Students' Flow Experience of Using AI-Powered Online English Learning Platforms

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Abstract

Objectives: This research aims to explain the impact of flow's antecedents on flow experience. Furthermore, this research explores the intention of students to continue using online AI-powered English learning platforms. *Methodology:* This study gathered data from 300 online students enrolled in AI-powered English learning platforms in Taiwan, with data collection facilitated by a research company in the country. *Findings:* According to the findings, flow was significantly associated with continuous intention. In terms of antecedents of flow, information quality, service support quality, and intrinsic motivation were significant, whereas confirmation, service quality, and instructor quality were not significant. Flow was found to have significant associations with perceived usefulness and satisfaction. Furthermore, confirmation significantly impacted perceived usefulness and satisfaction. Moreover, perceived usefulness was significantly associated with satisfaction but had no association with continuous intention. Lastly, both intrinsic motivation and satisfaction were associated with continuous intention. *Novelty/Improvement:* This research delves into the dynamic interplay between students' experiences and the adoption of AI-powered online English learning platforms. The study employed a comprehensive framework, including flow, a technology acceptance model, motivation, and an expectation confirmation model.

Keywords: Flow; Technology Acceptance Model; Expectation Confirmation Model; AI-Powered Platforms; Online English Learning; Intrinsic Motivation.

1. Introduction

The rise in research studying the efficacy of cost-effective artificial intelligence (AI) tools like online language learning platforms and chatbots employed for learning a second language has become increasingly evident [1, 2]. The AI tools provide personalized lessons and a relaxed learning environment to their users [3, 4]. Online learners perceive interactions with AI to be more entertaining as compared to conventional instructor-based learning [5]. Despite the significant advantages offered by AI learning tools, there is still inadequate research related to the dynamic changes in human-computer interactions and the way different students approach or learn from these online platforms [1]. Researchers can use this understanding to design a modified AI model for language learning [5, 6]. Additionally, the theory of flow (FL) is implicated in the sense of presence and embodiment in smart AI learning, emphasizing that engagement in challenging tasks matching personal skills leads to a state of intense focus, forgetfulness of external distractions, and extreme pleasure [7, 8]. In this state, learners enter a "flow" when fully absorbed in an empirical task, particularly when teachers design activities with clear goals, integrate activity and insight, and present comparatively difficult tasks. In this immersive state, learners creatively complete tasks through their own experiences and sense-

making, unconsciously withdrawing defenses and achieving heightened concentration. This culminates in a "peak experience and complete satisfaction (SAT)," ultimately enhancing cognitive and communicative abilities [7, 9]. Previous research on learning explained the flow experience of users while using mobile devices [10]. This type of mobile learning offers learners a flexible and convenient learning experience unconstrained by time and space. Yang's [10] research found a significant association between FL and continuous intention (CI) to use mobile devices for learning. Previous research has implied a significant association between FL and continuous intention (CI) [11–14]. Hence, this study aims to investigate the significance of online students' flow experiences on their CI to use AI-powered online learning platforms.

The revised DeLone & McLean information system (IS) success model, a focal point in IS research, posits that IS success hinges on the evaluation of information quality (INFQ), system quality (SQ), and service quality. These IS success factors subsequently impact the user's SAT and the system's CI. A high-quality IS correlates with increased user SAT and continued usage [15]. INFQ, SQ, and service quality are consistently identified as pivotal elements influencing users' acceptance of IS [16, 17]. This study aims to propose a model incorporating INFQ, SQ, and service quality within the framework of the updated IS success model. In the context of online learning, service quality encompasses support delivered by instructors, divided into service support quality (SSQ) and instructor quality (INSQ) dimensions [18]. A previous study on IS targeted the use of the metaverse in an intangible cultural heritage context [19]. Cao's [19] study employed SQ and INFQ to measure the impact of the Metaverse application on the FL experience of Gen-Zers' participants. A significant impact was discovered between the employment of Metaverse and FL experience. DeLone & McLean's [15] external variables are integrated with FL and the expectation confirmation model (ECM). Consequently, five quality aspects—INFQ, SQ, SSQ, and INSQ—along with ECM's confirmation (CONF) are posited as significant antecedents to FL [20]. Hence, this research aims to explore the impacts of antecedents, including INFQ, SQ, SSQ, INSQ, and CONF, on the FL of online students.

Motivation, defined as an inherent unconscious drive toward the intricate development of an individual's mental structures [21], is a multifaceted concept within the realm of learning. Learning motivation revolves around the interplay between the learner's beliefs about what will transpire and the perceived value or appeal of the anticipated outcome [22]. Given the breadth of motivation, its comprehensive exploration remains a challenge in research [23]. Recognizing the social and cultural influences on second language learning, social psychologists have delved into motivation in language learning [24]. The self-determination theory introduces two distinct motivation types: intrinsic and extrinsic [25]. While extrinsic motivation is rooted in external factors and outcomes, this study exclusively focuses on the intrinsic motivation (IM) perspective. Intrinsic motivation entails behavior propelled by internal factors and inherent value to the individual, irrespective of the final result [26]. Previous survey research on IM employed the Eudaimonic Identity Theory as its theoretical background. The findings of this study indicated a positive association between IM and FL experience [27]. Previous research suggests that intrinsically motivated students demonstrate greater persistence in the face of academic challenges compared to their extrinsically motivated counterparts [28]. Previously, IM was found to be significantly associated with FL [29] and CI [30, 31]. Consequently, this research aims to investigate the relationships of IM with FL and CI of online students.

Recent research highlights specific variables critical for comprehending the factors influencing the CI to engage with e-learning. Within the Technology Acceptance Model (TAM), extensive evidence underscores the pivotal role of perceived usefulness (PU) and perceived ease of use (PE) in modeling users' intentions and SAT with ongoing technology use. Notably, when addressing technology use, PU emerges as more influential than PE [32]. This study strategically narrows its focus on PU, which has demonstrated efficacy in exploring sustained technology use [33]. The PU serves as a foundational element for assessing individuals' CI to use. PU reflects the extent to which an individual believes that utilizing a technological system enhances user performance [33]. Significantly, PU's significance primarily manifests during the initial stages of technology adoption [34, 35]. PU is found to have significant associations with SAT [11, 36] and CI [37]. In addition, FL was also found to be significantly associated with SAT [11]. Hence, this study aims to explore the relationship of PU with FL and the relationship of FL with SAT. Furthermore, this study analyzes the impact of PU on CI. Previously, SAT was found to be significantly associated with CI [38]. Lastly, this research also aims to find the impact of SAT on CI.

The present study stands out for its thorough investigation into students' engagement and usage intentions regarding AI-powered online English learning platforms, incorporating various theoretical frameworks such as flow theory [39], TAM [40], ECM [41], and intrinsic motivation [27] theories. While prior research has typically examined these frameworks in isolation, this study offers a unique approach by integrating them to provide a holistic understanding of student involvement in online learning environments. By addressing this scientific gap, the research offers a nuanced analysis of the factors shaping students' intentions to use such platforms, thereby contributing significantly to the literature. Through its robust methodology and comprehensive conceptual framework, this study serves to bridge the theory-practice gap in educational technology. Recognizing the importance of understanding students' engagement in digital learning, this research holds substantial implications for platform developers and educators, aiding in the design of effective learning environments that foster lifelong learning in the digital era and informing educational policies and

practices accordingly. This research aims to explore the intention of students to continue using online AI-powered English learning platforms. Hence, this research aims to address the following research objectives: First, it aims to explain the impact of FL on CI. Second, it aims to explore the impacts of Fl antecedents, including SSQ, SQ, INFQ, INSQ, IQ, IM, and ECM's CONF, on Fl. Third, it employs TAM's PU to explore its impacts on FL, SAT, and CI. Lastly, this study investigates the impact of SAT on CI.

This article is structured as follows: The next section begins with a literature review covering FL, the TAM model, the ECM model, and IM in the context of online learning. A conceptual framework is then presented, integrating these theories to understand factors influencing student experiences. Furthermore, the methodology section outlines research design, data collection, and analysis techniques. Next, the findings are presented on the associations between FL, PU, SAT, IM, CONF, and CI in terms of platform usage. In addition, the discussion section interprets the results, addresses study limitations, and proposes future research directions. Finally, the conclusion summarizes key findings, emphasizing their significance for understanding student engagement and persistence and offering implications for platform developers and educators.

2. Theoretical Background and Hypotheses Development

2.1. Flow and Continuous Intention

Csikszentmihalyi characterizes "flow" as a state that individuals encounter upon complete absorption in a particular activity, applicable to various daily pursuits like sports, watching movies, or reading [42]. This immersive experience, marked by a sense of time standing still, tends to foster a desire to repeat the behavior for the pleasure it brings [43]. In the realm of online English learning platforms, regardless of age group, the primary motivation for student engagement lies in these platforms' ability to enhance SAT by delivering superior value, thereby driving continuous usage [44]. The intention to persist in using a specific service hinges on users' evaluations of the facility, directly influencing their decision to continue utilizing the service. For sustained value creation and profitability, ongoing efforts are crucial in devising policies that enhance users' SAT and intention to reuse a particular service, necessitating continuous examination [43, 45, 46]. The following hypothesis is proposed:

Hypothesis 1. Flow significantly impacts continuous intention.

2.2. Antecedents of Flow

CONF, particularly linked to performance, denotes validation regarding the perceived and estimated effectiveness of utilizing online platforms [47]. Engaging in collaborative systems like video calls, chat services, or discussion rooms within online learning platforms can stimulate a state of FL, encouraging a perception of complete engagement in activities [48]. Users' CONF of prospects related to online learning platforms significantly influences their IM to use these platforms, subsequently impacting the SAT and the CI to utilize them [49]. As students fully immerse themselves in online English learning, deriving enjoyment from platform collaborations, they come to recognize the platform's benefits [20, 50]. The literature supports the hypothesis that users' CONF of performance prospects on online learning platforms is intricately linked to their IM, SAT, and sustained intention to use these platforms.

Hypothesis 2a. Confirmation significantly impacts flow.

INFQ, as defined by DeLone & McLean [15], encompasses the contents and format quality generated by an IS [51, 52], measured through dimensions such as precision, fullness, currency, efficacy, significance, span, and relevance of information [16, 17]. On online learning platforms, if the information provided is consistently updated and sufficiently comprehensive, it aligns with learners' expectations, fostering clarity and comfort with the platform [20]. Moreover, when learners perceive the course content as beneficial and tailored to their needs within the e-learning system, it enhances their positive FL with the system [53]. This study posits that the perception of INFQ in the blended online learning platform significantly influences their FL, indicating a substantial impact of INFQ on the FL within the system. The following hypothesis is proposed.

Hypothesis 2b. Information quality significantly impacts flow.

SQ, defined by DeLone & McLean [15], pertains to the functionality quality inherent in an IS. It encompasses attributes such as accuracy, ease, productivity, flexibility, consistency, and sensitivity [15, 17]. In the realm of online learning platforms, learners' perception of system functionality, timely response, and effective communication with instructors and peers shapes their assessment of system usefulness [48, 54]. Furthermore, when instructors foster interactions among learners through the online learning platform, encouraging active engagement, learners are prone to experience a state of FL induced by the system [20, 55]. Thus, this study posits that perceived SQ within the blended online learning platform significantly influences the experience of FL induced by the system. Hence, the following hypothesis is proposed.

Hypothesis 2c. System quality significantly impacts flow.

SSQ pertains to the learner's perception of the overall quality of personal support services offered by the online learning platform [16, 54]. Acknowledged as a robust predictor, SSQ significantly influences learners' SAT and their CI toward the online learning platform [16]. Higher SSQ is associated with users becoming fully immersed and intensely enjoying their activities [52]. Consequently, this study posits that the perceived SSQ within the blended online learning platform significantly impacts the FL induced by the system.

Hypothesis 2d. Support service quality significantly impacts flow.

INSQ, as defined by Choi et al. [53], encompasses learners' perception of the instructor's attitude, encompassing factors such as response relevance, training technique, and support provided through the online learning platform. This dimension of INSQ, involving personality and training technique, holds sway over learners' interest, involvement, and overall motivation toward online learning [18]. Particularly when instructors adopt collaborative training techniques and foster communications between learners and themselves through the online learning platform, learners are more likely to plunge enthusiastically into these exchanges, leading to a heightened experience of FL in the e-learning process [53]. Thus, this research suggests that perceived INSQ through the blended online learning platform significantly influences the FL induced by the system. Hence, the following hypothesis is proposed.

Hypothesis 2e. Instructor quality significantly impacts flow.

Ibáñez et al. [56] observed that students highly motivated to self-direct their tasks, as anticipated by their FL experience, exhibited enhanced IM. Gardner [57] defines motivation in language learning as an internal drive linked to the effort and eagerness to acquire a new language. This implies that motivation is intricately connected to an individual's inclination to encompass the desire for language learning and the potential for experiencing FL during the language learning process [29]. While some studies, such as Filsecker & Hickey [58], suggest that students' IM does not necessarily cultivate FL experience in disciplinary contexts, another body of research, like Khang et al. [59], indicates that IM factors may indeed be correlated with the experience of FL. Consequently, the hypothesis emerges on how IM for learning influences the encounter with FL. Hence, the following hypothesis is proposed.

Hypothesis 2f. Intrinsic motivation significantly impacts flow.

2.3. Flow and Perceived Usefulness

To align the FL with the foundational TAM of the association, it is proposed that the level of intelligent dissonance linked to executing technological activities diminishes when online users experience FL. This is because they perceive investing time in a specific activity as beneficial [60]. Bem's [61] self-perception theory suggests that people strive to rationalize their actions and mitigate cognitive dissonance by aligning inconsistent opinions, views, or conduct. When in a state of intellectual absorption, individuals derive pleasure and SAT from engaging in technological activities, leading to a reduction in conflicts during this pleasant and enjoyable state [62–65]. Building on these concepts, it is hypothesized that profoundly motivated students would perceive online learning platforms as beneficial. Hence, the following hypothesis is proposed.

Hypothesis 3. Flow significantly impacts perceived usefulness.

2.4. Flow and Satisfaction

The connection between FL and SAT in online learning platforms is established when online students engage in enjoyable activities associated with these platforms, leading to heightened SAT levels [66]. Essentially, online students may strategically reduce the evaluation process's complexity to foster a positive mindset toward employing online learning platforms. Several studies have consistently shown a positive association between FL and SAT in the context of employing online platforms [11, 67–69]. Research frameworks, like the Stimulus-Organism-Response (SOR) theory, have been employed to investigate online user behavior, revealing a noteworthy significant association relationship between FL and SAT [70]. A research framework exploring online buying intent identified FL as a crucial antecedent of SAT in the hotel industry [66]. Another study proposed a correlation structure involving enjoyment, considered a form of FL experience, and rational responses as two mediators influencing SAT levels stemming from technological and personal drivers [71]. Therefore, online students' FL is anticipated to exert a profound impact on their SAT [69]. Hence, the following hypothesis is proposed.

Hypothesis 4. Flow significantly impacts satisfaction.

2.5. Expectation Confirmation Model (ECM): Confirmation, Perceived Usefulness and Satisfaction

The CONF of performance on online learning platforms is characterized as the preliminary acceptance belief, dynamically influencing a student's PU and post-adoption beliefs regarding the online platform's usage [69]. Bhattacherjee [72] asserts that the CONF of online learning platforms plays a pivotal role in determining PU, particularly in the context of investigating CI. Numerous studies have utilized the ECM to explore online learning platform usage,

consistently finding that performance CONF significantly influences PU [73-76]. Notably, Lu et al. [75] explained a research framework to examine loyalty in cell phone advertising, applying the ECM. Their study revealed a positive and significant association between online platform performance CONF and PU. The following hypothesis is formulated.

Hypothesis 5. Confirmation significantly impacts perceived usefulness.

The ECM posits a substantial link between performance CONF and SAT [77]. Consequently, the relationship between the CONF and students' SAT is conceptualized based on this theoretical framework. The ECM suggests a connection between the CONF of online learning platforms and students' SAT in the examination of continuous platform usage intent [11, 72]. Many researchers have applied the ECM to scrutinize this association across various online contexts, including impulse trade, social commerce, and mobile trade [75, 78]. Specifically, several research studies have indicated a positive correlation between CONF and SAT [69, 73]. Hence, the following proposed hypothesis stems from this theoretical discussion.

Hypothesis 6. Confirmation significantly impacts satisfaction.

2.6. Technology Acceptance Model (TAM) with Satisfaction and Continuous Intention

PU is characterized as a post-adoption acceptance in the utilization of information technology and is intricately linked to SAT [69]. Grounded in the ECM, online users' PU exerts a substantial influence on their SAT. In the realm of online learning tasks, students are anticipated to foster a positive attitude toward their engagement on online platforms, including the SAT, as these platforms are perceived as valuable tools for exploring and accessing information related to the provided services [68, 69, 79]. Furthermore, a study investigating the motivational factors influencing the purchase intent for paid mobile phone applications utilized the ECM, depicting PU as a precursor to SAT. The findings revealed a noteworthy relationship between PU and SAT [73]. Hence, the following hypothesis is proposed.

Hypothesis 7a. Perceived usefulness significantly impacts satisfaction.

In the investigation of relationships within an online platform's context, the ECM serves as a foundational model. Bhattacherjee [72] applied this theory to scrutinize the connection between SAT and the CI of utilizing online platforms. The study's outcomes supported the appropriateness of employing the ECM in the context of online platforms, particularly in understanding post-adoption behavior in online services [80]. Additionally, within the literature on information technology adoption, PU emerged as a pivotal factor influencing users' CI [69]. Accordingly, the ECM posits that users' PU of online learning platforms significantly influences their CI to use these platforms [72].

Hypothesis 7b. Perceived usefulness significantly impacts continuous intention.

2.7. Intrinsic Motivation of Online Learning and Continuous Intention

Numerous studies have substantiated the IM connections between psychological influences and behavior consequences [81-84]. The realm of motivation is acknowledged as a multi-dimensional and intricate core process [85]. Drawing from the self-determination theory (SDT), IM is characterized by three fundamental needs: competency, relatedness, and autonomy [30]. The SOR framework is widely applied in consumer behavior research [86-89] and provides a framework for understanding the intricacies of IM. In a recent study conducted on the scope of online learning, the surge in popularity of web-based course management prompted an exploration of the nexus between the Self-Determination Theory and technology utilization [31]. Raman et al.'s [31] quantitative study, which targeted 370 postgraduate students in Malaysia, endeavors to scrutinize the impact of IM (autonomy, competence, and relatedness) on the CI. Notably, Raman et al.'s [31] results unveiled that IM significantly influenced the CI, with all nine latent variables exhibiting a moderate effect on the actual utilization of technology. The implications of these findings are substantial, prompting a call for further research to delve into the nuanced impacts of IM on the practical usage of learning frameworks, urging forthcoming research to explore diverse constructs influencing the reception of such systems, encompassing scientific, academic, and content information [31]. Hence, the following hypothesis is formulated.

Hypothesis 8. Intrinsic motivation significantly impacts continuous intention.

2.8. Satisfaction and Continuous Intention

The ECM posits that the persistence of an individual's use of online platforms hinges on three key variables: SAT, CONF, and post-adoption acceptances encapsulated in PU. Notably, the SAT of online students has emerged as a pivotal factor influencing their CI to use online learning platforms. Insights from marketing research underscore that users' inclination to repeat behaviors is primarily rooted in their SAT levels. Building on this congruence between online users' SAT and CI, it is hypothesized that the interplay of SAT, CONF, and PU plays a fundamental role in shaping users' ongoing engagement with online learning platforms [48, 90-92].

Hypothesis 8. Satisfaction significantly impacts continuous intention.

Figure 1, shows the flowchart of the research methodology through which the objectives of this study were achieved.
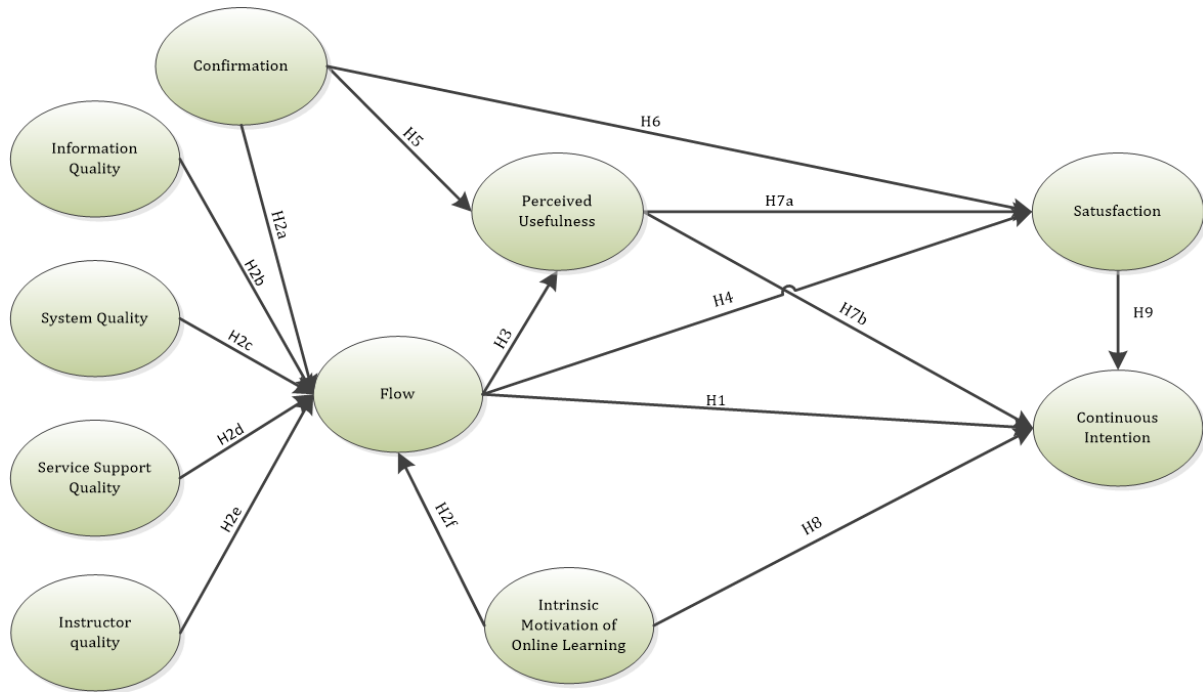

Figure 1. Theoretical Framework of the Research

3. Methodology

This study gathered data from users of online AI-powered learning platforms in Taiwan, with data collection facilitated by a research company in the country. Utilizing a convenient sampling technique, a total of 300 online students were selected for participation. The research employed a questionnaire distributed among the students, who utilized a Likert scale to express their agreement or disagreement with measurement items. In this research, FL, INFQ, SQ, SSQ, and INSQ were modified and measured using the items proposed by Cheng's [20] research. The items to determine PU, SAT, and CI were modified from Zhao & Khan's [11] study. PE was measured using Xu et al.'s [93] study. Lastly, IM was analyzed utilizing the items proposed by Hong et al.'s [29] study. This study employed a 7-point Likert scale to contemplate the attitudes of users in an efficient way. A pretest was completed with a sample of 95 users, and a response rate of 91.36% was achieved.

4. Data Analysis

This study employed two sequential stages for the estimation of partial least squares (PLS). The initial focus is on the reliability analysis, and later, the empirical analysis is conducted [94]. PLS is recognized to be one of the most effective tools for analyzing the associations between constructs and the measurement items of those constructs [95]. PLS was employed for its ability to tackle variations in the normality of data, hence making it an ideal choice to investigate the associations of irregularly distributed variables. Consequently, it can be inferred that PLS is the ideal choice for analyzing dynamic research frameworks [11, 93, 96].

4.1. Convergent and Discriminant Validity

In the first step of the PLS-SEM approach, the outer model was analyzed with the help of convergent and discriminant reliability. The factor loading analysis was conducted and it was found that all the constructs' indicators had factor loading above the threshold value of 0.50 [97-99]. The composite reliability (CR) was above the threshold of 0.60, hence indicating internal reliability [100]. Furthermore, the values of Cronbach's alpha were also higher than the threshold, indicating the reliability of the constructs [101]. In addition, the Average Variance Extracted (AVE) values also surpassed the 0.50 threshold and were in between the range of 0.657 to 0.883, implying acceptance of the significance of AVE values [102] (see Table 1).

Discriminant validity implies the degree to which two constructs can be differentiated. This study used the HTMT Heterotrait-Monotrait Ratio to analyze the discriminant validity. The findings presented in Table 2 indicate that the values are below the 0.85 threshold, which indicates that the HTMT values are significant, and hence, no issues related to the discriminant validity are found [103].

Table 1. Convergent Validity

Constructs	Indicators	Factor Loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
CONF	CONF1	0.900	0.910	0.937	0.788
	CONF2	0.926			
	CONF3	0.901			
	CONF4	0.820			
CI	CI1	0.772	0.824	0.884	0.657
	CI2	0.825			
	CI3	0.886			
	CI4	0.754			
FL	FL1	0.924	0.822	0.918	0.849
	FL2	0.918			
INFQ	INFQ1	0.874	0.877	0.915	0.730
	INFQ2	0.838			
	INFQ3	0.865			
	INFQ4	0.839			
INSQ	INSQ1	0.936	0.712	0.843	0.657
	INSQ2	0.924			
IM	IM1	0.894	0.920	0.943	0.806
	IM2	0.920			
	IM3	0.877			
	IM4	0.899			
PU	PU1	0.946	0.956	0.968	0.883
	PU2	0.953			
	PU3	0.950			
	PU4	0.909			
SAT	SAT1	0.884	0.902	0.932	0.773
	SAT2	0.901			
	SAT3	0.921			
	SAT4	0.808			
SSQ	SSQ1	0.882	0.843	0.905	0.761
	SSQ2	0.930			
	SSQ3	0.800			
SQ	SQ1	0.817	0.876	0.915	0.730
	SQ2	0.844			
	SQ3	0.879			
	SQ4	0.876			

Note: CON = Confirmation, CI = Continuous Intention, FL = Flow, INFQ = Information Quality, INSQ = Instructor's Quality, IM = Intrinsic Motivation, PU = Perceived Usefulness, SAT = Satisfaction, SSQ = Service Support Quality, SQ = Service Quality.

Table 2. Heterotrait–Monotrait ratio (HTMT) – Matrix

Constructs	CON	CI	FL	INFQ	INSQ	IM	PU	SAT	SSQ	SQ
CON										
CI	0.600									
FL	0.494	0.845								
INFQ	0.600	0.622	0.557							
INSQ	0.697	0.523	0.498	0.605						
IM	0.531	0.582	0.494	0.558	0.613					
PU	0.682	0.564	0.577	0.801	0.623	0.496				
SAT	0.436	0.520	0.406	0.542	0.394	0.455	0.477			
SSQ	0.569	0.584	0.559	0.603	0.712	0.525	0.611	0.305		
SQ	0.587	0.649	0.552	0.723	0.705	0.593	0.610	0.348	0.686	

Note: CON = Confirmation, CI = Continuous Intention, FL = Flow, INFQ = Information Quality, INSQ = Instructor's Quality, IM = Intrinsic Motivation, PU = Perceived Usefulness, SAT = Satisfaction, SSQ = Service Support Quality, SQ = Service Quality.

The Fornell and Larcker criteria were employed in this study to assess the correlations among the latent constructs. Utilizing the square root of Average Variance Extracted (AVE) to measure latent constructs, as outlined by Ab Hamid et al. [104], Table 3 indicates that the adjusted variance estimates (AVEs) for each construct surpass that of competing constructs. Additionally, Table 3 reveals that all constructs demonstrate low collinearity with other variables.

Table 3. Fornell-Larcker criterion

Constructs	CON	CI	FL	INFQ	INSQ	IM	PU	SAT	SSQ	SQ
CON	0.888									
CI	0.524	0.811								
FE	0.430	0.696	0.921							
INFQ	0.543	0.530	0.474	0.854						
INSQ	0.577	0.432	0.388	0.491	0.811					
IM	0.489	0.509	0.431	0.506	0.514	0.898				
PU	0.642	0.502	0.512	0.733	0.529	0.468	0.940			
SAT	0.403	0.453	0.359	0.486	0.337	0.420	0.448	0.879		
SSQ	0.499	0.496	0.474	0.523	0.578	0.464	0.551	0.278	0.872	
SQ	0.528	0.556	0.469	0.631	0.591	0.527	0.558	0.315	0.586	0.854

Note: CON = Confirmation, CI = Continuous Intention, FL = Flow, INFQ = Information Quality, INSQ = Instructor's Quality, IM = Intrinsic Motivation, PU = Perceived Usefulness, SAT = Satisfaction, SSQ = Service Support Quality, SQ = Service Quality.

Furthermore, this study also employed the cross-loadings approach to evaluate the discriminant validity. According to Table 4 of the research, it was found that all the constructs indicated a fair level of validity because the loadings of its indicator's values were highest in the latent structure [105-107]. The highest factor loadings in the latent structure are highlighted in yellow in Table 4.

Table 4. Cross-Loadings

Constructs	CON	CI	FL	INFQ	INSQ	IM	PU	SAT	SSQ	SQ
CONF1	0.900	0.445	0.334	0.424	0.509	0.427	0.511	0.347	0.453	0.457
CONF2	0.926	0.468	0.375	0.463	0.491	0.429	0.569	0.361	0.441	0.460
CONF3	0.901	0.467	0.385	0.445	0.522	0.421	0.517	0.375	0.425	0.432
CONF4	0.820	0.472	0.421	0.572	0.519	0.451	0.659	0.343	0.447	0.512
CI1	0.309	0.772	0.563	0.348	0.225	0.318	0.290	0.311	0.244	0.308
CI2	0.486	0.825	0.611	0.428	0.423	0.409	0.425	0.317	0.422	0.485
CI3	0.426	0.886	0.620	0.423	0.365	0.417	0.425	0.334	0.455	0.493
CI4	0.469	0.754	0.459	0.518	0.376	0.503	0.480	0.512	0.475	0.505
FL1	0.407	0.643	0.924	0.428	0.351	0.396	0.483	0.373	0.440	0.403
FL2	0.386	0.639	0.918	0.446	0.364	0.398	0.460	0.287	0.432	0.462
INFQ1	0.429	0.428	0.417	0.874	0.358	0.400	0.659	0.511	0.391	0.450
INFQ2	0.480	0.490	0.422	0.838	0.454	0.436	0.614	0.392	0.507	0.504
INFQ3	0.442	0.419	0.363	0.865	0.406	0.399	0.654	0.376	0.392	0.513
INFQ4	0.498	0.470	0.411	0.839	0.457	0.489	0.579	0.378	0.490	0.689
INSQ1	0.553	0.461	0.378	0.496	0.936	0.519	0.522	0.353	0.559	0.613
INSQ2	0.536	0.392	0.345	0.422	0.924	0.459	0.472	0.291	0.570	0.539
IM1	0.463	0.476	0.414	0.508	0.431	0.894	0.457	0.476	0.458	0.425
IM2	0.469	0.487	0.415	0.493	0.468	0.920	0.465	0.410	0.427	0.436
IM3	0.401	0.423	0.352	0.389	0.471	0.877	0.351	0.276	0.380	0.535
IM4	0.418	0.436	0.360	0.415	0.479	0.899	0.397	0.329	0.393	0.511
PU1	0.624	0.497	0.492	0.702	0.512	0.451	0.946	0.412	0.560	0.561
PU2	0.570	0.447	0.495	0.710	0.468	0.445	0.953	0.426	0.504	0.487
PU3	0.610	0.468	0.465	0.716	0.475	0.433	0.950	0.419	0.507	0.517
PU4	0.609	0.474	0.472	0.626	0.529	0.429	0.909	0.428	0.499	0.530
SAT1	0.412	0.473	0.383	0.459	0.359	0.348	0.451	0.884	0.332	0.333
SAT2	0.369	0.387	0.333	0.441	0.303	0.414	0.413	0.901	0.256	0.295
SAT3	0.344	0.382	0.302	0.411	0.282	0.391	0.367	0.921	0.234	0.237
SAT4	0.268	0.330	0.214	0.393	0.215	0.324	0.326	0.808	0.117	0.221
SSQ1	0.347	0.434	0.422	0.449	0.471	0.394	0.450	0.210	0.882	0.456
SSQ2	0.514	0.492	0.477	0.499	0.541	0.435	0.544	0.284	0.930	0.559
SSQ3	0.449	0.356	0.320	0.416	0.510	0.385	0.443	0.232	0.800	0.527
SQ1	0.458	0.481	0.365	0.605	0.492	0.474	0.487	0.276	0.551	0.817
SQ2	0.437	0.423	0.383	0.549	0.495	0.457	0.485	0.282	0.446	0.844
SQ3	0.408	0.460	0.411	0.442	0.513	0.410	0.427	0.244	0.472	0.879
SQ4	0.500	0.532	0.438	0.570	0.518	0.466	0.510	0.276	0.535	0.876

Note: CON = Confirmation, CI = Continuous Intention, FL = Flow, INFQ = Information Quality, INSQ = Instructor's Quality, IM = Intrinsic Motivation, PU = Perceived Usefulness, SAT = Satisfaction, SSQ = Service Support Quality, SQ = Service Quality.

4.2. Empirical Results

Path analysis for the study framework assessment was performed using Smart PLS 4. The empirical results were calculated in this stage with the help of a p-value and a t-value. The hypotheses were accepted if the t-value is greater than 1.96 and the p-value is less than 0.05.

The empirical results are shown in Table 5 and Figure 2. According to the findings, FL was in a significant association with CI (β = 0.520, t-value = 9.308). In terms of antecedents of FL, INFQ (β = 0.169, t-value = 2.552), SSQ (β = 0.206, t-value = 2.890), and IM (β = 0.144, t-value = 2.133) were significant, whereas, CONF (β = 0.121, t-value = 1.788), SQ (β = 0.121, t-value = 1.528), and INSQ (β = -0.033, t-value = 0.366) were not significant. FL was found to have significant associations with PU (β = 0.287, t-value = 5.167) and SAT (β = 0.153, t-value = 2.530). Furthermore, CONF significantly impacted PU (β = 0.520, t-value = 9.854) and SAT (β = 0.172, t-value = 2.198). Moreover, PU was significantly associated with SAT (β = 0.263, t-value = 2.931) but had no association with CI (β = 0.080, t-value = 1.352). Lastly, both IM (β = 0.181, t-value = 3.084) and SAT (β = 0.157, t-value = 3.213) were associated with CI.

Table 5. Empirical Results

Hypotheses	Path Coefficient (β)	T Values	P values
H1: FL → CI	0.520	9.308	0.000
H2a: CONF → FL	0.121	1.788	**0.074**
H2b: INFQ → FL	0.169	2.552	0.011
H2c: SQ → FL	0.121	1.528	**0.127**
H2d: SSQ → FL	0.206	2.890	0.004
H2e: INSQ → FL	-0.033	0.366	**0.714**
H2f: IM → FL	0.144	2.133	0.033
H3: FL → PU	0.287	5.167	0.000
H4: FL → SAT	0.153	2.530	0.011
H5: CONF → PU	0.520	9.854	0.000
H6: CONF → SAT	0.172	2.198	0.028
H7a: PU → SAT	0.263	2.931	0.003
H7b: PU → CI	0.080	1.352	**0.176**
H8: IM → CI	0.181	3.084	0.002
H9: SAT → CI	0.157	3.213	0.001

Note 1: CON = Confirmation, CI = Continuous Intention, FE = Flow, INFQ = Information Quality, INSQ = Instructor's Quality, IM = Intrinsic Motivation, PU = Perceived Usefulness, SAT = Satisfaction, SSQ = Service Support Quality, SQ = Service Quality.

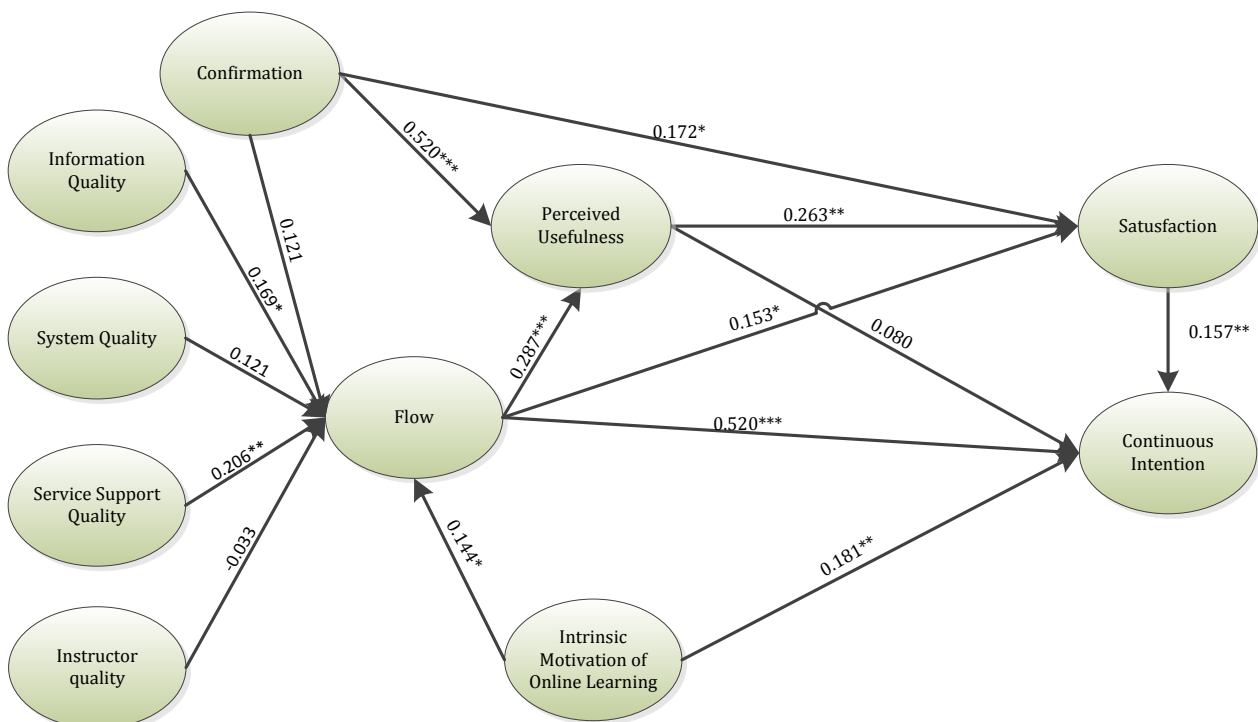**Note 2:** The p-values in bold indicate insignificant relationships.

Figure 2. Research Results (Note. * p < 0.05, ** p < 0.01, *** p < 0.001)

5. Discussions

5.1. Comparison with Other Studies

According to the current findings of this research, FL was significantly associated with CI. This result can be somewhat compared to earlier research by Zhao & Khan [11]. Zhao & Khan's [11] study was grounded in a comprehensive framework encompassing FL antecedents and the ECM. Zhao & Khan's [11] study explored the impact of FL on the CI of online students. Zhao & Khan's [11] research focused on online students in Taiwan. A sample of 500 participants was chosen, and data was collected via a survey facilitated by a Taiwanese marketing research organization. Zhao & Khan's [11] results indicated a significant correlation between online students' FL and CI. Antecedents like perceived enjoyment, situational involvement, and challenge exhibited positive associations with the FL, while CONF and perceived vividness showed no significant impact. Moreover, Zhao & Khan's [11] study identified significant relationships between FL, CONF, PU, SAT, and CI. Another study also identified the significance between FL and CI [10]. Yang [10] expressed the importance of mobile learning and its role in promoting the FL experience. According to Yang [10] the proliferation of mobile devices in recent decades has fostered the growth of mobile learning, offering learners a convenient and unrestricted means of learning. Yang's [10] study employed an online survey and the findings indicated that FL experience positively correlated with CI.

In terms of antecedents, the current study indicated significant relationships between SSQ and INFQ on FL, whereas CONF, SQ, and INSQ were not found to be significant antecedents of FL. In terms of antecedents, the variables of IS results can be compared to an earlier study conducted by Cao et al. [19]. According to Cao et al. [19], the utilization of the Metaverse in fostering the development of intangible cultural heritage has shown significant potential to amplify the intention of Gen-Zers to participate. Cao et al.'s [19] research constructed a theoretical model drawing upon the model of information systems (IS) and FL. Through an empirical investigation and analysis based on survey data collected in China, Cao et al.'s [19] results indicated that the utilization of the Metaverse (INFQ and SQ) can indeed heighten participants' engagement in the communication of intangible cultural heritage, hence, impacting FL experience. These findings offer fresh perspectives for exploring the implications and ramifications of Metaverse application, as well as practical insights for its utilization in the development and communication of intangible cultural heritage. The results of antecedents, including SSQ, SQ, IQ, and INQ, can be somewhat linked to a prior study conducted by Cheng [20]. Cheng's [20] study proposed a novel hybrid model, integrating the ECM, FL, and DeLone & McLean IS model. Cheng's [20] study objective was to assess the impact of quality factors, serving as antecedents, on their CI employing online learning platforms. Cheng's [20] study collected data from 378 nurses across five Taiwanese hospitals. The findings of Cheng's [20] study revealed that IQ, SQ, SSQ, and INQ significantly contributed to PU, CONF, and FL. On the other hand, according to the present results, CONF did not have a significant association with FL, which is similar to the findings of Zhao & Khan's [11] study.

Furthermore, the results of the present study indicated a significant association between IM and FL. The result can be compared to earlier research conducted by Waterman & Schwartz [27]. According to Waterman & Schwartz's [27] findings, IM was found to significantly impact FL. According to Waterman & Schwartz's [27] study Eudaimonic Identity Theory poses a central inquiry regarding the criteria for determining optimal identity-related goals, values, beliefs, and roles a person might adopt. Hence, in their study, they targeted 607 adults to respond to the Questionnaire. Waterman and Schwartz's [27] research examined four predictors of intrinsic motivation along with four types of subjective experiences linked to intrinsic motivation. Another previous study on IM conducted by Hong et al. [29] shared similar results. Hong et al.'s [29] study addressed the challenges faced by Taiwanese Students of Southeast Asian Heritage Learning Chinese (SSAHLC). To alleviate the difficulties faced by SSAHCL, a Chinese radical learning game (CRLG) was designed. Hong et al.'s [29] study collected data from 78 participants and revealed positive correlations between IM, self-efficacy, FL, and learning. Hong et al.'s [29] study suggested that language instructors can leverage the CRLG to improve the language capabilities among SSAHLC.

Additionally, according to the present results, FL was found to impact SAT significantly. This result can be compared to an earlier research by Kong & Wang [108]. Kong & Wang's [108] research extends cognitive evaluation theory by integrating FL to address the motivational consequences of learners in programming learning, focusing on the influence of parental roles. Kong & Wang's [108] research collected data from parents of children aged 6–12 who participated in a 2-day coding fair and utilized multigroup structural equation modeling to examine how the parents' perceptions and support impacted the students' FL through the mediating role of motivation. Kong & Wang's [108] research results highlighted that parents' PU and support significantly fostered FL in visual programming.

In addition, the present study indicated a significant relationship between TAM's PU and SAT. This is somewhat similar to an earlier study conducted by Harianto & Ellyawati [109]. Harianto & Ellyawati's [109] research endeavors to assess the impact of PU, risk, and trust on customer loyalty, with consumer SAT acting as a mediating construct. Harianto & Ellyawati's [109] study employed a survey method and collected data from 232 consumers born between 1997 and 2012 who had engaged with the TikTok Shop at least twice. Harianto & Ellyawati's [109] research findings revealed that PU lacks a positive influence on SAT and loyalty, whereas trust and risk significantly impact consumer SAT.

Furthermore, according to the present study findings, TAM's PU was found not to impact CI significantly. This result is somewhat comparable to earlier research conducted by Al-Maroof et al. [37]. Al-Maroof et al.'s [37] study conducted an online survey at a United Arab Emirates university and collected data from teachers and students. Al-Maroof et al.'s [37] study results underscore the pivotal role of PU, self-efficacy, and PE for both teachers and students in influencing their CI to use technology.

Lastly, the present study also provided sufficient evidence for the significance of IM and SAT on CI. Earlier studies somewhat support these results. Earlier research also indicated relationships of IM [30, 31] and SAT [11, 36] on CI.

5.2. Implications of the Research

This study offers several theoretical implications for academic scholars conducting research on education and learning platforms. This research delves into the dynamic interplay between students' experiences and the adoption of AI-powered online English learning platforms [110]. The study employed a comprehensive framework, including FL [93, 111], TAM [112, 113], ECM [41, 114], and IM [115]. The incorporation of FL sheds light on the immersive and optimal learning states that students may attain during their engagement with these platforms, thereby contributing to a deeper understanding of the subjective experience [10]. The TAM elucidates the factors influencing CI use of these platforms [116–118], while the ECM provides insights into the role of expectations in shaping user SAT [119]. Additionally, the incorporation of IM acknowledges the inherent drive students possess for autonomous learning and its impact on sustained engagement [31].

For educators, the application of FL implies a deliberate focus on crafting instructional content and activities that foster an immersive and optimal learning experience [11]. Platform developers, informed by TAM, can enhance user interfaces and functionalities to align with the acceptance and adoption expectations of students [112]. Administrators, wielding the insights from ECM, are prompted to manage and align student expectations effectively [120]. In a practical sense, these implications guide educators, developers, and administrators toward strategic decisions that enhance user engagement and SAT, ultimately shaping a more effective and sustainable landscape for AI-powered online English learning platforms [5, 110, 121].

6. Conclusion

This study contributes to advancing our comprehension of students' engagement and persistence in utilizing AI-driven online English learning platforms. The results underscore the significant linkage between students' sense of flow and their perceptions of the platform's utility and satisfaction, indicating that a positive perception enhances the likelihood of experiencing flow. Moreover, intrinsic motivation emerges as a pivotal factor influencing students' inclination to continue platform usage, emphasizing the need to nurture students' internal drive and involvement in the learning process. While initial expectations influence perceived utility and satisfaction, they do not singularly dictate sustained usage behavior. By amalgamating principles from flow theory, the technology acceptance model (TAM), and the expectation confirmation model (ECM), this study offers a holistic framework for investigating students' experiences with AI-based online learning platforms, presenting valuable insights for platform developers and educators aiming to enrich student engagement and retention in digital learning environments. In conclusion, the study underscores the significance of designing AI-powered online learning platforms that not only fulfill students' informational and service requisites but also cultivate intrinsic motivation and encourage a state of flow. Future research avenues may delve into additional factors shaping students' flow experiences and usage intentions, while also exploring potential variations across diverse cultural settings.

7. Declarations

7.1. Author Contributions

Conceptualization, C.W. and W.F.; methodology, C.W. and W.F.; software, C.W.; validation, W.F.; formal analysis, C.W.; investigation, C.W.; writing—original draft preparation, C.W. and W.F.; writing—review and editing, C.W. and W.F.; visualization, C.W.; supervision, W.F. All authors have read and agreed to the published version of the manuscript.

7.2. Data Availability Statement

The data presented in this study are available in the article.

7.3. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7.4. Institutional Review Board Statement

Not applicable.

7.5. Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

7.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. References

[1] Jeon, J., Lee, S., & Choe, H. (2023). Beyond ChatGPT: A conceptual framework and systematic review of speech-recognition chatbots for language learning. Computers and Education, 206, 104898. doi:10.1016/j.compedu.2023.104898.

[2] Lin, C. J., & Mubarok, H. (2021). Learning Analytics for Investigating the Mind Map-Guided AI Chatbot Approach in an EFL Flipped Speaking Classroom. In Educational Technology and Society (Vol. 24, Issue 4). Educational Technology & Society.

[3] Dizon, G., & Tang, D. (2020). Intelligent personal assistants for autonomous second language learning: An investigation of Alexa. JALT CALL Journal, 16(2), 107–120. doi:10.29140/jaltcall.v16n2.273.

[4] Moussalli, S., & Cardoso, W. (2020). Intelligent personal assistants: can they understand and be understood by accented L2 learners? Computer Assisted Language Learning, 33(8), 865–890. doi:10.1080/09588221.2019.1595664.

[5] Wang, X., Liu, Q., Pang, H., Tan, S. C., Lei, J., Wallace, M. P., & Li, L. (2023). What matters in AI-supported learning: A study of human-AI interactions in language learning using cluster analysis and epistemic network analysis. Computers and Education, 194, 104703. doi:10.1016/j.compedu.2022.104703.

[6] Niu, C., Li, X., Dai, R., & Wang, Z. (2022). Artificial intelligence-incorporated membrane fouling prediction for membrane-based processes in the past 20 years: A critical review. Water Research, 216, 118299. doi:10.1016/j.watres.2022.118299.

[7] Shu, X., & Gu, X. (2023). An Empirical Study of a Smart Education Model Enabled by the Edu-Metaverse to Enhance Better Learning Outcomes for Students. Systems, 11(2), 75. doi:10.3390/systems11020075.

[8] Liu, G., Wang, X., Gao, N., & Hu, H. (2021). From Virtual Reality to Metaverse: A New Direction of Online Education. Modern Distance Education Research, 33(6), 12–22.

[9] Csikszentmihalyi, M. (2014). Flow and Education. In: Applications of Flow in Human Development and Education: The collected works of Mihaly Csikszentmihalyi, 129-151. doi:10.1007/978-94-017-9094-9_6.

[10] Yang, X. (2024). Mobile learning application characteristics and learners' continuance intentions: The role of flow experience. Education and Information Technologies, 29(2), 2259–2275. doi:10.1007/s10639-023-11910-6.

[11] Zhao, H., & Khan, A. (2022). The Students' Flow Experience with the Continuous Intention of Using Online English Platforms. Frontiers in Psychology, 12, 807084–807084. doi:10.3389/fpsyg.2021.807084.

[12] Wang, H., Ding, J., Akram, U., Yue, X., & Chen, Y. (2021). An empirical study on the impact of e-commerce live features on consumers' purchase intention: From the perspective of flow experience and social presence. Information (Switzerland), 12(8), 324. doi:10.3390/info12080324.

[13] Wang, H., & Lee, K. (2020). Getting in the flow together: The role of social presence, perceived enjoyment and concentration on sustainable use intention of mobile social network game. Sustainability (Switzerland), 12(17), 6853. doi:10.3390/SU12176853.

[14] Chen, C. C., & Lin, Y. C. (2018). What drives live-stream usage intention? The perspectives of flow, entertainment, social interaction, and endorsement. Telematics and Informatics, 35(1), 293–303. doi:10.1016/j.tele.2017.12.003.

[15] DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19(4), 9–30. doi:10.1080/07421222.2003.11045748.

[16] Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. International Journal of Human Computer Studies, 64(8), 683–696. doi:10.1016/j.ijhcs.2006.01.003.

[17] Kim, T. G., Lee, J. H., & Law, R. (2008). An empirical examination of the acceptance behaviour of hotel front office systems: An extended technology acceptance model. Tourism Management, 29(3), 500–513. doi:10.1016/j.tourman.2007.05.016.

[18] Ozkan, S., & Koseler, R. (2009). Multi-dimensional evaluation of E-learning systems in the higher education context: An empirical investigation of a computer literacy course. Proceedings - Frontiers in Education Conference, FIE, 53(4), 1285–1296. doi:10.1109/FIE.2009.5350590.

[19] Cao, Y., Qu, X., & Chen, X. (2024). Metaverse application, flow experience, and Gen-Zers' participation intention of intangible cultural heritage communication. Data Science and Management, 7(2), 144–153. doi:10.1016/j.dsm.2023.12.004.

[20] Cheng, Y. M. (2014). Extending the expectation-confirmation model with quality and flow to explore nurses' continued blended e-learning intention. Information Technology and People, 27(3), 230-258. doi:10.1108/ITP-01-2013-0024.

[21] Oxford, R., & Shearin, J. (1994). Language Learning Motivation: Expanding the Theoretical Framework. The Modern Language Journal, 78(1), 12–28. doi:10.1111/j.1540-4781.1994.tb02011.x.

[22] Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2014). Motivation in education: Theory, Research, and Applications. Pearson Education, New Jersey, United States.

[23] De Brabander, C. J., & Martens, R. L. (2014). Towards a unified theory of task-specific motivation. Educational Research Review, 11, 27-44. doi:10.1016/j.edurev.2013.11.001.

[24] Dörnyei, Z., & Ushioda, E. (2021). Teaching and Researching Motivation. Routledge, London, United Kingdom. doi:10.4324/9781351006743.

[25] Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. Journal of Research in Personality, 19(2), 109–134. doi:10.1016/0092-6566(85)90023-6.

[26] Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. Contemporary Educational Psychology, 25(1), 54–67. doi:10.1006/ceps.1999.1020.

[27] Waterman, A. S., & Schwartz, S. J. (2024). Identity Contributions to a Life Well-Lived: A Study of the Relationship of Eudaimonic Well-Being to Intrinsic Motivation for Identity-Related Activities. Identity, 24(1), 1–15. doi:10.1080/15283488.2023.2233990.

[28] Boyd, F. B. (2002). Motivation to continue: Enhancing literacy learning for struggling readers and writers. Reading and Writing Quarterly, 18(3), 257–277. doi:10.1080/07487630290061818.

[29] Hong, J. C., Hwang, M. Y., Tai, K. H., & Lin, P. H. (2017). Intrinsic motivation of Chinese learning in predicting online learning self-efficacy and flow experience relevant to students' learning progress. Computer Assisted Language Learning, 30(6), 552–574. doi:10.1080/09588221.2017.1329215.

[30] Chen, X., Fang, S., Li, Y., & Wang, H. (2019). Does identification influence continuous e-commerce consumption? The mediating role of intrinsic motivations. Sustainability (Switzerland), 11(7), 1944. doi:10.3390/su11071944.

[31] Raman, A., Thannimalai, R., Rathakrishnan, M., & Ismail, S. N. (2022). Investigating the influence of intrinsic motivation on behavioral intention and actual use of technology in moodle platforms. International Journal of Instruction, 15(1), 1003–1024. doi:10.29333/iji.2022.15157a.

[32] Cai, J., Yang, H. H., Gong, D., MacLeod, J., & Zhu, S. (2019). Understanding the continued use of flipped classroom instruction: a personal beliefs model in Chinese higher education. Journal of Computing in Higher Education, 31(1), 137–155. doi:10.1007/s12528-018-9196-y.

[33] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly: Management Information Systems, 13(3), 319–339. doi:10.2307/249008.

[34] Deng, G., & Zhang, J. (2023). Technological pedagogical content ethical knowledge (TPCEK): The development of an assessment instrument for pre-service teachers. Computers and Education, 197(2), 123–149. doi:10.1016/j.compedu.2023.104740.

[35] Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) In Higher Education Institutions. Journal of Online Learning and Teaching, 11(2), 210–233.

[36] Ashfaq, M., Yun, J., Waheed, A., Khan, M. S., & Farrukh, M. (2019). Customers' Expectation, Satisfaction, and Repurchase Intention of Used Products Online: Empirical Evidence from China. SAGE Open, 9(2), 2158244019846212. doi:10.1177/2158244019846212.

[37] Al-Maroof, R. S., Alhumaid, K., & Salloum, S. (2021). The continuous intention to use e-learning, from two different perspectives. Education Sciences, 11(1), 1–20. doi:10.3390/educsci11010006.

[38] Liu, Z., Yu, P., Liu, J., Pi, Z., & Cui, W. (2023). How do students' self-regulation skills affect learning satisfaction and continuous intention within desktop-based virtual reality? A structural equation modelling approach. British Journal of Educational Technology, 54(3), 667–685. doi:10.1111/bjet.13278.

[39] Hsu, C. L., & Lin, J. C. C. (2023). The effects of gratifications, flow and satisfaction on the usage of livestreaming services. Library Hi Tech, 41(3), 729–748. doi:10.1108/LHT-02-2021-0069.

[40] Alturki, U., & Aldraiweesh, A. (2022). Adoption of Google Meet by Postgraduate Students: The Role of Task Technology Fit and the TAM Model. Sustainability (Switzerland), 14(23), 15765. doi:10.3390/su142315765.

[41] Gupta, A., Dhiman, N., Yousaf, A., & Arora, N. (2021). Social comparison and continuance intention of smart fitness wearables: an extended expectation confirmation theory perspective. Behaviour and Information Technology, 40(13), 1341–1354. doi:10.1080/0144929X.2020.1748715.

[42] Pelet, J. É., Ettis, S., & Cowart, K. (2017). Optimal experience of flow enhanced by telepresence: Evidence from social media use. Information and Management, 54(1), 115–128. doi:10.1016/j.im.2016.05.001.

[43] Park, G., Chen, F., & Cheng, L. (2021). A study on the millennials usage behavior of social network services: Effects of motivation, density, and centrality on continuous intention to use. Sustainability (Switzerland), 13(5), 1–21. doi:10.3390/su13052680.

[44] Kwak, K. T., Choi, S. K., & Lee, B. G. (2014). SNS flow, SNS self-disclosure and post hoc interpersonal relations change: Focused on Korean Facebook user. Computers in Human Behavior, 31(1), 294–304. doi:10.1016/j.chb.2013.10.046.

[45] Campbell, C., Ferraro, C., & Sands, S. (2014). Segmenting consumer reactions to social network marketing. European Journal of Marketing, 48(3–4), 432–452. doi:10.1108/EJM-03-2012-0165.

[46] Hwang, H. S., & Cho, J. (2018). Why Instagram? Intention to continue using Instagram among Korean college students. Social Behavior and Personality, 46(8), 1305–1315. doi:10.2224/SBP.6961.

[47] Halilovic, S., & Cicic, M. (2013). Antecedents of information systems user behaviour-extended expectation-confirmation model. Behaviour and Information Technology, 32(4), 359–370. doi:10.1080/0144929X.2011.554575.

[48] Lee, M. C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model. Computers and Education, 54(2), 506–516. doi:10.1016/j.compedu.2009.09.002.

[49] Sørebø, Ø., Halvari, H., Gulli, V. F., & Kristiansen, R. (2009). The role of self-determination theory in explaining teachers' motivation to continue to use e-learning technology. Computers and Education, 53(4), 1177–1187. doi:10.1016/j.compedu.2009.06.001.

[50] Tseng, A. H., & Hsia, J. W. (2008). The impact of internal locus of control on perceived usefulness and perceived ease of use in e-learning: An extension of the technology acceptance model. Proceedings of the 2008 International Conference on Cyberworlds, CW 2008, 42(2), 815–819. doi:10.1109/CW.2008.109.

[51] Masri, N. W., You, J. J., Ruangkanjanases, A., Chen, S. C., & Pan, C. I. (2020). Assessing the effects of information system quality and relationship quality on continuance intention in e-tourism. International Journal of Environmental Research and Public Health, 17(1), 174. doi:10.3390/ijerph17010174.

[52] Hariguna, T., Lai, M. T., Hung, C. W., & Chen, S. C. (2017). Understanding information system quality on public e-government service intention: An empirical study. International Journal of Innovation and Sustainable Development, 11(2–3), 271–290. doi:10.1504/IJISD.2017.083290.

[53] Choi, D. H., Kim, J., & Kim, S. H. (2007). ERP training with a web-based electronic learning system: The flow theory perspective. International Journal of Human Computer Studies, 65(3), 223–243. doi:10.1016/j.ijhcs.2006.10.002.

[54] Cho, V., Cheng, T. C. E., & Lai, W. M. J. (2009). The role of perceived user-interface design in continued usage intention of self-paced e-learning tools. Computers and Education, 53(2), 216–227. doi:10.1016/j.compedu.2009.01.014.

[55] Young Choi, S., Lee, H., & Yoo, Y. (2010). The impact of information technology and transactive memory systems on knowledge sharing, application, and team performance: A field study. MIS Quarterly: Management Information Systems, 34(4), 833–854. doi:10.2307/25750708.

[56] Ibáñez, M. B., Di-Serio, Á., Villarán-Molina, D., & Delgado-Kloos, C. (2016). Support for Augmented Reality Simulation Systems: The Effects of Scaffolding on Learning Outcomes and Behavior Patterns. IEEE Transactions on Learning Technologies, 9(1), 46–56. doi:10.1109/TLT.2015.2445761.

[57] Gardner, R. C. (2020). The socio-educational model of second language acquisition. The Palgrave Handbook of Motivation for Language Learning, 6(1), 21–37. doi:10.1007/978-3-030-28380-3_2.

[58] Filsecker, M., & Hickey, D. T. (2014). A multilevel analysis of the effects of external rewards on elementary students' motivation, engagement and learning in an educational game. Computers and Education, 75, 136–148. doi:10.1016/j.compedu.2014.02.008.

[59] Khang, H., Kim, J. K., & Kim, Y. (2013). Self-traits and motivations as antecedents of digital media flow and addiction: The Internet, mobile phones, and video games. Computers in Human Behavior, 29(6), 2416–2424. doi:10.1016/j.chb.2013.05.027.

[60] Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Quarterly: Management Information Systems, 24(4), 665–694. doi:10.2307/3250951.

[61] Bem, D. J. (1972). Self-perception theory. Advances in experimental social psychology: Academic Press, Volume 6, 1-62.

[62] Khan, S., & Khan, A. (2020). Consumer E-Loyalty for E-Grocery Shopping in a Metro City of India. International Journal of E-Adoption, 12(2), 16–33. doi:10.4018/ijea.2020070102.

[63] Hyun, H., Thavisay, T., & Lee, S. H. (2022). Enhancing the role of flow experience in social media usage and its impact on shopping. Journal of Retailing and Consumer Services, 65, 102492. doi:10.1016/j.jretconser.2021.102492.

[64] Mahfouz, A. Y., Joonas, K., & Opara, E. U. (2020). An overview of and factor analytic approach to flow theory in online contexts. Technology in Society, 61, 101228. doi:10.1016/j.techsoc.2020.101228.

[65] Agung Purwanto, Nurahman, & Andy Ismail. (2020). Exploring Consumers' Acceptance of E-Marketplace Using Tam and Flow Theory. Indonesian Journal of Applied Research (IJAR), 1(3), 170–182. doi:10.30997/ijar.v1i3.76.

[66] Ali, F. (2016). Hotel website quality, perceived flow, customer satisfaction and purchase intention. Journal of Hospitality and Tourism Technology, 7(2), 213–228. doi:10.1108/JHTT-02-2016-0010.

[67] Hsu, C. L., Chang, K. C., & Chen, M. C. (2012). The impact of website quality on customer satisfaction and purchase intention: Perceived playfulness and perceived flow as mediators. Information Systems and E-Business Management, 10(4), 549–570. doi:10.1007/s10257-011-0181-5.

[68] Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of literature. International Journal of Information Management, 43, 1–14. doi:10.1016/j.ijinfomgt.2018.05.005.

[69] Wu, I. L., Chiu, M. L., & Chen, K. W. (2020). Defining the determinants of online impulse buying through a shopping process of integrating perceived risk, expectation-confirmation model, and flow theory issues. International Journal of Information Management, 52, 102099. doi:10.1016/j.ijinfomgt.2020.102099.

[70] Hsu, M. H., Chang, C. M., Chu, K. K., & Lee, Y. J. (2014). Determinants of repurchase intention in online group-buying: The perspectives of DeLone & McLean is success model and trust. Computers in Human Behavior, 36, 234–245. doi:10.1016/j.chb.2014.03.065.

[71] Rose, S., Clark, M., Samouel, P., & Hair, N. (2012). Online Customer Experience in e-Retailing: An empirical model of Antecedents and Outcomes. Journal of Retailing, 88(2), 308–322. doi:10.1016/j.jretai.2012.03.001.

[72] Bhattacherjee, A. (2017). Understanding information systems continuance Understanding information systems continuance: an expectation-confirmation model. MIS Quarterly, 2017148.

[73] Hsu, C. L., & Lin, J. C. C. (2015). What drives purchase intention for paid mobile apps?-An expectation confirmation model with perceived value. Electronic Commerce Research and Applications, 14(1), 46–57. doi:10.1016/j.elerap.2014.11.003.

[74] Kang, Y. S., Hong, S., & Lee, H. (2009). Exploring continued online service usage behavior: The roles of self-image congruity and regret. Computers in Human Behavior, 25(1), 111–122. doi:10.1016/j.chb.2008.07.009.

[75] Lu, C. C., Wu, I. L., & Hsiao, W. H. (2019). Developing customer product loyalty through mobile advertising: Affective and cognitive perspectives. International Journal of Information Management, 47, 101–111. doi:10.1016/j.ijinfomgt.2018.12.020.

[76] Tsao, W. Y. (2013). Application of Expectation Confirmation Theory to Consumers' Impulsive Purchase Behavior for Products Promoted by Showgirls in Exhibits. Journal of Promotion Management, 19(3), 283–298. doi:10.1080/10496491.2013.770811.

[77] Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. Journal of Marketing Research, 17(4), 460. doi:10.2307/3150499.

[78] Li, C. Y., & Ku, Y. C. (2018). The power of a thumbs-up: Will e-commerce switch to social commerce? Information and Management, 55(3), 340–357. doi:10.1016/j.im.2017.09.001.

[79] Luo, M. M., & Chea, S. (2018). Cognitive appraisal of incident handling, affects, and post-adoption behaviors: A test of affective events theory. International Journal of Information Management, 40, 120–131. doi:10.1016/j.ijinfomgt.2018.01.014.

[80] Lin, C. S., Wu, S., & Tsai, R. J. (2005). Integrating perceived playfulness into expectation-confirmation model for web portal context. Information and Management, 42(5), 683–693. doi:10.1016/j.im.2004.04.003.

[81] Charbonneau, D., Barling, J., & Kelloway, E. K. (2001). Transformational leadership and sports performance: The mediating role of intrinsic motivation. Journal of Applied Social Psychology, 31(7), 1521–1534. doi:10.1111/j.1559-1816.2001.tb02686.x.

[82] Prabhu, V., Sutton, C., & Sauser, W. (2008). Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation. Creativity Research Journal, 20(1), 53–66. doi:10.1080/10400410701841955.

[83] Zapata-Phelan, C. P., Colquitt, J. A., Scott, B. A., & Livingston, B. (2009). Procedural justice, interactional justice, and task performance: The mediating role of intrinsic motivation. Organizational Behavior and Human Decision Processes, 108(1), 93–105. doi:10.1016/j.obhdp.2008.08.001.

[84] Fernet, C., Austin, S., Trépanier, S. G., & Dussault, M. (2013). How do job characteristics contribute to burnout? Exploring the distinct mediating roles of perceived autonomy, competence, and relatedness. European Journal of Work and Organizational Psychology, 22(2), 123–137. doi:10.1080/1359432X.2011.632161.

[85] Chen, K. C., & Jang, S. J. (2010). Motivation in online learning: Testing a model of self-determination theory. Computers in Human Behavior, 26(4), 741–752. doi:10.1016/j.chb.2010.01.011.

[86] Mehrabian, A., & Russell, J. A. (1974). An Approach to Environmental Psychology. MIT Press, Massachusetts, United States.

[87] Jacoby, J. (2002). Stimulus-organism-response reconsidered: An evolutionary step in modeling (consumer) behavior. Journal of Consumer Psychology, 12(1), 51–57. doi:10.1207/153276602753338081.

[88] Kim, J., & Lennon, S. J. (2013). Effects of reputation and website quality on online consumers' emotion, perceived risk and purchase intention: Based on the stimulus-organism-response model. Journal of Research in Interactive Marketing, 7(1), 33–56. doi:10.1108/17505931311316734.

[89] Sohaib, O., Kang, K., & Nurunnabi, M. (2019). Gender-based itrust in e-commerce: The moderating role of cognitive innovativeness. Sustainability (Switzerland), 11(1), 175. doi:10.3390/su11010175.

[90] Bearden, W. O., & Teel, J. E. (1983). Selected Determinants of Consumer Satisfaction and Complaint Reports. Journal of Marketing Research, 20(1), 21. doi:10.2307/3151408.

[91] Oliver, R. L. (1993). Cognitive, Affective, and Attribute Bases of the Satisfaction Response. Journal of Consumer Research, 20(3), 418. doi:10.1086/209358.

[92] Szymanski, D. M., & Henard, D. H. (2001). Customer satisfaction: A meta-analysis of the empirical evidence. Journal of the Academy of Marketing Science, 29(1), 16–35.

[93] Xu, Y., Wang, Y., Khan, A., & Zhao, R. (2021). Consumer Flow Experience of Senior Citizens in Using Social Media for Online Shopping. Frontiers in Psychology, 12, 12. doi:10.3389/fpsyg.2021.732104.

[94] Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. Strategic Management Journal, 20(2), 195–204. doi:10.1002/(sici)1097-0266(199902)20:2<195::aid-smj13>3.0.co;2-7.

[95] Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. MIS Quarterly: Management Information Systems, 31(4), 623–656. doi:10.2307/25148814.

[96] Chin, W. W., Marcolin, B. L., & Newsted, P. R. (1996). a Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and Voice Mail Emotion/Adoption Study. Proceedings of the 17th International Conference on Information Systems, ICIS 1996, 14(2), 21–41.

[97] Hongsuchon, T., Rahardja, U., Khan, A., Wu, T. H., Hung, C. W., Chang, R. H., Hsu, C. H., & Chen, S. C. (2023). Brand Experience on Brand Attachment: The Role of Interpersonal Interaction, Feedback, and Advocacy. Emerging Science Journal, 7(4), 1232–1246. doi:10.28991/ESJ-2023-07-04-014.

[98] Guo, Z., Liu, G., Liu, Z., & Khan, A. (2023). Evaluating the Determinants of Young Runners' Continuance Intentions toward Wearable Devices. HighTech and Innovation Journal, 4(4), 720–738. doi:10.28991/HIJ-2023-04-04-02.

[99] Khan, A., Chen, C. C., Suanpong, K., Ruangkanjanases, A., Kittikowit, S., & Chen, S. C. (2021). The impact of CSR on sustainable innovation ambidexterity: The mediating role of sustainable supply chain management and second-order social capital. Sustainability (Switzerland), 13(21), 12160. doi:10.3390/su132112160.

[100] Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. Administrative Science Quarterly, 36(3), 421. doi:10.2307/2393203.

[101] Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. Research in Science Education, 48(6), 1273–1296. doi:10.1007/s11165-016-9602-2.

[102] Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. European Business Review, 26(2), 106–121. doi:10.1108/EBR-10-2013-0128.

[103] Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. doi:10.1007/s11747-014-0403-8.

[104] Ab Hamid, M. R., Sami, W., & Mohmad Sidek, M. H. (2017). Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion. Journal of Physics: Conference Series, 890(1). doi:10.1088/1742-6596/890/1/012163.

[105] Chen, C. C., Khan, A., Hongsuchon, T., Ruangkanjanases, A., Chen, Y. T., Sivarak, O., & Chen, S. C. (2021). The role of corporate social responsibility and corporate image in times of crisis: The mediating role of customer trust. International Journal of Environmental Research and Public Health, 18(16), 8275. doi:10.3390/ijerph18168275.

[106] Khan, A., Chen, L. R., & Hung, C. Y. (2021). The role of corporate social responsibility in supporting second-order social capital and sustainable innovation ambidexterity. Sustainability (Switzerland), 13(13), 6994. doi:10.3390/su13136994.

[107] Khan, A., Chen, C. C., Lu, K. H., Wibowo, A., Chen, S. C., & Ruangkanjanases, A. (2021). Supply chain ambidexterity and green scm: Moderating role of network capabilities. Sustainability (Switzerland), 13(11), 5974. doi:10.3390/su13115974.

[108] Kong, S. C., & Wang, Y. Q. (2021). The influence of parental support and perceived usefulness on students' learning motivation and flow experience in visual programming: Investigation from a parent perspective. British Journal of Educational Technology, 52(4), 1749–1770. doi:10.1111/bjet.13071.

[109] Harianto, E. F. E., & Ellyawati, J. (2023). The Influence of Perceived Usefulness, Trust, and Risk on Loyalty in the TikTok Shop: Test of Consumer Satisfaction as a Mediation Variable. Journal of Entrepreneurship & Business, 4(1), 13–23. doi:10.24123/jeb.v4i1.5390.

[110] Lund, B. D., & Wang, T. (2023). Chatting about ChatGPT: how may AI and GPT impact academia and libraries? Library Hi Tech News, 40(3), 26–29. doi:10.1108/LHTN-01-2023-0009.

[111] Kim, H., Kim, S. E., Park, K., & Tennessee, S. (2023). Exploring the role of flow experience and telepresence in virtual reality (VR) concerts. Journal of Travel and Tourism Marketing, 40(7), 568–582. doi:10.1080/10548408.2023.2276437.

[112] Al-Adwan, A. S., Li, N., Al-Adwan, A., Abbasi, G. A., Albelbisi, N. A., & Habibi, A. (2023). Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms. Education and Information Technologies, 28(11), 15381–15413. doi:10.1007/s10639-023-11816-3.

[113] Cheng, S. I., Chen, S. C., & Yen, D. C. (2015). Continuance intention of E-portfolio system: A confirmatory and multigroup invariance analysis of technology acceptance model. Computer Standards and Interfaces, 42, 17–23. doi:10.1016/j.csi.2015.03.002.

[114] Chen, S. C., Liu, M. L., & Lin, C. P. (2013). Integrating technology readiness into the expectation-confirmation model: An empirical study of mobile services. Cyberpsychology, Behavior, and Social Networking, 16(8), 604–612. doi:10.1089/cyber.2012.0606.

[115] Liu, R., Wang, L., Koszalka, T. A., & Wan, K. (2022). Effects of immersive virtual reality classrooms on students' academic achievement, motivation and cognitive load in science lessons. Journal of Computer Assisted Learning, 38(5), 1422–1433. doi:10.1111/jcal.12688.

[116] Almaiah, M. A., Al-Otaibi, S., Lutfi, A., Almomani, O., Awajan, A., Alsaaidah, A., Alrawad, M., & Awad, A. B. (2022). Employing the TAM Model to Investigate the Readiness of M-Learning System Usage Using SEM Technique. Electronics (Switzerland), 11(8), 1259. doi:10.3390/electronics11081259.

[117] Tao, Y. T., Lin, M. Der, & Khan, A. (2022). The impact of CSR on green purchase intention: Empirical evidence from the green building Industries in Taiwan. Frontiers in Psychology, 13, 13. doi:10.3389/fpsyg.2022.1055505.

[118] Rahardja, U., Chen, S. C., Lin, Y. C., Tsai, T. C., Aini, Q., Khan, A., Oganda, F. P., Dewi, E. R., Cho, Y. C., & Hsu, C. H. (2023). Evaluating the Mediating Mechanism of Perceived Trust and Risk toward Cryptocurrency: An Empirical Research. SAGE Open, 13(4), 21582440231217856. doi:10.1177/21582440231217854.

[119] Mamun, M. R. Al, Senn, W. D., Peak, D. A., Prybutok, V. R., & Torres, R. A. (2020). Emotional Satisfaction and IS Continuance Behavior: Reshaping the Expectation-Confirmation Model. International Journal of Human-Computer Interaction, 36(15), 1437–1446. doi:10.1080/10447318.2020.1752478.

[120] Baker-Eveleth, L., & Stone, R. W. (2015). Usability, expectation, confirmation, and continuance intentions to use electronic textbooks. Behaviour and Information Technology, 34(10), 992–1004. doi:10.1080/0144929X.2015.1039061.

[121] Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., … Wright, R. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. International Journal of Information Management, 71, 102642. doi:10.1016/j.ijinfomgt.2023.102642.

Appendix I: Questionnaire

Constructs		Measurement Items	References
Flow experience	1-	I am absorbed in what I am doing while using the online English learning platform.	Cheng [20]
	2-	I am often unable to keep track of the passage of time while using the online English learning platform.	
	3-	I find using the online English learning platform to be enjoyable	
Continuous intention	4-	I intend to continue using the online English learning platform in the future.	Cheng [20]
	5-	I will use the online English learning platform on a regular basis in the future.	
	6-	I will frequently use the online English learning platform in the future.	
	7-	My intentions are to continue using the online English learning platform rather than use any alternative means (traditional learning).	
Satisfaction	8-	I am content with the performance of the online English learning platform.	Cheng [20]
	9-	I am pleased with the experience of using the online English learning platform.	
	10-	I am happy with the functions provided by the online English learning platform.	
	11-	I am satisfied with the overall experience of using the online English learning platform.	
Information Quality	12-	The online English learning platform can provide me with new, updated, and sufficient learning contents.	Cheng [20]
	13-	The online English learning platform can provide learning contents that I need.	
	14-	The level of difficulty of the learning contents provided by the online English learning platform is appropriate.	
	15-	The delivery schedule of learning contents provided by the online English learning platform is flexible.	
System Quality	16-	The online English learning platform can allow me control over my learning activity.	Cheng [20]
	17-	The online English learning platform can present course materials in multimedia and readable format.	
	18-	The online English learning platform enables interactive communication between instructors and learners.	
	19-	I perceive that the response from the blended online English learning platform is fast, consistent, and reasonable.	
Service Support Quality	20-	I can acquire adequate support services from the help desk of the online English learning platform to help my learning.	Cheng [20]
	21-	I can acquire adequate support services from the service administrators of the online English learning platform to help my learning.	
	22-	Overall, the support services of the online English learning platform are satisfactory.	
Instructor Quality	23-	The instructor cares about learners' learning via the online English learning platform.	Cheng [20]
	24-	The instructor timely responds to learners' questions via the online English learning platform.	
	25-	The instructor is good at communicating with learners via the online English learning platform	
Confirmation	26-	My experience with using the online English learning platform was better than I expected.	Cheng [20]
	27-	The service level provided by the online English learning platform was better than I expected.	
	28-	My expectations from using the online English learning platform were confirmed.	
	29-	The online English learning platform can meet demands in excess of what I required for the service	
Perceived Usefulness	30-	Using the online English learning platform enhances my learning effectiveness.	Cheng [20]
	31-	Using the online English learning platform can improve my learning performance.	
	32-	Using the online English learning platform gives me greater control over learning.	
	33-	I find the online English learning platform to be useful in my learning	
Perceived Ease of Use	34-	Learning to use the online English learning platform for my English learning needs is easy for me.	Xu et al. [93]
	35-	The process of using the online English learning platform with regard to English learning is clear and understandable.	
	36-	I find the online English learning platform easy to use with regard to English learning.	
Intrinsic motivation of English Learning	37-	I often attempt to use online English learning platforms to enhance my English proficiency.	Hong et al. [29]
	38-	I use English to chat with my friends to improve my English proficiency.	
	39-	I watch TV programs with English subtitles to improve my ability to recognize more English words.	
	40-	I work hard on my English homework in order to improve my English.	