognition, has always been a research hotspot. Generally speaking, metacognition includes conditional knowledge, declarative knowledge and procedural knowledge. Students' high metacognitive ability will greatly benefit their learning.

Teachers' behavioral supports for students can cultivate their metacognitive knowledge (Kim & Stormont, 2020). In the classroom, metacognitive reading strategy instruction can improve students' reading comprehension ability and reading achievement (Teng, 2020), while metacognitive deficiency may cause reading difficulty (Wang, Li, & Chung, 2021). Furthermore, teachers can also provide metacognitive support to students through dialogic talks (Zepeda, Hlutkowsky, Partika, & Nokes-Malach, 2019), thus urging students to improve their learning methods.

#### *2.2.3 Cognitive Tool Theory*

Cognitive tools, originated from constructivism theory, refer to the computer technology or equipment that can promote students' cognitive development. Cognitive tools can assist students in the process of knowledge construction, which is conducive to the development of their high-level thinking skills.

In the field of online reading, cognitive tools can replace part of teachers' role. Teachers often use scaffolding to promote students' understanding of words and reasoning, and cultivate students' reading comprehension ability (Rojas Rojas, Meneses, & Sanchez Miguel, 2019). Cognitive tools can act as scaffolding to support students' independent reading and knowledge construction. When using

cognitive tools, students with reading difficulties will achieve better reading performance (Marino, 2009). Therefore, teachers can provide students with cognitive tools to improve students' reading initiative.

### *2.3 the Influence of Teacher Support on Students' Learning Intention*

Teacher support has a positive and significant effect on university students' learning intention (Descals-Tomas, Rocabert-Beut, Abellan-Rosello, Gomez-Artiga, & Domenech-Betoret, 2021). Perceived teachers' inadequate supports in autonomy, competence, and relatedness can lead to weak motivation, which hinders students' efforts and future intention to participate in learning (Shen, Li, Sun, & Rukavina, 2010). In turn, university students show high levels of study engagement and low levels of burnout and boredom if they received emotional support from the teacher (Pap, Virg, Lupsa, & Crasovan, 2021).

In addition, perceived teacher support is conducive to cultivating students' creative self-efficacy (Liu, Gong, Zhang, Yu, & Zhou, 2021). Students with higher creative self-efficacy are more confident in scientific research, so they may be more willing to read literature to provide support for scientific research. Therefore, students who perceive more teacher support in online literature reading may have higher continuous reading intention (CRI).

### *2.4 Research Questions*

The above analysis suggests that PTSOLR is important for students' literature reading, but the lack of measurement instruments leads to few research findings. PTSOLR may affect students' CRI, but its effect is still unclear. Therefore, this study aims to develop an instrument for measuring students' PTSOLR and explore the relationship between PTSOLR and students' CRI. Specific research questions are as follows:

1. What are the dimensions of perceived teacher support in online literature reading (PTSOLR)?
2. Is the factor structure and items of PTSOLR and CRI valid and reliable?
3. Can PTSOLR predict CRI of students? Which dimensions have a significant predictive effect?

## 3. Methodology

### *3.1 Sample and Data Collection*

Using convenient sampling method, 257 postgraduates in Chinese mainland (male = 107, female = 150; grade one = 139, grade two = 70, grade three = 48) participated in the survey. Most of their universities have a good atmosphere for scientific research. Their majors are widely distributed, covering most of the disciplines offered in Chinese mainland. The electronic questionnaire was produced and subsequently distributed in multiple WeChat groups. In order to increase participation and improve data quality, many equal red packets were distributed along with the questionnaire link.

### *3.2 Scale Development*

Guided by the three educational theories discussed in the above review, the PTSOLR scale was developed. Firstly, the PTSOLR was divided into five sub-dimensions. On the basis of the educational significance of the three theories, the connotation of the sub-dimensions was determined and then specific items were developed. The descriptions are as follows:

(1) **Emotional support (ES):** Based on the need for relatedness in self-determination theory, it refers to the teachers' emotional care to students and their support in constructing students' positive emotions in online literature reading activities. An example of the items is 'When discussing the contents of the literature, teachers will respect my views'.

(2) **Social support (SS):** Based on the need for relatedness in self-determination theory, it refers to the work teachers do to promote social interaction in literature reading activities, including offline and

online. An example of the items is 'Due to the organization of teachers, I often cooperate with my peers to read and report literature'.

(3) **Autonomous support (AS):** Based on the need for autonomy in self-determination theory, it refers to teachers' efforts to encourage students to develop and adhere to autonomy in online literature reading activities. An example of the items is 'Teachers expect me to question the authority and look at the literature critically'.

(4) **Methodological Support (MS):** Based on metacognition theory, it means that teachers teach students methods and strategies related to online literature reading to develop students' metacognitive skills. An example of the items is 'Teachers guide me to make a plan before reading the literature'.

(5) **Instrumental Support (IS):** Based on cognitive tool theory, it refers to the cognitive tools provided by teachers to meet students' needs in the process of online literature reading. The cognitive tools are computer software or programs that can assist learning. An example of the items is 'Teachers introduce me the tools that can improve my efficiency of reading literature (such as software that can translate languages or plan schedules, etc.)'.

Subsequently, several experts and postgraduates were invited to give comments on the initial version. According to their feedback, items that ambiguous and irrelevant were modified or deleted. Finally, the PTSOLR scale consisted of five subscales, each of which included 5 items.

The CRI scale was formed by adapting the learners' continuance intention (LCI) factor developed by Zhou (Zhou, 2017) and behavioral intention (BI) factor developed by Liaw (Liaw, 2008). It composed of one subscale with 5 items.

### *3.3 Data Analysis*

According to the research questions, two kinds of data analysis method were mainly applied. In response to research questions 1 and 2, exploratory factor analysis was performed to elucidate the factor structure of PTSOLR. Principal component analysis was used as the factor extraction algorithm and the varimax method was adopted to further rotate factors. Items with rotated factor loading greater than 0.5 were retained. In response to research question 3, we conducted correlation and regression analysis to explore the predictive effect of PTSOLR on CRI. The regression equation was constructed with factors of PTSOLR as predictors and CRI as outcome variable.

## 4. Results

### *4.1 Exploratory Factor Analysis*

Cases with extreme values were excluded based on the z-score, so that all items meet the normality. Then exploratory factor analysis (EFA) for PTSOLR and CRI was carried out.

Table 1 shows the EFA results for PTSOLR, a total of 4 factors were revealed, that is 'Emotional Support (ES)', 'Methodological Support (MS)', 'Autonomous Support (AS)' and 'Instrumental Support (IS)'. The rotated factor loadings of the items of these four factors were all greater than 0.50, so all items were retained. But items of Social Support (SS) failed to constitute the factor. The Cronbach coefficients of the four factors were between 0.78 and 0.91, and the overall Cronbach coefficient was 0.93. It could explain the total variance of 67.40%, which showed that the reliability of the scale was satisfactory. In a word, the above data suggests that the developed scale is a qualified tool for measuring perceived teacher support in online literature reading.

The mean (M) and standard deviation (SD) of the four factors of PTSOLR in Table 1 showed that autonomous support (M = 5.83, SD = 0.76) scored the highest, followed by emotional support (M = 5.64, SD = 0.89) and methodological support (M = 4.96, SD = 1.23), and instrumental support (M = 4.67, SD = 1.33) scored the lowest. This suggested that in online literature reading activities, postgraduates can perceive more teachers' guidance on autonomy and emotion, but lack of learning methods and auxiliary tools and software.

Table 1. *Rotated Factor Loadings, Cronbach's Alpha Values and Descriptive Statistics for the Four Factors of PTSOLR*

| Factors | Item loading |
|---|---|
| Factor 1: Emotional Support (ES), α = 0.87, Mean = 5.64, SD = 0.89 | |
| 1. Teachers' expectation and confidence make me believe that I can do well in literature reading. | 0.69 |
| 2. Teachers encourage me to express my opinion on the literature I read. | 0.73 |
| 3. In the process of reading literature, teachers praise and affirm my outstanding performance (such as finding good literature and expressing novel views, etc.). | 0.83 |
| 4. When I report the literature, teacher' s advice can help me build up my self-confidence. | 0.82 |
| 5. When discussing the contents of the literature, teachers will respect my views. | 0.69 |
| Factor 2: Methodological Support (MS), α = 0.91, Mean = 4.96, SD = 1.23 | |
| 1. In the process of reading literature, teachers give me guidance on methods, such as methods of searching literature, downloading literature, reading literature intensively and managing time. | 0.63 |
| 2. Teachers design literature reading tasks to make me use these methods proficiently. | 0.73 |
| 3. Teachers guide me to make a plan before reading the literature. | 0.76 |
| 4. In the process of reading literature, teachers will discover and correct my improper methods in time. | 0.79 |
| 5. In the process of reading literature, teachers will guide me to summarize and improve various methods. | 0.75 |
| Factor 3: Autonomous Support (AS), α = 0.78, Mean = 5.83, SD = 0.76 | |
| 1. When assigning literature reading tasks, teachers tend to clarify the reading direction rather than designate the literature directly. | 0.60 |
| 2. Teachers expect me to think hard in the process of reading literature. | 0.77 |
| 3. Teachers expect me to question the authority and look at the literature critically. | 0.67 |
| 4. Teachers guide me to read literature with purpose. | 0.67 |
| 5. Teachers guide me to find my research direction in the process of reading literature. | 0.70 |
| Factor 4: Instrumental Support (IS), α = 0.89, Mean = 4.67, SD = 1.33 | |
| 1. Teachers recommend or provide platforms to help me share and exchange literature with my peers (such as WeMeet and WeChat Group, etc.). | 0.55 |
| 2. Teachers introduce me the tools that can improve my efficiency of reading literature (such as software that can translate languages or plan schedules, etc.). | 0.84 |
| 3. Teachers introduce visualization tools to help me sort out the contents of literature (such as concept maps, mind maps, flow charts and other mapping methods or software ). | 0.85 |
| 4. Teachers introduce literature management tools to help me manage literature, (such as NoteExpress, Endnote, E-Study, etc.). | 0.83 |
| 5. Teachers introduce bibliometric tools to help me analyze research hotspots and trends (such as CiteSpace and visual analysis functions in CNKI, etc.). | 0.76 |
| Overall Alpha: 0.93 | |
| Total Variance Explained: 67.40% | |

As for CRI scale, a factor including 5 items was generated. The factors' Cronbach coefficient was 0.89, and it could explain the total variance of 69.79%, which indicated that the reliability was sufficient for statistical analysis. Due to the limitation of space, and the CRI scale is not the main content of this paper, the details are omitted.

It should be noted that the questionnaire was implemented in Chinese mainland, so the original language was simplified Chinese. This paper presents the English translation version. Due to the

different characteristics of Chinese and English, the English version has been modified with proper wording, which is not a complete literal translation.

### *4.2 Prediction of Continuous Reading Intention (CRI)*

In order to find out which dimensions of PTSOLR have a significant effect on students' continuous reading intention, a stepwise regression analysis was conducted on the basis of correlation analysis.

#### *4.2.1 Correlation Analysis*

In order to analyze the correlation between the factors of PTSOLR and CRI, Pearson correlation analysis was employed. The results (see Table 2) show that the four factors of PTSOLR are significantly correlated with CRI ($p$<0.001), indicating that the five factors could be put into the regression equation together**.**

Table 2. *the Correlations Between Factors of PTSOLR and CRI*

| | ES | MS | AS | IS |
|---|---|---|---|---|
| CRI | 0.38*** | 0.28*** | 0.45*** | 0.24*** |

*ES* emotional support, *MS* methodological support, *AS* autonomous support, *IS* instrumental support, *CRI* continuous reading intention
*** $p < 0.001$

#### *4.2.2 Regression Analysis*

Taking four factors of PTSOLR as independent variables and CRI as dependent variable, a stepwise regression analysis was conducted. As a result shown in Table 3, autonomous support (β=0.34, $p$<0.001) and emotional support (β=0.19, $p$<0.01) significantly positively predicts continuous reading intention ($R^2$=0.23). This indicates that for teachers, giving students autonomy and emotional care is the most direct and effective way to improve their continuous reading intention.

Table 3. *Stepwise Regression Model of Predicting Students' CRI for PTSOLR (N = 257)*

| Dependent variable | Predictors | B | S.E. | β | T | $R^2$ |
|---|---|---|---|---|---|---|
| CRI | ES | 0.19 | 0.06 | 0.19 | 2.97** | 0.23 |
| | AS | 0.39 | 0.07 | 0.34 | 5.25*** | |
| | Constant | 2.39 | 0.39 | | 6.20*** | |

*CRI* continuous reading intention, *ES* emotional support, *AS* autonomous support
** $p < 0.01$, *** $p < 0.001$

## 5. Discussion and Conclusion

This study developed a scale to measure perceived teacher support in online literature reading (PTSOLR), and identified the relationship between PTSOLR and students' continuous reading intention (CRI) through regression analysis. Using exploratory factor analysis, the four factors of PTSOLR were clarified. The results of reliability analysis suggest the scale is reliable enough to be put into use. The PTSOLR scale provides an opportunity for teachers to ascertain students' actual perception of their teaching support in online literature reading, and allows teachers to optimize their teaching support in response to students' needs. Students feel a meaningful connection with a teacher

that offers help in times of need and become more motivated towards learning from that particular teacher (Pap et al., 2021). Therefore, this work has practical teaching significance.

Regression analysis shows that teachers' autonomous support and emotional support can significantly predict students' CRI, which is consistent with previous research results (Bieg et al., 2013; De Naeghel et al., 2014). According to self-determination theory, satisfying students' needs for autonomy and relatedness can stimulate their intrinsic learning motivation, thus improving their learning intention. Teachers should provide enough autonomous space and emotional care to students in order to improve their continuous reading intention.

This study has some limitations. Firstly, the participants in this study are postgraduates from Chinese mainland. Future research could investigate different countries and regions to generalize the results. Secondly, the relationship between PTSOLR and CRI was clarified by quantitative method, but the underlying reasons are still unclear. In the future, teachers and students can be interviewed to supplement qualitative data.

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