Digital Flow: Insights from English Teacher Educators

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Article info	Abstract
	Since Csikszentmihalyi's seminal work in 1975, the concept of flow has been extensively explored within the field of psychology. However, its application within foreign language teaching, particularly in the realm of digital language instruction, remains relatively under-researched. To address this gap, this study examined the flow experience of 58 teacher educators tasked with teaching English reading skills in a virtual environment (Learning Management System - LMS) during the Covid-19 pandemic. This study employed a comprehensive flow model encompassing antecedents, experience, and consequences to: 1) examine the relationships between flow antecedents, flow experience, and flow consequences; and 2) investigate potential differences among teacher educators based on gender, academic degree, and teaching experience. Quantitative data analysis including correlation, One-way ANOVA, Independent-samples t-test, complemented by face-to-face interviews, uncovered noteworthy insights: Firstly, moderate to low correlations were found between the three stages of flow experienced by teacher educators in the computer-mediated environment. Secondly, male teacher educators displayed a moderately higher level of flow antecedents and flow experience compared to their female counterparts within the virtual setting. Nevertheless, the educators' academic degree and teaching experience exhibited a significant impact on the consequences of flow. These findings highlight the importance of improving teacher educators' technological proficiency within training programs by incorporating specific flow stimuli, such as clear tasks, appropriate task difficulty, relevant content, and the development of technology skills. *Keywords*: flow, reading skill course, teacher educators, virtual environment

1. Introduction

Although the concept of flow may appear novel in scientific discourse, its experience is far from new. This autotelic experience likely provides the sole explanation for why certain individuals willingly engage in activities, often demanding and perilous, with a profound sense of intrinsic fulfillment. Flow denotes a condition wherein a person becomes wholly absorbed in an activity, oblivious to fatigue, the passage of time, or any external distractions (Csikszentmihalyi et al., 2005). This deeply gratifying experience compels individuals to seek its recurrence, yearning to relive the sensation time and again (Csikszentmihalyi & Csikszentmihalyi, 1988).

Flow is a psychological state of deep engagement in an activity where an individual's skill level aligns with the task's challenge. According to Csikszentmihalyi (1990), flow creates a state of complete absorption and enjoyment, which enhances workplace productivity and fosters long-term motivation and professional growth (Csikszentmihalyi & Csikszentmihalyi, 1988; Nakamura & Csikszentmihalyi, 2002). Flow occurs when the difficulty of a task matches or slightly exceeds an individual's skill level, creating an optimal experience (Shin, 2006). If the challenge is too high, it leads to frustration, and if too low, it causes boredom. As individuals take on new challenges, their skills improve, pushing them to pursue more complex tasks (Shernoff et al., 2003). Flow can be understood in three stages: *flow antecedents* (conditions that foster flow), *flow experience* (characterized by enjoyment and focus), and *flow consequences* (such as positive attitudes and enhanced learning) (Rossin et al., 2009).

While flow was initially explored in art subjects such as painting and sculpturing and later in language learning from students' perspectives (Czimmermann & Piniel, 2016; Egbert, 2004; Ibrahim & Al-Hoorie, 2018; Li et al., 2019; Liu & Song, 2021), there has been a scarcity of studies examining flow in language teaching (Bakker, 2005; Basom & Frase, 2004; Frase, 1998; Montoro & Gil, 2019; Rodríguez-Sánchez et al., 2011; Tardy & Snyder, 2004). As Csikszentmihalyi (1996) points out, it is important to investigate teachers' flow experience since the motivation stemming from teachers' flow can be very effective in teaching. As online education becomes more prevalent, especially in language teaching, exploring how EFL teacher educators experience flow can help identify strategies to maintain motivation, reduce burnout, and create a more dynamic and interactive learning atmosphere for students (Csikszentmihalyi, 1990).

Existing research on the flow experience presents a compelling opportunity for further exploration in various aspects of language teaching. Firstly, prior to the pandemic, virtual learning was merely an option; however, with the outbreak of Covid-19, it became the sole resource for both students and teachers. They were compelled to transition to online courses, thereby

eradicating the physical distance between teachers and students. Teachers, more specifically, found it essential to use technology in teaching (Mohammad-Salehi & Vaez-Dalili, 2022). Secondly, most research has solely paid attention to the second stage of flow, namely the *flow experience*, among language learners in traditional classroom settings (Czimmermann & Piniel, 2016; Egbert, 2003). Consequently, very few studies have investigated English teachers' *flow experience* in online teaching environments. These efforts have spurred the current research; however, this limited scope hinders the generalizability of flow research.

The present study employed a mixed-method approach, sampling English language teachers from a Teacher Education University, with a focus on flow in online language teaching. The research framework draws inspiration mainly from Liu and Song's (2021) study. Accordingly, our research framework is based on Liu and Song's (2021) three-stage flow model.

In light of existing gaps in the literature, we recognize the importance of investigating flow experience to enhance our understanding of language teaching from teacher educators' perspectives. Furthermore, this study offers educators an invaluable opportunity for self-reflection on what constitutes successful teaching moments. Thus, the present study endeavors to probe the digital flow at the tertiary level, with a focus on addressing the following questions:

1. What was the digital flow of teacher educators during the online reading skills courses?

2. What differences exist in their flow concerning gender, academic degree, and teaching experience?

2. Literature Review

2.1. Flow in Education

Flow theory refers to a state of deep immersion in a task, which has been explored in various fields, including education. Sobhanmanesh (2022) explored how EFL teachers experience flow, identifying that emotional intelligence and personality traits significantly predicted flow states in teaching. Similarly, Shim et al. (2023) linked flow to psychological need for satisfaction among teachers, finding that competence was the most crucial factor in fostering flow during teaching, while autonomy influenced teachers' intentions to leave their jobs. Dai and Wang (2023) further expanded on the interplay between proactive personality and flow in Chinese EFL teachers, demonstrating that flow had a stronger predictive power for work engagement

than personality traits. In the context of positive psychology, Dewaele et al. (2019) highlighted the importance of emotions in language learning, emphasizing that interventions designed to enhance flow and other positive emotions could significantly contribute to both teachers' and students' educational experiences. Moreover, shifting to online teaching during the pandemic posed new challenges to achieving flow, as evidenced by Dewaele et al. (2022), who observed a reduction in flow experience among Kurdish and Arab EFL students in an online environment compared to in-person classes. This suggests that teacher-student interaction quality is a key determinant of flow, particularly in virtual environments. Lastly, Wang et al. (2020) examined how video lecture design affects learners' flow experience, noting that interactive questioning strategies and varied presentation styles positively influence engagement in Chinese language learners. Together, these studies emphasize the intricate interplay of psychological, emotional, and contextual factors in fostering flow in language education.

Overall, these studies collectively emphasize the importance of emotional, psychological, and contextual factors in achieving flow in language teaching and learning. However, many rely on self-reported measures or cross-sectional designs, suggesting the need for more robust research to better understand how flow evolves over time and across various learning environments such as teacher training programs. Additionally, more work is needed to explore the interaction of technological advancements with flow, especially in the wake of widespread remote learning.
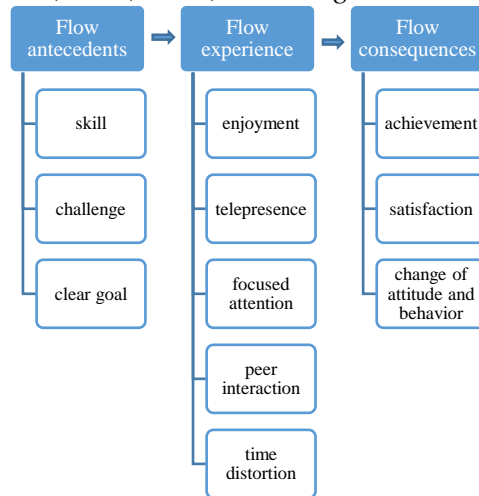
2.2. Research Framework

The three stages of *flow* are sequenced in our theoretical framework. We included three variables in *flow antecedents* namely *skill* (e.g. I have sufficient Internet skills needed for the online reading course), *challenge* (e.g. This course is too demanding for me), and *clear goal* (The requirement of the course is clearly defined). Five constructs were in *flow experience*: *enjoyment* (e.g. I am attracted to the topics and content of this course.), *telepresence* (e.g. I remember vividly the way in which the contents were presented on the screen), *focused attention* (e.g. During online class, I have a feeling of concentration), *peer interaction* (Liu & Song, 2021) (e.g. Generally, I exchange ideas with the head of the department about my teaching) and *time distortion* (e.g. When teaching reading, I'm unaware of what is going on around me). We included these five variables in the model as they are believed to be highly contributing to the *flow* (Joo et al., 2012; Konradt et al., 2003; Ro et al., 2018). *Flow consequence* includes *achievement*, defined as how much a teacher has gained from teaching (Shin, 2006), *satisfaction*, defined as the level of positive feeling a teacher experiences while teaching (Shin, 2006), *change of attitude and behavior* (Skadberg & Kimmel, 2004) (e.g. I will return to this

course to gain more skills about how to teach reading). Figure 1 illustrates our adapted model.

Figure 1

Research Framework for Teacher Educators' Flow Experience (Adapted From Liu & Song, 2021; Shin, 2006; Skadberg & Kimmel, 2004)

Flow antecedents	→	Flow experience	→	Flow consequences
skill		enjoyment		achievement
challenge		telepresence		satisfaction
clear goal		focused attention		change of attitude and behavior
		peer interaction		
		time distortion		

3. Method

3.1. Participants

To facilitate data collection, we employed a convenient sampling method (Dornyei, 2007) to select 58 Iranian teacher educators whose mother tongue was Persian. They were tasked with instructing online reading skills across various branches of Teacher Education University nationwide. While the gender distribution among educators showed minimal variance (58% female and 42% male), there was notable diversity in age representation: 27% of educators were aged 50 or older, with this course marking their first foray into teaching reading skills; 42% fell within the age bracket of 35 to 49, and 28% were under the age of 35. Participants were further classified based on their academic degree (7 BA, 19 MA, and 32 PhD) as well as their teaching experience into four categories (0-5, 6-10, 11-20, and above 21 years), encompassing a range from novice instructors (with fewer than five years) to seasoned educators (with over 20 years).

In order to triangulate the quantitative data, we conducted interviews to find the underlying factors influencing educators' *flow experience* in online classes. The interviewees were chosen based on their provision of contact information. A total of 33 participants were interviewed.

All participants were briefed on the fundamental procedures, research objectives, and potential implications. Furthermore, these teacher educators

sent the same notification to other teachers through a WhatsApp group dedicated to educators. They were also assured of their right to leave the study anytime.

3.2. Materials and Instruments

We used two instruments in this study: a questionnaire adapted from Liu and Song (2021), Shin (2006), Skadberg and Kimmel (2004), and the follow-up interviews.

3.2.1. Questionnaire

The *flow experience* of teacher educators was evaluated using a recently developed instrument originally designed to assess students' flow experiences. To adapt this instrument for teacher educators, we made thoughtful adjustments to the content of the items while preserving their original structure (see Appendix B). For example, items that initially focused on student learning were carefully revised to target the specific context of teaching reading skills courses. One illustrative adaptation is the item: "Generally, I exchange ideas with my colleagues about teaching reading skills courses." This revision not only aligns the instrument with the educators' responsibilities but also enhances its relevance to their professional practice. Recognizing that flow theory was originally developed in psychology, we sought to ensure the adapted version was appropriately tailored for the educational context. To validate the modifications, the revised instrument was reviewed by two experienced teacher educators, whose expertise provided critical insights into the instrument's applicability and effectiveness. The questionnaire comprised 40 items that measure *flow antecedents* (11 items), *flow experience* (20 items), and *flow consequences* (9 items). The participants were instructed to rate the relevance of each item to their experiences during the preceding week using a scale ranging from 5 (totally suitable for me) to 1 (totally unsuitable for me). Previous research involving diverse participants from various organizations and occupations has demonstrated the empirical distinctiveness and good reliability of these items (see Table 1).

Table 1

Constructs and Reliability

Construct	α	Items
Flow antecedents		
Clear goal	.92	1-4
Skill	.88	5,6,21
Challenge	.86	7-10
Flow experience		
Enjoyment	.89	11-14,20
Telepresence	.89	15-19
Focused attention	.35	22,23,27
Time distortion	.57	29,30,32
Peer interaction	.79	24-26, 28
Flow consequences		
Satisfaction	.84	31,34,35
Achievement	.70	33,36,40*
Change of attitude and behavior	.87	37-39

3.2.2. Interview

The semi-structured interview was carefully designed to probe different flow dimensions by building directly on established flow theory. The interview questions were developed by adapting items from the flow questionnaire, ensuring a direct alignment with the three stages of flow. Each interview question corresponded to a specific component within these stages (See Appendix A). This allowed us to maintain consistency between the quantitative (questionnaire) and qualitative (interview) phases of the study. The face-to-face interviews provided an opportunity for educators to elaborate on their experiences in a more personalized and detailed manner, offering richer insight into their emotional and cognitive states during the teaching process.

3.3. Procedure

There were two phases in the data collection: initially, a questionnaire survey was administered to assess educators' three-stage *flow experience*, followed by subsequent interviews. The data were collected between April 2023 and July 2023.

The educators received the questionnaires online and were allotted 30 minutes to complete them. A total of 58 teacher educators successfully filled out the questionnaire, contributing to a valid dataset.

Following the submission of the online questionnaire, face-to-face interviews were designed to explore the teaching experiences of 30 teacher educators. Each interview lasted 30 minutes and was conducted at Teacher Education University, adhering closely to health protocols due to the ongoing pandemic. These interviews also delved into educators' perceptions of the

components within each stage of flow. Notably, the interviewers were the researchers involved in the present study. At the outset of each interview, educators were reassured about the confidentiality of their responses.

3.4. Data Analysis

SPSS 22.0 was utilized for data analysis. Descriptive analysis was used to examine the three main flow stages and their dimensions. It was also necessary to independently assess different flow sub-constructs as well as their interplays to gain a better view of *flow experience* in the courses of teaching online reading skills (Czimmermann & Piniel, 2016; Liu & Song, 2021; Shin, 2006). Consequently, Pearson correlation technique was employed to specify significant aspects under *flow consequences* and *flow experience*.

One-way ANOVA and Independent-samples t-test were employed to answer the second research question. Additionally, qualitative content analysis was employed to analyze the interview data. This involved transcribing the interview data, independently reviewing the transcriptions to extract each participant's *flow experience* features. Subsequently, our findings were compared and discussed to highlight discrepancies in *flow experience* among educators based on gender, academic degree, and teaching experience. Our findings and transcriptions were presented to the interviewees in an online forum, and consensus was reached on the excerpts.

4. Results and Discussion

4.1. Results

4.1.1. RQ1: An Overview of Three Stages of Flow

Overall, the teacher educators demonstrated a moderate to low level of flow across *flow antecedents* (M= 3.80 SD = 0.64), *flow experience* (M= 0.60, SD = 1.20), and *flow consequences* (M= 2.10, SD= 0.81). Previous research suggests that a score above 3 indicates experiencing flow (Czimmermann & Piniel; 2016; Rossin et al., 2009).

As Table 2 illustrates, the teacher educators failed to set clear goals for teaching the online reading course in *flow antecedents* (M= 1.50, SD =0.43) and also lacked proficiency in addressing challenges related to online teaching (M= 1.20, SD= 0.27). However, they encountered moderate levels of challenge in managing the online reading course (M= 3.43, SD= 0.45).

During *flow experience*, peer interaction received the lowest score (M= 0.91, SD= 0.27), followed by time distortion (M= 0.94, SD= 0.26) and enjoyment (M=1.10, SD= 0.30). Table 3 provides a clearer illustration of how teacher educators' enjoyment (r = 0.808**, p < .01), telepresence (r = 0.865**, p < .01), focused attention (r = 0.766**, p < .01), time distortion (r = 0.693**, p < .01), and peer interaction (r = 0.567**, p < .01) collectively contribute to

the reduced *flow experience*. Teacher educators demonstrated less eagerness to discuss their teaching activities with colleagues, likely due to the demanding nature of online teaching during the pandemic and time constraints.

Table 2

Descriptive Analysis of the Flow Stages

	Min	Max	M	SD
Flow antecedent	2.1	5.3	3.80	0.64
Clear goal	1.00	5.00	1.50	0.43
Skill	1.00	5.00	1.20	0.27
Challenge	1.00	5.00	3.43	0.45
Flow experience	1.00	5.00	0.60	1.20
Enjoyment	1.00	5.00	1.10	0.30
Telepresence	1.00	5.00	1.90	0.50
Focused Attention	1.00	5.00	1.50	0.26
Time distortion	1.00	5.00	0.94	0.26
Peer interaction	1.00	5.00	0.91	0.27
Flow consequences	1.00	5.00	2.10	0.81
Satisfaction	1.00	5.00	1.02	0.27
Achievement	1.00	5.00	1.03	0.27
Change of attitude and behavior	1.00	5.00	1.70	0.35

Table 3

Correlation of Flow Experience and its Dimensions

	Enjoyment	Telepresence	Focused Attention	Time distortion	Peer interaction
Flow experience	0.808**	0.865**	0.766**	0.693**	0.567**

Table 4

Correlation Analysis of Flow Experience and Flow Consequences

	Enjoyment	Telepresence	Focused Attention	Time distortion	Peer interaction	*Flow experience*
Flow consequences	-.744**	-.708**	-.669**	-.536**	-.482**	-.837**
Satisfaction	-.648**	-.610**	-.539**	-.529**	-.359**	-.728**
Achievement	-.728**	-.671**	-.671**	-.446**	-.415**	-.780**
Change of attitude and behavior	-.640**	-.632**	-.598**	-.475**	-.506**	-.752**

Upon completing the online reading course, teacher educators provided feedback regarding *flow consequences*, including satisfaction (M=1.02, SD=0.27), achievement (M=1.03, SD=0.27), and changes in attitudes and behaviors (M=1.70, SD=0.35). Table 4 reveals a negative but significant interaction between *flow consequences* and *flow experience* (r=0.837**,

p<.01). Consequently, the negative flow results in this online teaching are tenable.

4.1.2. RQ2: Differences of Flow among Teacher Educators With Respect to Their Gender, Academic Degrees, and Teaching Experience

We further evaluated the flow of teacher educators considering their university degree, gender, and past teaching experience. One-way ANOVA and an independent-samples t-test were used to find the disparities in flow and its associated factors.

4.1.2.1. Differences Among Educators With Respect to Their Gender (Statistical Data). Table 5 shows the comparison between female teacher educators and their male counterparts concerning the three flow stages. A significant difference is evident between female and male teacher educators in terms of *flow antecedents* (t(56)= 2.65, p < .01), showing a large effect size (r = 0.44, d = 0.71), as well as in *flow experience* (t(56) = 2.56, p < .01, r = 0.32, d = 0.75). However, no significant difference is observed in *flow consequences* (t(56) = 1.89, p > .01, r = 0.03, d = 0.37). Further examination reveals meaningful differences in their perceptions of clear goals (t(56) = 2.40, p < .01) and telepresence (t(56) = 2.39, p < .01), with large effect sizes (r $_{clear\ goals}$ = 0.56; d $_{clear\ goals}$ = 1.48 and r $_{telepresence}$ = 0.96; d $_{telepresence}$ = 1.69), as well as in focused attention (t(56) = 3.34, p < .01) and change of attitude and behavior (t(56) = 1.98, p < .01), with medium-to-low effect sizes (r $_{focused\ attention}$ = 0.23, d $_{focused\ attention}$ = 0.43; r $_{change\ of\ attitude\ and\ behavior}$ = 0.28, d $_{change\ of\ attitude\ and\ behavior}$ = 0.50).

4.1.2.2. Differences Among Educators With Respect to Their Gender *(Interview Data).* In alignment with the results in the previous section, the interviews revealed several differences between female and male teacher educators concerning their perceptions of the flow, notably in *flow antecedents* and *flow experience*. The insights gleaned from the interviews with teacher educators corroborated the observed differences across the three stages overall.

Table 5

T-test of Flow between the Female and Male Educators

Flow dimensions	Female		Male						
	M	SD	M	SD	t	df	p	Cohen's d	r
Flow antecedent	3.87	0.57	3.44	0.65	2.65	56	0.000	0.71	0.44
Clear goal	3.70	0.37	4.44	0.64	2.40	56	0.000	1.48	0. 56
Skill	3.50	0.43	4.20	0.54	1.88	56	0.402	0.17	0.08
Challenge	2.60	0.34	3.67	0.73	2.67	56	0.790	0.19	0.12
Flow experience	4.30	0.56	4.34	0.54	2.56	56	0.000	0.75	0.32
Enjoyment	4.32	0.43	2.70	0.62	1.29	56	0.213	0.24	0.04
Telepresence	2.50	0.44	3.35	0.58	2.39	56	0.004	1.69	0.96
Focused attention	3.10	0.65	4.33	0.63	3.34	56	0.007	0.43	0.23
Peer interaction	3.44	0.35	3.55	0.38	2.80	56	0.334	0.18	0.07
Time distortion	2.59	0.46	4.31	0.63	1.27	56	0.209	0.25	0.18
Flow consequences	3.20	0.75	3.89	0.85	1.89	56	0.264	0.37	0.03
Achievement	2.58	0.66	4.45	0.67	1.22	56	0.224	0.26	0.15
Satisfaction	4.62	0.57	3.68	0.74	1.78	56	0.87	0.26	0.01
Change of attitude and behavior	4.10	0.66	4.55	0.63	1.98	56	0.001	0.50	0.28

I knew what I expected from my class; the only thing I needed to do was not to deviate from my course goals; that is why I tried to be prepared before class; it was difficult since it was online and any disconnection was a disturbance to my class life, but I coped with it and it gave me a sense of comfort. (Teacher 2, Male)

It was difficult to set clear goals. Indeed, I set goals at the beginning, but after a while I stopped following them. They faded away in my classes probably because online classes are more dynamic than in person classes. Constantly I had to change the time of class; there were internet connection problems; LMS was not a good platform; the students were more difficult to manage; you did not know what your students were doing as long as their cameras were off. These elements adversely affect the entire process of teaching … I was nervous a little bit. (Teacher 9, Female)

These interviews indicate that they had varying levels of *flow antecedents*. The male teacher educator found it 'comforting' to have clear objectives for online classes, whereas the female teacher educator perceived the task as 'difficult' due to technical problems or a lack of certainty in online classes.

The noticeable difference between the two excerpts can be attributed to the male teacher's meticulous attention to detail, which demonstrates his proactive engagement with the ongoing task. On the other hand, the female participants seem to be hindered by preconceived notions about online classes

and a lack of preparedness, especially regarding connectivity issues. As a result, inadequacies in navigating educational technologies, including both hardware and software, likely contributed to the imbalance between the skill levels and challenge.

The interviews also delved into the contrasting perspectives of female and male teacher educators regarding their perceptions of telepresence and focused attention. Teacher 6 and teacher 7 specifically discussed their views on the overall process of teaching reading tasks.

> *I think it was only the reading skills that attracted me in online classes. I still remember how I taught skimming and scanning online. Since it was online, students had an easy access to other online resources to support their answer quickly. What really impressed me was that students were able to find the meaning of vocabularies so fast compared to in person classes. Further, we were able to focus on one specific part of reading, which was displayed on the monitor. This caused us not to be distracted by other parts. (Teacher 30, Male)*

> *At first everything looked fine as long as I was the only person talking, but as soon as other students started participating in the class activity, I got enmeshed in a confusion of voices; not only their own voices but also noise of their surroundings. I was not able to see their faces (50 students in one online class); all cameras were off as students had to turn off their cameras due to poor connection. The only thing I wished was to finish the class soon. That was a big headache. (Teacher 7, Female)*

The disparities in telepresence among teacher educators were further substantiated by their responses to online classes. Telepresence, in this context, pertains to a distinct impression of the reading activities conducted in an online class. For instance, teacher 30 focused on the overall reading skills and described their approach to the activity, whereas teacher 7 felt perplexed by the influx of voices and noises.

A further aspect of *flow experience* was concentration or focused attention. One of the factors influencing this difference in *flow experience* was technology skills. Teacher educator 30 was able to enhance concentration by focusing on a specific aspect of reading, whereas teacher educator 7 struggled with the disturbance caused by multiple voices and consequently lost control of the class.

In terms of the perception of *flow consequences* there were no significant differences between male and female teacher educators. However, they expressed contrasting ideas about their attitudes towards online classes.

It was a new challenging experience, thanks to Covid (kidding here). I began to adapt to this new teaching environment and started to learn new items. I think I won't encounter any problems teaching reading skills courses online again. (Teacher 16, Male)

Although I was at home enjoying my privacy and convenience on my own chair, I don't like to see those days again. For anything I did online I needed to contact an IT man. To be honest, I was not familiar with the alphabets of online classes and had to learn them while teaching online. (Teacher 19, Female)

4.1.3. RQ2: Differences among Educators with Respect to Their Academic Degrees (Statistical Data)

Table 6 presents the variation among teacher educators with different degrees. A notable distinction is observed in *flow consequences* (F (2) = 3.55, p = 0.33 > 05) among teacher educators. However, no significant differences were found in *flow antecedents* and *flow experience* (F $_{flow\ antecedents}$ (2) = 2.71, p= 0.01 < .05; F $_{flow\ experience}$ (2) = 1.31, p = 0.03 < 05). Further analysis of the differences in components across the three stages revealed a significant difference in their attitude and behavior (F (2) = 2.58, p = 0.54 > 05).

Table 6

One-way ANOVA Test of Flow among the Teacher Educators with BA, MA or PhD

Flow dimensions	One-way ANOVA		
	F	df	p
Flow antecedent	2.71	2	0.01
Clear goal	2.64	2	0.07
Skill	2.55	2	0.04
Challenge	1.34	2	0.03
Flow experience	1.31	2	0.03
Enjoyment	1.43	2	0.06
Telepresence	2.57	2	0.01
Focused attention	3.70	2	0.05
Peer interaction	1.69	2	0.04
Time distortion	1.53	2	0.00
Flow consequences	3.55**	2	0.33
Achievement	2.54	2	0.00
Satisfaction	2.76	2	0.01
Change of attitude and behavior	2.58**	2	0.54

4.1.3.1. Differences Among Educators With Respect to Their Academic Degrees (Interview Data). The only discernible differences among the teachers with different degrees were in *flow consequences* and its dimension, namely the change of attitude and behavior.

> *Reflecting on what happened during my online class, I think I did my job well. I had been taught (as a student) and had been teaching (as a teacher) in person classes for many years. This new experience was pretty tough and demanding, though I gained what I expected. Anyway, I do not like to get back to online classes. (Teacher 13, PhD)*

> *I think I need to gain more experience in online classes teaching reading tasks. I believe the future of teaching environment will change and teachers should learn how to teach online, no matter what language skills. (Teacher 12, MA)*

The interviews conducted with two teacher educators highlighted notable differences in their *flow antecedents* and attitudes towards teaching the reading skills online, particularly based on their educational degrees. The PhD holder acknowledged the benefits gained from the course but expressed a lack of interest in continuing such classes in the future, yearning for a return to the traditional teaching methods of the past. In contrast, the MA holder, although partially satisfied with his teaching and meeting the course objectives, strongly believed that virtual teaching would dominate the future of education. He insisted that the instructors master online teaching skills to adapt and thrive, despite initially finding it daunting.

4.1.4. RQ2: Differences Among Educators With Respect to Their Teaching Experiences (Statistical Data)

Table 7 presents the variations between novice instructors (with fewer than five years of teaching experience) and seasoned educators (with over 20 years of teaching expertise). Surprisingly, the only significant difference was found in *flow consequences* ($F_{flow\ consequences}$ (3) = 3.71, p = 0.13 > 05), but not in *flow antecedents and flow experience,* ($F_{flow\ antecedents}$ (3) = 1.29, p= 0.01 < .05; $F_{flow\ experience}$ (3) = 0.63, p= 0.03 < .05). Further examination of the variations in dimensions across the three stages among teacher educators revealed a notable difference in their satisfaction level (F (3) = 2.92, p = 0.63 > 05).

Table 7

One-way ANOVA Test of Flow Among the Teacher Educators With Their Teaching Experiences

Flow dimensions	One-way ANOVA		
	F	*df*	*p*
Flow antecedent	1.29	3	0.01
Clear goal	2.66	3	0.04
Skill	1.87	3	0.02
Challenge	2.34	3	0.01
Flow experience	0.63	3	0.03
Enjoyment	1.68	3	0.04
Telepresence	2.77	3	0.00
Focused attention	2.87	3	0.03
Peer interaction	1.63	3	0.02
Time distortion	3.56	3	0.04
Flow consequences	3.71**	3	0.13
Achievement	2.32	3	0.04
Satisfaction	2.84	3	0.03
Satisfaction	2.92**	3	0.63

4.1.4.1. Differences Among the Educators With Respect to Their Teaching Experiences (Interview Data). What is evident from the following these two excerpts is that the novice teacher educator is more satisfied with her performance in the classroom. She successfully utilized technology in her reading class by incorporating additional passages that aligned with her students' interests and preferences. On the other hand, the experienced teacher educator, despite some level of contentment, feels inadequate when it comes to integrating new technology into his online classes. He is actively seeking more opportunities to enhance his knowledge and skills in virtual teaching.

> *One of the main advantages of online classes was that I had a quick and easy access to upload some more interesting passages and consequently increased students' participation as I started knowing their favorites based on which I selected some passages. This made my job a lot easier. (Teacher 10, 5 years' experience)*

> *After I completed the course online, though I felt happy because of experiencing this situation, I sense I need to be more updated about technology and how to teach reading tasks online. This unexpected switch from traditional classroom to virtual classes taught me being experienced is not enough, and we should gain more experience about using technology in classes. (Teacher 4, 25 years' experience)*

4.2. Discussion
4.2.1. General Discussion of Educators' Flow

Overall, the descriptive analysis indicates that a moderately high level of *flow antecedents* leads to a low *flow experience*, which then translates into a low-medium level of *flow consequences*. These findings partially align with previous studies that have explored flow experience among teacher educators in both online and traditional classroom settings (Cho, 2018; Joo et al., 2012). These studies have consistently highlighted the varying levels of *flow consequences* and *flow experience* across various areas. Specifically, for *flow experience,* the mean score was the lowest across of the three stages, possibly due to the relatively lower scores of dimensions such as peer interaction and time distortion. This outcome can be attributed to the intense and short nature of online teaching activities, which restricts opportunities for teacher educators to engage in peer interaction and creates a diminished sense of the passage of time. While Li et al. (2019) found inconsistent findings reporting higher *flow experience* scores compared to *flow consequences* in the context of online vocabulary learning, others like Rossin et al. (2009) have found the opposite results, with *flow consequences* scoring greater than *flow experience*. *Flow consequences* in the present research scored in the low-medium range, which can be justified by the relatively low magnitude of dimension such as 'achievement' and 'satisfaction'. During interviews, the teacher educators mentioned the challenging atmosphere of LMS and unreliable internet connections as major obstacles.

Teacher educators exhibited a greater degree of *flow antecedents*, indicating their ability to understand the requirements of the teaching process. However, the high balance between their challenges and skills presented in these activities is not conducive to stimulating a flow experience (Killi, 2005; Tardy & Snyder, 2004). Consequently, despite their engagement in online teaching, the teacher educators achieve lower *flow experience* levels, resulting in relatively low-medium scores for *flow consequences*. This trend persists throughout the entire teaching process. From a statistical standpoint, the negative yet significant relationship between *flow consequences* and *flow experience* suggests that the teacher educators were unable to experience positive emotions while engaging in online teaching tasks, particularly those related to reading.

4.2.2. Educators' Experiences of Each Dimension of Flow

At the stage of *flow antecedents*, the teacher educators were provided with well-defined reading tasks that were aligned with the national syllabus at the Teacher Education University. These tasks were accompanied by detailed instructions, ensuring that the educators understood the requirements.

However, it is important to note that the syllabus was originally designed for traditional, in-person classes, which explains the lower scores in having clear goals. This mismatch between the syllabus and the virtual teaching environment might have had an adverse impact on the teacher educators' teaching skills, consequently resulting in a lower level of skill perceived by them. Since the teacher educators had to adapt to the new realm of virtual teaching and acquire the necessary skills, which are not necessarily related to language abilities, they were faced with significant teaching challenges.

Upon examining *flow experience*, we discovered low mean scores in dimensions. It is worth noting that concentration, enjoyment and telepresence are significant sub-constructs in flow studies (Joo et al., 2012; Ro et al., 2018); in the present study, these variables demonstrated a strong correlation with *flow experience* ($r_{enjoyment} = 0.808^{**}$, $r_{focused\text{-}attention} = 0.865^{**}$, $r_{telepresence} = 0.766^{**}$, $p < .01$). In the virtual context telepresence has the ability to evoke a sense of enjoyment and capture individuals' attention towards the activities they are engaged in. These factors play a crucial role in facilitating *flow experience*.

In the context of reading tasks, it is common to incorporate additional reading passages that align with the students' interests. This practice becomes even more prominent in online classes, where the pace of teaching tends to be faster. As a result, greater concentration is required to ensure the integrity and coherence of the activity. The close correlation between *flow experience* and focused attention, enjoyment, and telepresence has been highlighted in previous research (Skadberg & Kimmel, 2004). By incorporating reading passages that cater to students' interests and maintaining a fast-paced teaching environment, the learning experience becomes more engaging and immersive. This, in turn, enhances the enjoyment, focused attention, and telepresence of the participants, ultimately leading to a heightened *flow experience*.

4.2.3. Differences Among Educators Considering Their Gender, Degrees, and Teaching Experience

Significant differences were observed between male and female participants concerning *flow antecedents* and *flow experience*, but not in *flow consequences*. The variation in *flow antecedents* and *flow experience* can be statistically explained by the differences in teacher educators' levels of clear goals, telepresence, and focused attention. Previous studies, such as Rodríguez-Ardura and Meseguer-Artola (2021), have shown that the role of gender in determining teachers' flow in e-learning environments is moderate. This research, like theirs, demonstrates that gender does not equally influence all three aspects of teachers' flow. Furthermore, the findings by Shim et al. (2022) confirm that gender plays a significant role in shaping *flow experience* of both female and male teachers. *Flow consequences* varied among teacher

educators with different degrees. However, there were no meaningful differences in either *flow consequences* or *flow antecedents*. The variation in *flow consequences* can be attributed to the differences in teacher educators' attitudes and behaviors. Additionally, teaching experiences revealed differences in *flow consequences*, which can be justified by the varying levels of teacher educators' satisfaction. In summary, the lack of significant differences in *flow antecedents* and *flow experience* among teacher educators aligns with previous studies that the level of *flow experience* is not related to past academic or life experience (Joo et al., 2012; Ro et al., 2018).

4.2.4. Differences in the Flow Dimensions Among Educators Considering their Gender, Degrees, and Teaching Experience

Notable differences were observed between female and male teacher educators in terms of clear goals. These differences may be attributed to the level of autonomy they experience while doing tasks. The literature has approved that male teachers in language teaching tend to be more strategically performance oriented (Rubie-Davies et al., 2012) and autonomous (Fadaee et al., 2021) in their teaching, enabling them to adapt their teaching pace and set individualized goals (Pintrich, 2000). A male teacher educator (Teacher 2) demonstrated the ability to accurately assess task difficulty, find appropriate solutions, and utilize effective teaching strategies to address challenges. On the other hand, a female teacher educator (Teacher 9) became nervous and lost control of class, despite having a clear view of the course goals. Consequently, her teaching performance exhibited less autonomy, resulting in a weaker sense of *flow antecedents*. Significant differences were found in focused attention and telepresence in terms of *flow experience* between female and male teacher educators. These differences may be attributed to variations in their task focus and goal setting. As mentioned earlier, their differing perceptions of task difficulty and goals may influence their impressions of teaching reading tasks. Female teacher educators may prioritize task completion and pay less attention to quality issues, as indicated in the interview where one mentioned the sole purpose was "to finish the class." On the other hand, male teacher educators may be more inclined to emphasize high-quality task completion by dividing the reading task into smaller, more manageable sections. Despite facing the same challenges in the virtual environment, male teacher educators demonstrated greater competency in handling the situation by employing the strategy of working on smaller sections of reading texts, allowing for improved concentration and impression. This resulted in the observed variations in telepresence and focused attention.

No meaningful differences were observed between male and female teacher educators in *flow consequence*. One reason for this could be the sudden and unexpected transition from in-person to virtual classes during the

pandemic. The teacher educators were not fully prepared and lacked the necessary skills and strategies. They had to learn these skills "on the job" while teaching online. However, male teacher educators seemed to handle this new demanding situation better than their female counterparts, leading to differences in attitudinal changes towards the activity.

Significant differences were observed among teacher educators with different academic degrees regarding flow consequences and its components, particularly in relation to changes in attitude and behavior. Interviews conducted with a Master's degree teacher educator (Teacher 12) revealed a forward-thinking perspective, as he expressed a strong belief that teaching will predominantly shift to virtual environments in the future. He emphasized the importance of equipping teachers with essential skills to navigate this evolving landscape, reflecting a proactive attitude toward technology integration in education (Ertmer & Ottenbreit-Leftwich, 2013; Kessler, 2018). Conversely, a PhD teacher educator conveyed a more ambivalent stance towards these new technologies, describing the transition to virtual teaching as both challenging and arduous. Despite his acknowledgment of the difficulties, he demonstrated competence in his role, indicating that higher academic qualifications do not necessarily correlate with ease in adapting to new pedagogical frameworks (Kirkwood & Price, 2014). The contrasting attitudes suggest that educators with lower academic degrees may be more inclined to have an optimistic view of technology in teaching, which could facilitate integrating digital tools in their teaching (Howard, 2013).

When examining the years of teaching experience, a notable disparity emerged among the three groups of teacher educators concerning *flow consequences* and overall job satisfaction. While all groups expressed a degree of partial satisfaction with their performance in teaching reading courses, the nuances of their experiences varied significantly. Interestingly, the less experienced educators showed a higher degree of satisfaction compared to their more seasoned colleagues (Brunetti, 2001). This phenomenon may be attributed, at least in part, to their relative youth and the contemporary context in which they are teaching. The less experienced group, often comprising younger educators, demonstrated a greater proficiency with technology, which in turn influenced their perceptions of online teaching (Tondeur et al., 2017). Their familiarity with digital tools and resources fostered a belief that online classes would streamline their instructional efforts and enhance student engagement. Teacher 10 articulated how the accessibility of various online resources provided her with an edge, enabling her to create dynamic and interactive learning environments (Zhao et al., 2002). Conversely, the more experienced teachers, despite their extensive backgrounds in imparting reading comprehension skills, acknowledged a different set of challenges. They recognized the breadth of their experience but were candid about their

struggles with technology integration (Garet et al., 2001). Teacher 4 explicitly mentioned a need for professional development to bolster his technology skills, emphasizing that while he excelled in traditional teaching methodologies, he felt somewhat overwhelmed by the rapid advancements in educational technology (Russell et al., 2003). This divergence in experience and comfort with technology not only shaped their teaching styles but also influenced their overall job satisfaction, highlighting the complex interplay between experience, adaptability, and personal fulfillment in the evolving landscape of education (Davis & Roblyer, 2005).

5. Conclusion and Implications

The present results validate the intricate pattern of three-stage flow observed in teacher educators who engaged in online reading activities. It is evident that individuals with *high flow antecedents* fail to evoke a heightened *flow experience*, resulting in relatively low to moderate levels of *flow consequences*. In general, female and male teacher educators displayed noticeable disparities in *flow antecedents* and *flow experience*, but not in the final stage. More specifically, significant distinctions were found between female and male teacher educators in having clear goals, telepresence, and focused attention. Teacher educators holding different degrees demonstrated differences in *flow consequences*, while no significant disparities were observed in either *flow antecedents* or *flow experience*. The significant variance in the levels of attitude and behavioral changes have made the variance in *flow consequences* statistically significant. Additionally, variations in teaching experiences revealed differences in *flow consequences* for teacher educators, which can be explained by the notable variance in their levels of satisfaction.

It is important to highlight that significant differences were observed in *flow antecedents* and *flow experience* between female and male educators. However, no meaningful differences were reported in most of the underlying sub-constructs of three flow stages among teacher educators with different degrees and teaching experience. This indicates the necessity for an "appropriate activation" (Liu & Song, 2021) in order to stimulate *flow experience* among groups of teachers. Such activation is influenced by factors such as task clarity, task difficulty, the content of reading material, the learners' behavior, technology skills, and the autonomy of teacher educators while teaching reading tasks online. Once their antecedents are appropriately activated, teacher educators will become highly engaged in teaching reading tasks, derive enjoyment from the entire process.

The absence of significant differences in most of the sub-constructs in the three stages further highlights that the factors contributing to the enthusiasm of teacher educators may be attributed to non-academic elements

or performance indicators. These factors could include the virtual environment, the level of interest displayed by learners in the online reading course, and the rapport established between teacher educators and teacher students in the online setting (Ro et al., 2018). The experience of online teaching for educators should be driven by either developing technology-based teacher education program or their personal interest, as they will be highly motivated to teach reading courses virtually.

The present findings have important practical implications for teacher educators in online learning environments. By recognizing the factors that contribute to flow, teacher educators can design more effective online reading activities. Tailoring these factors to meet the needs of educators based on their gender, academic qualifications, and teaching experience can enhance their *flow experience*, resulting in higher satisfaction and engagement. Additionally, institutions can develop technology-based training programs to better equip teacher educators with the skills needed to foster flow in online teaching, ultimately improving both teaching quality and student outcomes.

Although our study contributes to flow research, several limitations concerning the participants, instruments, and variables may have influenced the results and their interpretation. First, concerning the participants, our access was limited to a small group of teacher educators, with only 58 participants due to the pandemic. The restricted sample size and lack of diversity may have adversely affected the generalizability of the findings, meaning that the results should be interpreted with caution when applying them to broader populations of educators. Future research could draw on a larger and more various sample to make sure that the results are representative.

Second, while the questionnaire was adapted from established sources, some items may not have been fully suited to the online teaching context. This could have affected the accuracy of the data, potentially leading to less precise measurements of flow in online teaching. As a result, the implications drawn from this data might be somewhat constrained, and future studies should further refine and validate the questionnaire to better fit online teaching environments. Lastly, although this study focused on measuring educators' flow in online teaching, other important variables, such as linguistic competence, technology knowledge, and motivation levels, were not considered. The absence of these factors could mean that other key influences on flow were overlooked, therefore limiting the comprehensiveness of the findings. They could be measured in future studies to produce a more exhaustive view of the variables that contribute to flow in online teaching.

Acknowledgements

References

Bakker, A. B. (2005). Flow among music teachers and their students: The crossover of peak experiences. *Journal of Vocational Behavior*, *66*(1), 26-44. https://doi.org/10.1016/j.jvb.2003.11.001

Basom, M. R., & Frase, L. (2004). Creating optimal work environments: Exploring teacher flow experiences. *Mentoring & Tutoring*: *Partnership in Learning*, *12*(2), 241-258. https://doi.org/10.1080/1361126042000239965

Brunetti, G. J. (2001). Why do they teach? A study of job satisfaction among long-term high school teachers. *Teacher Education Quarterly, 28*(3), 49-74.

Cho, M. (2018). Task complexity and modality: Exploring learners' experience from the perspective of flow. *The Modern Language Journal*, *10(2)*, 162-180. https://doi.org/10.1111/modl.12460

Csikszentmihalyi, M. & Csikszentmihalyi, I. S. (1988). *Optimal experiences. Psychological studies of flow in consciousness*. Cambridge University Press.

Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. Jossey-Bass.

Csikszentmihalyi, M. (1990). *Flow: the psychology of optimal experience*. Harper and Row.

Csikszentmihalyi, M. (1996). Intrinsic motivation and effective teaching' in J. L. Bess (ed.). *Teaching well and liking it: Motivating faculty to teach effectively.* Baltimore, MD.

Csikszentmihalyi, M., Abuhamdeh, S. and Nakamura, J. (2005). Flow. In A. Elliot (Ed.), *Handbook of competence and motivation* (pp. 598-608). The Guilford Press.

Czimmermann, É. & Piniel, K. (2016). 8 Advanced language learners' experiences of flow in the Hungarian EFL classroom. In P. MacIntyre, T. Gregersen & S. Mercer (Ed.), *Positive psychology in SLA* (pp. 193-214). Multilingual Matters. https://doi.org/10.21832/9781783095360-009

Dai, K., & Wang, Y. (2023). Investigating the interplay of Chinese EFL teachers' proactive personality, flow, and work engagement. *Journal of Multilingual and Multicultural Development*, 1–15. https://doi.org/10.1080/01434632.2023.2174128

Davis, N. E., & Roblyer, M. D. (2005). Preparing teachers for the "schools that technology built": Evaluation of a program to train teachers for virtual schooling. *Journal of Research on Technology in Education, 37*(4), 399-409. https://doi.org/10.1080/15391523.2005.10782445

Dewaele, J.-M., Albakistani, A., & Ahmed, I. K. (2022). Is flow possible in the emergency remote teaching foreign language classroom?

Education Sciences, 12 (7), 444. https://doi.org/10.3390/educsci12070444

Dewaele, J.-M., Chen, X., Padilla, A. M., & Lake, J. (2019). The flowering of positive psychology in foreign language teaching and acquisition research. *Frontiers in Psychology, 10,* 1-13. https://doi.org/10.3389/fpsyg.2023.1088299

Dornyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.

Egbert, J. (2003). A study of flow theory in the foreign language classroom. *The Modern Language Journal*, *87*, 499-518. https://doi.org/10.3138/cmlr.60.5.549

Egbert, J. (2004). A study of flow theory in the foreign language classroom. *Canadian Modern Language Review*, *60*(5), 549-586. https://doi.org/10.3138/cmlr.60.5.549

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2013). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42*(3), 255-284. https://doi.org/10.1080/15391523.2010.10782551

Fadaee, E., Marzban, A., & Najafi Karimi, S. (2021). Teacher autonomy and teaching styles: A gender-comparative study of Iranian EFL academics. *Iranian Journal of English for Academic Purposes*, *10*(3), 1-14. https://dorl.net/dor/20.1001.1.24763187.2021.10.3.1.9

Frase, L. (1998, April). *An examination of teacher flow experiences, efficacy, and instructional leadership in large inner-city school districts*, [paper presentation]. the Annual Meeting of the American Education Research Association, San Diego, CA, April.

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915-945. https://doi.org/10.3102/00028312038004915

Howard, S. K. (2013). Risk-aversion: Understanding teachers' resistance to technology integration. *Technology, Pedagogy and Education, 22*(3), 357–372. https://doi.org/10.1080/1475939X.2013.802995

Ibrahim, Z., & Al-Hoorie, A. (2018). Shared, sustained flow: Triggering motivation with collaborative projects. *ELT Journal*, *73*(1), 1-10. http://dx.doi.org/10.1093/elt/ccy025

Joo, Y. J., Lim, K. Y., & Kim, S. M. (2012). A model for predicting learning flow and achievement in corporate e-learning. *Journal of Educational Technology & Society*, *15*(1), 313–325.

Kessler, G. (2018). Technology and the future of language teaching. *Foreign Language Annals, 51*(1), 205-218. https://doi.org/10.1111/flan.12318

Killi, K. (2005). Content creation challenges and flow experience in educational games: The IT Emperor case. *Internet & Higher Education*, *8*(3), 183-198. http://dx.doi.org/10.1016/j.iheduc.2005.06.001

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: What is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6-36. https://doi.org/10.1080/17439884.2013.770404

Konradt, U., Filip, R., & Hoffmann, S. (2003). Flow experience and positive affect during hypermedia learning. *British Journal of Educational Technology*, *34*(3), 309-327. https://doi.org/10.1111/1467-8535.00329

Li, R., Meng, Z., Tian, M., Zhang, Z., & Xiao, W. (2019). Modelling Chinese EFL learners' flow experiences in digital game-based vocabulary learning: The roles of learner and contextual factors. *Computer Assisted Language Learning*, *34*(4), 483–505. https://doi.org/10.1080/09588221.2019.1619585

Liu, H., & Song, X. (2021). Exploring "Flow" in young Chinese EFL learners' online English learning activities. *System*, *96*, 102-125. https://doi.org/10.1016/j.system.2020.102425

Mohammad-Salehi, B., & Vaez-Dalili, M. (2022). Examining EFL teachers' perceptions of technological pedagogical content knowledge and web 2.0 technologies using a structural equation modeling technique. *Journal of Modern Research in English Language Studies*, *9*(2), 51-76. https://doi.org/10.30479/jmrels.2021.14550.1779

Montoro, A. B., & Gil, F. (2019). Exploring flow in pre-service primary teachers doing measurement tasks. In M. S. Hannula et al. (Eds.), *Affect and mathematics education* (pp. 283-308). Springer, Cham. https://doi.org/10.1007/978-3-030-13761-8_13

Nakamura, J., and Csikszentmihalyi, M. (2002). *The concept of flow.* In C. R. Synder & S. J. Lopez (Eds.), *Handbook of positive psychology,* (pp. 89–105). Oxford University Press. https://doi.org/10.1007/978-3-030-13761-813

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, *92(3)*, 544-555. https://doi.org/10.1037/0022-0663.92.3.544

Ro, Y. K., Guo, Y. M., & Klein, B. D. (2018). The case of flow and learning revisited. *Journal of Education for Business*, *93*(3), 128-141. https://doi.org/10.1080/08832323.2017.1417229

Rodríguez-Ardura, I., & Meseguer-Artola, A. (2021). Flow experiences in personalised e-learning environments and the role of gender and

academic performance. *Interactive Learning Environments*, *29*(1), 59-82. https://doi.org/10.1080/10494820.2019.1572628

Rodríguez-Sánchez, A., Salanova, M., Cifre, E., & Schaufeli, W. B. (2011). When good is good: A virtuous circle of self-efficacy and flow at work among teachers. *Revista de Psicología Social*, *26*(3), 427-441. https://doi.org/10.1174/021347411797361257

Rossin, D., Ro, Y. K., Klein, B. D., & Guo, Y. M. (2009). The effects of flow on learning outcomes in an online information management course. *Journal of Information Systems Education*, *20*(3), 87-98.

Rubie-Davies, C. M., Flint, A., & McDonald, L. G. (2012). Teacher beliefs, teacher characteristics, and school contextual factors: What are the relationships? *British Journal of Educational Psychology*, *82*(2), 270-288. https://doi.org/10.1111/j.2044-8279.2011.02025.x

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and in-service teacher preparation. *Journal of Teacher Education, 54*(4), 297-310. https://doi.org/10.1177/0022487103255985

Shernoff, D. J., Csikszentmihalyi, M., Shneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly*, *18*(2), 158-176.

Shim, S. S., Finch, W. H., Cho, Y., & Knapke, M. (2022). Understanding teachers' job satisfaction and flow: the dual process of psychological needs. *Educational Psychology, 42*(3), 316–333. https://doi.org/10.1080/01443410.2021.1985970

Shin, N. (2006). Online learner's 'flow' experience: An empirical study. *British Journal of Educational Technology*, *37*(5), 705–720. https://doi.org/10.1111/j.1467-8535.2006.00641.x

Skadberg, Y. X., & Kimmel, J. R. (2004). Visitors' flow experience while browsing a Web site: Its measurement, contributing factors, and consequences. *Computers in Human Behavior*, *20*(3), 403-422. https://doi.org/10.1016/S0747-5632(03)00050-5

Sobhanmanesh, A. (2022). English as a foreign language teacher flow: How do personality and emotional intelligence factor in? *Frontiers in Psychology, 13*, 793955. https://doi.org/10.3389/fpsyg.2022.793955

Tardy, C. M., & Snyder, B. (2004). That's why I do it: Flow and EFL teachers' practices. *ELT Journal*, *58*(2), 118-128. https://doi.org/10.1093/elt/58.2.118

Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Educational Technology Research and Development, 65*, 555-575. https://doi.org/10.1007/s11423-016-9481-2

Wang, P. Y., Chiu, M. C., & Lee, Y. T. (2021). Effects of video lecture presentation style and questioning strategy on learner flow experience. *Innovations in Education and Teaching International, 57*(4), 473-483. https://doi.org/10.1080/14703297.2020.1754272

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record, 104*(3), 482-515. https://doi.org/10.1111/1467-9620.00170

Appendices

Appendix A

Interview Protocol

1. How did you feel when you started teaching reading course online?
    a) Do you think it was very difficult to complete? Why? What was your feeling? What was the problem?
    b) Did you find some effective ways to solve the problems? What was your feeling during your looking for the solutions and the moment you solved the problems?
    c) Did you have your own personal goals or plans to complete this course in addition to your organization's requirements? Would you show me some examples, if you have?
2. During your course completion, how did you solve the problems you encountered?
    a) Did you notice the time passing? Why?
    b) Were you distracted during your online class? Why?
    c) Did you have some interactions with your students, peer teachers or friends in doing the tasks of teaching reading course?
3. After you completing the course online, what were your feelings?
    a) Were you satisfied with your achievement? Why and why not?
    b) Did you have some achievements, for instance, improvement on your teaching skills in teaching reading course online?
    c) Did you find any change of your attitudes towards the reading course tasks? Why?

Appendix B
Teacher Educators' Flow in Completing Online Reading Skills Course
Name: _____
Duration of online teaching: _____minutes
Gender: ○Male   ○Female (Please tick the appropriate one)
Teaching Experience: …………. (years)
Please tick one number which suits you appropriately. The numbers stand for

> 5=totally suitable for me   4= suitable for me   3=not clear
> 2= unsuitable for me   1 = totally unsuitable for me

Q01	I know clearly what the course requires doing.	5	4	3	2	1
Q02	Before starting the course, I know clearly about the content of course tasks.	5	4	3	2	1
Q03	The requirement of the course is clearly defined.	5	4	3	2	1
Q04	Before starting the course, I have prepared for the emerging questions.	5	4	3	2	1
Q05	I have sufficient Internet skills needed for the online reading course.	5	4	3	2	1
Q06	I would be able to finish a more advanced reading course than this.	5	4	3	2	1
Q07	Sometimes it is difficult for me to pronounce the vocabulary in the reading texts accurately.	5	4	3	2	1
Q08	It is difficult for me to keep up with this course.	5	4	3	2	1
Q09	This course is too demanding for me.	5	4	3	2	1
Q10	It is hard for me to complete the course tasks.	5	4	3	2	1
Q11	I enjoy teaching a reading course in a virtual space.	5	4	3	2	1
Q12	I am attracted to the topics and content of this course.	5	4	3	2	1
Q13	Doing this course is a visually pleasing experience.	5	4	3	2	1
Q14	The course content is **not** boring.	5	4	3	2	1
Q15	In online class, I upload the reading comprehension text on the screen, making sure the students see the text.	5	4	3	2	1
Q16	I remember vividly the way in which the contents were presented on the screen.	5	4	3	2	1
Q17	I screen the reading contents and go directly to the part I need to work on.	5	4	3	2	1
Q18	I have a clear memory of my students' ideas about the class and the context even after the class is over.	5	4	3	2	1
Q19	I go over every piece of information in the text on the screen.	5	4	3	2	1
Q20	I enjoy the learning experience this course offers me.	5	4	3	2	1
Q21	I have sufficient language skills to finish this course.	5	4	3	2	1
Q22	During online class, I have a feeling of concentration.	5	4	3	2	1
Q23	When disturbed by a phone call or person while giving the lecture, I am annoyed.	5	4	3	2	1

Q24	Generally, I exchange ideas with my colleagues about my teaching reading course.	5 4 3 2 1
Q25	Before or after course, I will compare my teaching with other teachers.	5 4 3 2 1
Q26	Generally, I exchange ideas with the head of the department about my teaching.	5 4 3 2 1
Q27	When teaching reading, I'm unaware of what is going on around me.	5 4 3 2 1
Q28	I work with peer teachers to cope with the reading tasks.	5 4 3 2 1
Q29	I'm unconscious of the passage of time while teaching.	5 4 3 2 1
Q30	Sometimes the teaching time becomes longer than my plan.	5 4 3 2 1
Q31	I feel that I am accomplishing something important while teaching.	5 4 3 2 1
Q32	Being occupied with the reading task, I would forget other engagements.	5 4 3 2 1
Q33	I have gained more knowledge about the real function of reading course after its completion.	5 4 3 2 1
Q34	I feel that my teaching skills are continuously growing due to a variety of tasks which I've finished.	5 4 3 2 1
Q35	It is worthwhile to keep teaching an online reading course.	5 4 3 2 1
Q36	After doing this course, I feel that I have learned more about how to teach reading course.	5 4 3 2 1
Q37	After doing this reading course, I want to find out more about this course.	5 4 3 2 1
Q38	I will return to this course to gain more skills about how to teach reading.	5 4 3 2 1
Q39	After teaching reading tasks, I'm more interested to teach this course.	5 4 3 2 1
Q40	How much have you learned from this course?" ("0" meant nothing, and "9" meant more than any learning experience I had ever had before)	