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Online interaction learning: A way towards sustainability and buoyant EFL students

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Abstract

The ability of students to deal with common academic difficulties is referred to as academic buoyancy. It can also be described as the capacity of students over obstacles and difficulties that are typical of the everyday school experience. The purpose of this research was to examine the connections between the academic buoyancy of Iranian university-level EFL students and their online interaction learning model. Online interaction learning seems to be a strong predictor of academic buoyancy. Academic buoyancy surveys and the online interaction learning model were given to students majoring in English translation and teaching English as a second, third, and final year of college. Both structural equation modeling and correlational studies found a statistically significant association between academic buoyancy, online interaction learning, and all of their components. The best predictors of academic buoyancy, according to regression analysis, were the components of *course material* and *instructor performance*. Taken together, the findings add to what is widely accepted about the online engagement tendency of university students and sheds light on the academic buoyancy constructs in higher education. However, more research on the role of buoyancy in relation to achievement and online tactics to increase individual students' achievement and overall online interaction learning model is warranted based on the findings of the present study.

Keywords: academic buoyancy, academic challenges, interactive learning, online interaction learning, sustainable education

Introduction

These days, there are a lot of different ways people can communicate thanks to the internet. There are greater constraints on individuality in higher and richer forms of communication. The internet has improved nearly every kind of mediated educational engagement, and it can even

help those that use it to supplement traditional classroom instruction. Building on constructivist theory of learning, Benbunan-Fich et al. (2005) created an online interaction learning model (OILM). By combining the views of Fosnot and Perry (2005), Benbunan-Fich et al. (2005) were able to construct a model of online learning that included inputs, processes and outputs. Details about the courses, teachers, EFL students and technology themselves served as inputs.

The educational process and context have relied heavily on interaction (Anderson et al., 2001). Despite this, there is a plethora of definitions given to the term "interaction" when describing the many forms of communication that take place in the context of education. In online classes, one kind of engagement is the ability of students to communicate with one another. Research has shown that students learn far more in online classes where they can talk to each other a lot (Kolloff, 2019). Students' ability to connect with one another is the key to fostering a sense of community, which in turn encourages students to think critically and creatively, and helps them develop their problem-solving and analytical abilities (Kolloff, 2019).

Students who engaged in more peer interaction also exhibited higher levels of learning and fulfillment, according to one study that examined the relationship between these three variables (Swan, 2020). Scores were much higher for students in an online class where there was a lot of interaction compared to the identical class where there was zero interaction (Beaudoin, 2020). The impact of interaction on students' sense of success and happiness is reflected in their test scores and performance (Roblyer & Ekhaml, 2019). According to Benbunan-Fich et al. (2005), constructivism is essentially the belief that when individuals encounter new information, they make adjustments to their preexisting knowledge by comparing it to their internalized knowledge constructs, which are derived from their past experience. As researchers take into account learning processes that include social contexts, like collaborative learning, Vygotsky's (1978) groundbreaking work in social constructivism has been revitalized in theories of online learning (Alavi & Dufner, 2005).

According to Vygotsky (1978), a child's zone of proximal development is the time when they are most receptive to learning, when they are just outside of their comfort zone, and when they can be guided to build their own knowledge through interactions with adults, peers, and subject matter (Lake, 2012). Because it promoted group work, Benbunan-Fich et al. (2005) thought constructivism provided the most useful theoretical framework for understanding online education. By postulating certain particular practices, Fosnot and Perry (2005) demonstrated how constructivism might be applied to the field of education. They hold the view that development itself is development, and not only the learning outcome, in constructivism. The last common practice put out by Fosnot and Perry (2005) is that community discourse promotes more thought (p. 34). Considering the above studies as well as the shortage of investigating the role of online interaction in Iranian EFL learners' buoyancy, the current study intends to fill the existing gap and investigates the relationship between Online Interactional Learning Model and Academic buoyancy of Iranian university students. In other words, this study is an attempt to illustrate how online interaction of the Iranian EFL students can be in relationship with their Academic buoyancy.

Background

Benbunan-Fich et al. (2005) used considered Fosnot and Perry (2005) to construct an input-process-output model of online learning. Features of courses, teachers, EFL students, and technology served as inputs. The processes included media richness, perceived social presence, a feeling of community, and individual and collaborative learning as well as unified interaction.

Figure 1 shows that all of the model's variables are dependent on one another, and that none of them has a dominating or overwhelming effect on the overall scheme. Instructional design,

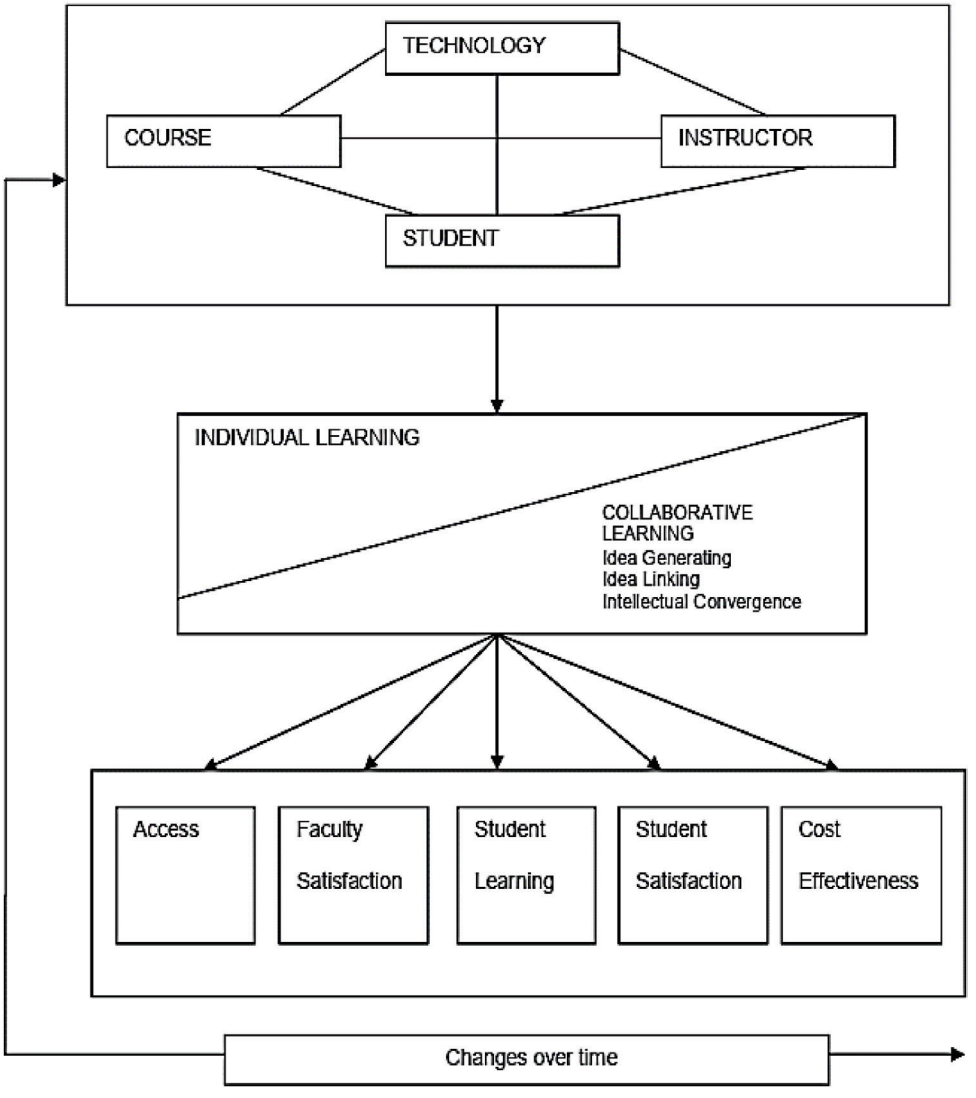

Figure 1. *Online interaction learning model*

pedagogies, student characteristics, technology, and subject matter all play a role in how students learn and the outcomes they achieve.

The key components of the online interaction-learning model have been the subject of a great deal of research, and these studies have identified a number of categories that are essential to any model of online interaction. Findings from the online interaction learning model by Endres et al. (2009) classify course materials, teacher effectiveness, and technological accessibility as its primary components. Ghaemi (2021) developed and validated a questionnaire to assess online interaction learning model, comprising these main categories, being in fact the first instrument, which was made and validated for EFL context.

However, research in the area of education particularly that which deals with the teaching and learning of English as a second or foreign language, can include the inevitable and ubiquitous academic challenges and setbacks that are inherent in all levels of education (Kaddoura &

Al Husseiny, 2021). To this end, it is crucial that students maintain academic buoyancy, which is described as the capacity to successfully manage such inherent difficulties as poor marks, exam stress, and workload (Martin & Marsh, 2008). "On the road to successful L2 learning, buoyancy gives students the ability to navigate the highs and lows of language acquisition and overcome daily challenges" (Yun et al., 2016, p. 98). This is why it's so critical for teachers and students to work together to identify what variables significantly contribute to kids' academic buoyancy and how to best foster it.

Research Questions

This study endeavors to find an answer to these research questions:

(1) Is there any significant relationship between Iranian EFL students' online interaction learning model and their buoyancy?
(2) Are there any significant relationships between all components of OILM and the whole buoyancy?
(3) Which OILM components are the significant predictors of buoyancy?

Literature Review

Educational Interaction

Finding an engaging and accurate explanation of educational interaction in the literature on education is a daunting task. The extensive use of this term in popular culture, which can mean everything from toasters to video games to vacation destinations, makes it even more difficult to pin down an exact meaning. Mutual occurrences requiring a minimum of two things and two acts were described by Wagner (2001) as interactions. According to the author, "reciprocal events requiring a minimum of two actions and two objects. Once these items and occurrences have an effect on each other in return, interactions take place" (p. 8). Various goals are pursued through interaction in educational settings. Learner control, "facilitating program adaptation based on learner input, allowing numerous forms of participation and communication, and helping meaningful learning" are among the functions listed by Sims (1999, p. 17). In addition, the learning communities advocated for by prominent educational philosophers such as Wenger et al. (2002), and others who highlight the importance of community in learning cannot be realized without interaction. To conclude, in constructivist learning theories and in encouraging students to be attentive to their mindfulness (Visser, 2000), the importance of another person's perspective, typically gained through interaction, is a crucial component of learning.

Distance education has traditionally placed a premium on student-teacher communication. The power of one-on-one interaction between a student and an instructor was held by Holmberg (1981). In addition, Holmberg popularized the terms "simulated interaction" and "guided didactic interaction" to describe a type of writing that works well with autonomous models of online learning. According to Esposito (2003), online interaction is a crucial component of the educational process. It occurs when students of English as a foreign language (EFL) take information that has been passively transmitted to them and transform it into knowledge that has specific, unique value.

To back up and even explain education, there is a long history of research and recognition of the critical importance of interaction. Additionally, Dhawan (2020) acknowledged the significant significance of interaction in education by saying that in an interactive learning scenario, students participate in live lectures, engage with the lectures in real-time, and receive

immediate feedback. A multitude of interaction modalities are laid up by the internet. There has been an improvement in practically every type of mediated academic interaction. Assuming they are all compatible, one can enhance classroom instruction by utilizing web applications. The three most prevalent forms of interaction in online learning environments, as identified by Christenson and Menzel (1998), are "student-student; student-teacher and student-content" (p. 18). Teachers' relationships with one another, with course material, and with course material itself were expanded upon by Anderson et al. (2001). Figure 2 shows six different kinds of interactions in schooling.

Text was used to construct early types of distance education, and mail services were used to provide delayed forms of asynchronous communications. In comparison to other media, the internet today provides almost constant access to an unprecedented quantity of material.

Everyone can see that the internet offers a huge opportunity for education, one that includes almost every style and method of delivery. The interaction between and among various stakeholders is also clearly the most notable feature of formal schooling. Since "costs, content, learning objectives, convenience, technology used, and time availability" are all variables, it follows that many types of student interaction can be substituted for one another (Anderson, 2008, p. 67). If even just one of the three types of interaction is very high-quality, then a great deal of meaningful and contemplative learning can take place (Anderson et al., 2001). Teachers and course designers in online settings face the challenge of creating a learning environment that is simultaneously focused on the learner, the content, the community, and the assessment.

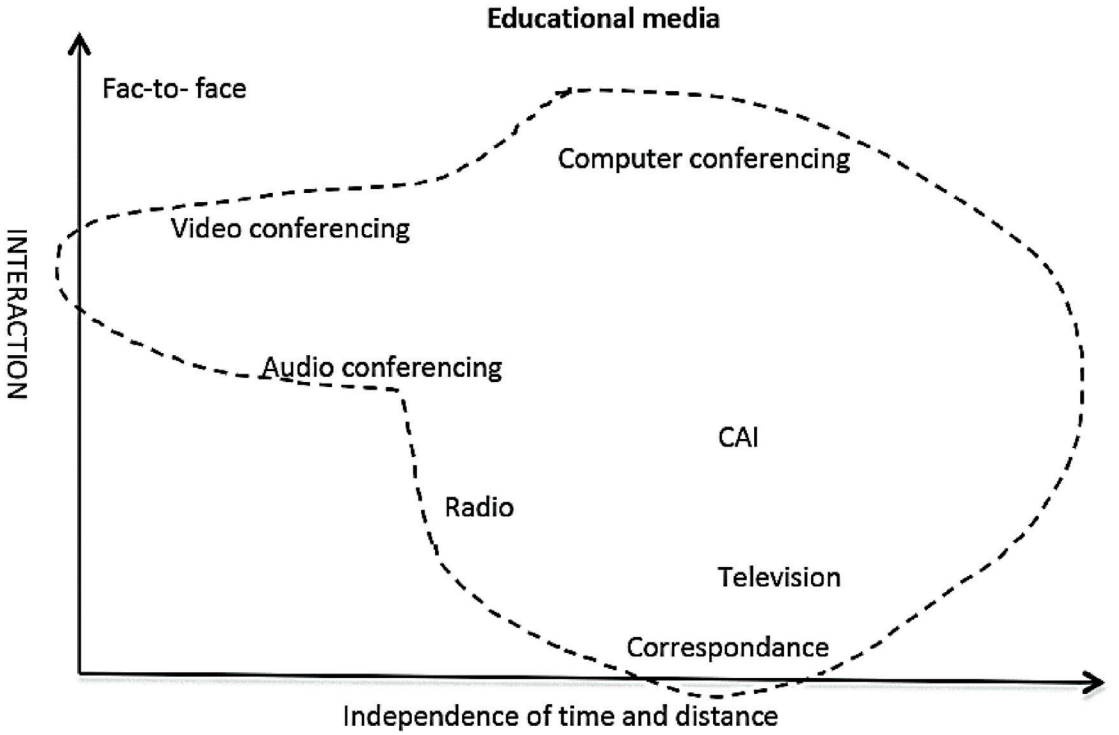

Figure 2. *Types of educational interaction*
Adapted from Ghaemi (2021)

Online Interaction

According to Berge (2002), the methods and systems that are currently in use should be considered while defining interaction. As stated by Hirumi (2002), there are three tiers of interaction: "the interaction of the learner with himself (level 1), the interaction of the learner with human and the interaction of learners with non-human resources in the learning environment (level 2)". Interaction between the learner and the e-learning system is defined at the third level of interaction, which is a meta-level. Human interaction, both between EFL students and their teachers, and "but also of the interaction of EFL students with the content and interface of the learning environment" make up the second level (Hirumi, 2002, p. 21). Although the second level of interaction is more obvious because it is linked to the most obvious aspects of online learning (assuming there is interaction at all), the third level is equally important because it is often disregarded when transitioning from traditional to online instruction (Berge, 2002).

According to Deng (2022), online interaction plays an important role in educational settings and provides five characteristics: openness, extendibility, flexibility, intermediation and manageability. In other words, online interaction gives equal opportunity to all learners, provides technological educational resources, does not limit the learners with time and location, injects a wide range of educational activities and helps the instructors have a more appropriate classroom management.

Liu and Wang (2004) believed that online education, which has been made feasible by technological developments, provides learning opportunities globally. In this regard, the leading goal of online learning is to boost up students' cognitive skills hence, students are required to partake vigorously to accomplish operative learning results (Liu & Wang, 2024). The importance of interaction in improving language acquisition, particularly online language learning, has been extensively recognized by Wang et al. (2024) and others (Wang et al., 2024). In a similar vein, other unconventional contexts have recognized the significance of interaction, such as social networks in SLA while studying abroad, computer-assisted language learning, and AI-enhanced communication.

Particularly pertinent to second language (L2) education is classroom interactional competency (CIC), defined as "the capacity of educators and students to use interaction as a tool for promoting and supporting learning" (Wang, 2023). CIC can analyze the usage of interactional resources in task completion while also engaging all learners in the learning environment. Students are encouraged to take risks and enhance their learning through CIC-facilitated dialogic, engaged, and safe classrooms (Wang et al., 2024). Educators and students alike can benefit from fostering this competency since it opens doors to more learning opportunities.

There is a plethora of criteria that can be used to categorize interactions in online language learning environments. There are two main types of interactions: asymmetrical (such as a teacher-led lecture) and symmetrical (such as two-way communication with student engagement). Secondly, the mode of the interaction determines whether it is synchronous or asynchronous. The last way things are classified is by whether the interaction is instructive or social in nature. In their study on interaction in distant learning, Liu and Wang (2024) distinguished between three commonly used types of interaction based on the agents involved: student-instructor, student-student, and student-content.

According to Wang et al. (2023), it is crucial for virtual language classrooms to promote student-content, student-instructor, and student-student interaction. Compared to student-student and student-content interactions combined, as well as student-instructor plus student-instructor interaction, student-instructor plus student-content interactions has a greater impact on students' achievement than either of these factors alone (Wu et al., 2024). In order

to create communities of practice, both student-student and student-instructor interaction are crucial. It can also help to boost students' motivation and happiness. Research has shown that, in terms of interaction quality, online interactions exhibit characteristics similar to those in person, including the generation of constructive criticism (Liu & Wang, 2024).

Empirical Studies on the Concept of Buoyancy

A number of research (e.g., Martin & Marsh, 2008, 2009; Martin et al., 2010; Martin, 2014) attempted to delve into the nature of buoyancy. An investigation into the characteristics of academic buoyancy among Irish secondary school students. Additionally, it has investigated if buoyancy is a substantial predictor of remaining in school or dropping out early. In accordance with the goals outlined for this study, a mixed-method technique was employed. The findings show that optimistic pupils can clearly compare and contrast their personal experiences with those of others. Among these students' traits were assurance, command, organization, independence, and tenacity. The researcher came up with the Student Buoyancy Instrument (SBI) based on these buoyancy traits. The SBI questionnaire was given to 581 students from 17 secondary schools in Ireland, and it gave them the opportunity to think on their buoyancy. The created survey failed to meet the criteria for validity and reliability. Moreover, individuals with the lowest likelihood of dropping out had the best scores on the confidence, planning, and persistence measures (Comerford et al., 2015).

In a separate study, 598 students in Years 8 and 10 from five different Australian high schools were surveyed twice throughout the school year—once in the middle and again at the end—to gauge their academic buoyancy (Comerford et al., 2015). Participants rated their academic buoyancy in relation to a number of hypothesized factors, including anxiety, self-efficacy, control, the teacher-student connection, and mathematical academic engagement, as part of the data collection technique. The findings showed that academic buoyancy in Time 1 is adversely and strongly predicted by Time 1 anxiety, self-efficacy, and academic engagement. Besides academic buoyancy at Time 1, other factors that were discovered to adversely explain the variance in Time 2 academic buoyancy included anxiety, self-efficacy, academic engagement, and the teacher-student connection. In conclusion, a great deal of variation in academic buoyancy was associated with anxiety, the most significant predictor (Martin & Marsh, 2008). An additional research endeavored to probe and analyze the buoyancy profiles of 879 South Korean college students. Six factors were identified as predictors of buoyancy in the study by Yun et al. (2016): the teacher-student relationship, second language self-efficacy, self-regulation, ideal second language self, second language learning persistence, and learning anxiety.

Additionally, research has shown that academic buoyancy affects a variety of psychological and educational outcomes (Martin & Marsh, 2006; Martin et al., 2010). In educational contexts where the influence of academic buoyancy at Time 1 on anxiety at Time 2 was apparent, the findings of the longitudinal study by Martin and Marsh (2008) also projected the predictive and explanatory powers of academic buoyancy. According to Martin and Marsh (2006), academic buoyancy has a predictive effect on students' overall self-esteem, their enjoyment of school, and their participation in class. This is related to how another study (Sumrah, 2023) explained how academic buoyancy protects against examination appraisal as a danger by influencing self-regulatory processes and allowing for improved performance on examinations. There was a negative feedback loop between worry and academic buoyancy as well. High levels of academic buoyancy may be associated with increased drive and confidence, according to research (Putwain et al., 2015). Finding the connection between academic buoyancy and students' achievement was the goal of another study as well. According to research by Yun et al. (2018), students' levels of buoyancy are strong predictors of their academic performance.

To assess buoyancy and provide some metric for this issue, some scholars have developed the relevant questionnaires. A total of 39 things drawn from the International Personality Item Pool make up the SBI. (Golberg et al., 2006) measuring individuals' personality traits. Target of this questionnaire was 12-year-old children. To measure buoyancy, another instrument was designed by Martin and Marsh (2008) targeting mathematics classes. In this regard, the questionnaire developed by Jahedizadeh et al. (2019) is the one appropriate for higher education students focusing on EFL students' academic buoyancy.

Considering the above studies, the current study intends to fill the existing gap and investigates the relationship between Online Interactional Learning Model and Academic buoyancy of Iranian university students. In other words, this study is an attempt to illustrate how online interaction of the Iranian EFL students can be in relationship with their Academic buoyancy.

Materials and Methods

Research Design

The purpose of this research was to look at how buoyancy relates to the online interaction learning paradigm used by Iranian EFL students. In other words, it tried to reveal the extent to which applying an online interaction model could raise the Iranian EFL learners' ability in dealing with their every-day educational challenges. Thus, it employed a correlational design to fulfill this purpose. Furthermore, the current study focused on the relationship among all components of online interaction learning model and all components of academic buoyancy utilizing structural equation model.

Participants

Purposive sampling was used to pick 240 undergraduate English majors from Bahar Institute of Higher Education in Mashhad, Iran. The participants were 86 sophomore (35.8%), 88 junior (36.7%), and 66 senior (27.5%) students. Among these participants, 102 students (42.5%) and 138 of them (57.5%) were majoring in English Translation and Teaching English respectively including 57 (23.8%) male and 183 (76.3%) female students.

Instruments

Online Interaction Learning Model Questionnaire

The online interaction learning model questionnaire, created by Ghaemi (2021), was utilized to evaluate the participants' online interaction learning model. The Online Interaction Learning Model's five dimensions—Course materials, Instructor performance, learning methods, Student-to-student interaction, and Access to technology—were carefully considered when developing the 35-item questionnaire. For example, "The system makes it easy for you to discuss questions with other EFL learners" (student-to-student interaction), "The instructor for this course helped me to revise my thinking in a way that helped me to learn" (instructors' performance), "I could easily transfer what I learned in the online class to my real life" (learning practices), "Online learning activities were relevant" (course materials), and "Availability of supplemental online academic support was useful" (access to technology). Each item is asked to be answered on a five-point scale, with 1 representing strong agreement and 5 meaning strongly disagree. The instrument's reliability index is 0.91, which is rather high.

Academic Buoyancy Questionnaire

A newly developed questionnaire by Jahedizadeh et al. (2019) was utilized to evaluate L2 buoyancy. Sustainable (seven things), regularity adaptable (four items), personally eligible (eight

items), and academically accepting (eight items) are the four components of second language buoyancy that make up the 27-item test. A score of 1 ("definitely disagree") and 5 ("definitely agree") indicates the level of agreement with each statement. In order for language acquisition to be sustainable, students must be able to triumph over challenges such as low scores, negative comments from teachers, heavy workloads, and failure. Setting goals for language learning, such as consistently planning ahead, being clear about why you're learning, and tailoring those goals to your own values and study habits, is the focus of regularity adaptation. Another part of L2 buoyancy is positive personal eligibility, which involves positive perceptions of one's own competencies, such as being able to handle multiple tasks at once, believing in one's abilities, being a trustworthy student, having pride in learning the language, being independent and not relying on others to complete learning tasks, being persistent in language learning, and having a positive outlook on life in general.

The questionnaire was determined to have an estimated reliability of 0.83 using Cronbach's α. According to their research, all of the acceptable fit criteria were met, including the $\chi 2$ value (1,982.64), the $\chi 2/df$ ratio (718.23), and the RMSEA (0.062). Both the GFI and the NFI were just below the cutoffs, coming in at 0.68 and 0.80, respectively.

The Procedure of Data Collection

A total of 258 students from Bahar Institute of Higher Education were given the Online Interactional Learning Model and Buoyancy surveys; 240 students (86 sophomores, 88 juniors, and 66 seniors) returned the surveys with all the necessary information. Both questionnaires were on a single PDF file so that the researcher could accurately distinguish the two corresponding questionnaires for each participant for further statistical analyses. The participants were provided with the questionnaires through their WhatsApp Groups. During the Corona Virus Period, all of the classes were required to create a WhatsApp Group through which the students and the lectures were in contact to share the essential content and materials. The researchers were able to glean not just the participants' specialized knowledge, but also their gender, academic year, and major (e.g., if they were studying English as a Second Language or Translation). The descriptive statistics need this data.

Quantitative Analysis

Results

Test of Normality

For the aim of utilizing parametric tests in the statistical analyses, we performed the Skewedness and Kurtosis Test of normalcy to assess the data acquired from the participants' replies to the OILM and Buoyancy questionnaires.

The collected data for both OILM and Buoyancy are normal and fairly symmetrical due to the result showing the Skewedness for both between –0.5 and +0.5. As for the Kurtosis results, the values are between –1 and +1 indicting that the distribution is not very flat.

The normality test results for the variable "OILM" included a sample size of 240. The skewness statistic was 0.106 with a standard error of 0.157, indicating a slight positive skew. The kurtosis statistic for OILM was –0.649, with a standard error of 0.313, suggesting that the distribution is slightly platykurtic.

For the variable "Buoyancy," the sample size was also 240. The skewness statistic was –0.004 with a standard error of 0.157, indicating a nearly symmetrical distribution. The kurtosis statistic for Buoyancy was –0.125, with a standard error of 0.313, which similarly indicates a distribution that is close to normal but slightly platykurtic. The valid number of observations for both variables was 240 when analyzed using a listwise approach.

The results of the One-Sample Kolmogorov-Smirnov Test for the variables "OILM" and "Buoyancy" are presented as follows. For both variables, the sample size (N) was 240.The mean for OILM was 3.7813, with a standard deviation of 0.15279. For Buoyancy, the mean was 4.1532, and the standard deviation was 0.15374. The most extreme differences were assessed, revealing an absolute difference of 0.045 for OILM and 0.022 for Buoyancy. The positive differences were both 0.045 for OILM and 0.022 for Buoyancy, while the negative differences were –0.037 and –0.018, respectively. The test statistic for OILM was 0.045, and for Buoyancy, it was 0.022. The asymptotic significance (2-tailed) for both variables was 0.200, indicating no significant deviation from normality.

Descriptive Statistics

The demographic information of the participants is summarized as follows. Among the 240 participants, 57 were male, representing 23.8% of the sample, while 183 were female, accounting for 76.3%.In terms of year of study, there were 86 sophomores (35.8%), 88 juniors (36.7%), and 66 seniors (27.5%). The participants' majors were divided into two categories: teaching and translation. A total of 138 participants (57.5%) were majoring in teaching, while 102 (42.5%) were majoring in translation. The results of the descriptive statistics for the participants' scores on OILM and Buoyancy are as follows. Both variables had a valid sample size of 240, with no missing data.

For OILM, the mean score was 3.7813, with a standard deviation of 0.15279. In contrast, the mean score for Buoyancy was higher, at 4.1532, with a standard deviation of 0.15374. These statistics provide insight into the central tendency and variability of the participants' scores for both measures. The descriptive statistics for the components of the participants' OILM scores are detailed below. All five components had a valid sample size of 240, with no missing data.

The mean score for "Course Material" was 3.5551, accompanied by a standard deviation of 0.19909. For "Instructor Performance," the mean was notably higher at 4.0575, with a standard deviation of 0.14509.

"Learning Practice" had a mean score of 3.5435 and a standard deviation of 0.16227, while "Student-to-Student Interaction" scored a mean of 3.6308, with a standard deviation of 0.16634. Lastly, "Access to Technology" had the highest mean score among the components at 4.1196, with a standard deviation of 0.14609. These statistics provide a comprehensive overview of the participants' perceptions regarding each component of OILM.

The descriptive statistics for the components of the participants' Buoyancy scores are presented as follows. All four components had a valid sample size of 240, with no missing data.

For "Sustainability," the mean score was 4.4791, with a standard deviation of 0.18088, indicating a strong positive perception. The component "Regularity Adaptation" had a mean of 3.6394 and a standard deviation of 0.17688.

The mean score for "Positive Personal Eligibility" was 4.3621, with a standard deviation of 0.19236, reflecting a favorable view among participants. Finally, "Positive Acceptance of Academic Life" recorded a mean score of 4.1321 and a standard deviation of 0.15378. These statistics highlight the participants' overall perceptions of each Buoyancy component.

The second primary variable, buoyancy, is comprised of four parts. The most important of these parts is sustainability, with favorable personal eligibility and acceptance of academic life coming in marginally second and third, respectively. Regularity adaptability had the lowest mean, indicating that individuals were reluctant to comply with rules and regulations.

Inferential Statistics

Finding a connection between students' buoyancy and their online interaction was the goal of the present study. Put another way, the goal was to find out if students' online interactions

could assist them in overcoming academic setbacks and difficulties. Students' capacity to deliberately cope with obstacles on their educational journey was bolstered through online interaction, which was the subject of the present study. In this regard, the relationship between all 5 components of the Online Interaction Learning Model Questionnaire (Ghaemi, 2021) and all 4 components of the Academic Buoyancy Questionnaire (Jahedizadeh et al., 2019) was examined in order to project how they are related and which components or characteristics could create a stronger relationship.

Following the goals of the study and in order to address the first research question, we used Pearson Correlation to determine the strength of the association between OILM and buoyancy. The results revealed that there was a very strong and statistically significant correlation (sig = 0.000, r = 0.931) between the two variables.

The results of the correlation analysis between OILM and Buoyancy are as follows. The Pearson correlation coefficient was found to be 0.931, indicating a very strong positive correlation between the two variables. The significance level for this correlation was 0.000, suggesting that the relationship is statistically significant. Both variables were based on a valid sample size of 240 participants, reinforcing the robustness of this correlation result.

Canonical Correlation Analysis (CCA)

The five OILM components and the four buoyancy components can have their multivariate correlations examined using CCA.

A significant amount of the common variance between the OILM components and buoyancy may be explained by the first canonical correlation ($Rc = 0.75$, $p < 0.001$). The squared canonical correlation ($Rc^2 = 0.5625$) suggests that 56.25% of the variance in buoyancy is accounted for by the OILM components. All four canonical functions are statistically significant, suggesting a multidimensional relationship between the components of OILM and buoyancy.

When it comes to OILM's impact on 'Sustainability' and 'Positive Acceptance of Academic Life' in buoyancy, the first canonical function shows that 'Instructor performance' (loading = 0.85) and 'Course materials' (loading = 0.72) shine the brightest. This suggests that the best way to help students become more resilient and adaptable in their studies is to improve the quality of their instructors and the content of their courses.

The Results of Structural Equation Model

Using the Structural Equation Model (SEM), it was found that the model fit the data, with RMSEA = 0.086, GFI = 0.87, AGFI = 0.79, and TLI = 0.87, indicating that the model represents the link between all components of OILM and buoyancy.

As shown in Figure 3 to answer the second research question, all routes are direct and significant indicating the significance of coefficients as well as the relationships. The following

Table 1. *Canonical correlation results*

Canonical Function	Canonical Correlation (Rc)	Wilks' Lambda	Chi-Square	df	p-value
1	0.75	0.45	231.48	20	< 0.001
2	0.62	0.62	162.77	12	< 0.001
3	0.43	0.81	87.65	6	< 0.01
4	0.25	0.94	35.21	2	< 0.05

Table 2. *Canonical loadings*

OILM Components	Canonical Loading (1)	Canonical Loading (2)
Course materials	0.72	0.48
Instructor performance	0.85	0.42
Learning Practices	0.68	0.51
Student-to-Student Interaction	0.59	0.38
Access to Technology	0.65	0.44
Buoyancy Components	**Canonical Loading (1)**	**Canonical Loading (2)**
Sustainability	0.78	0.35
Regularity adaptation	0.65	0.48
Positive personal eligibility	0.71	0.44
Positive acceptance of academic Life	0.73	0.51

figure projects that the 30 routes generally visualize a significant relationship between OILM and Buoyancy. Except for the relationship between PPE and LP ($p > 0.05$), all of the other components reveal a significant relationship.

To provide clarity, the abbreviations used in Figure 3 are explained. The abbreviation "X1" corresponds to OILM, while "X2" refers to Buoyancy. The specific components of OILM are as follows: "CM" stands for Course Material, "IP" for Instructor Performance, "LP" for Learning Practice, "SSI" for Student-to-Student Interaction, and "AT" for Access to Technology.

For Buoyancy, the components are denoted by "SUS" for Sustainability, "RAD" for Regularity Adaptation, "PPE" for Positive Personal Eligibility, and "PAAL" for Positive Acceptance of Academic Life.

As also shown in Table 3, route 13 is not significant. Routes 8 and 26 are significant at confidence level of 0.05 and the other routes are significant at confidence level of 0.01.

The Results of Regression Analysis

In order to discover the best predictor of Buoyancy among all components of OILM and answer the third research question, linear regression analysis was conducted. According to the results, all OILM components sustain a significant and strong relationship with buoyancy since all of them hold sig = 0.000. Furthermore, all components showed a correlation coefficient of above 0.7 indicating a strong relationship.

The results of the correlation analysis between all components of OILM and Buoyancy are summarized below. Each component was assessed against Buoyancy using Pearson correlation coefficients, with a valid sample size of 240 participants.

1. **Course Material** exhibited a Pearson correlation of 0.929 with Buoyancy, which is highly significant ($p < 0.000$).
2. **Instructor Performance** showed an even stronger correlation, with a coefficient of 0.943, also significant ($p < 0.000$).

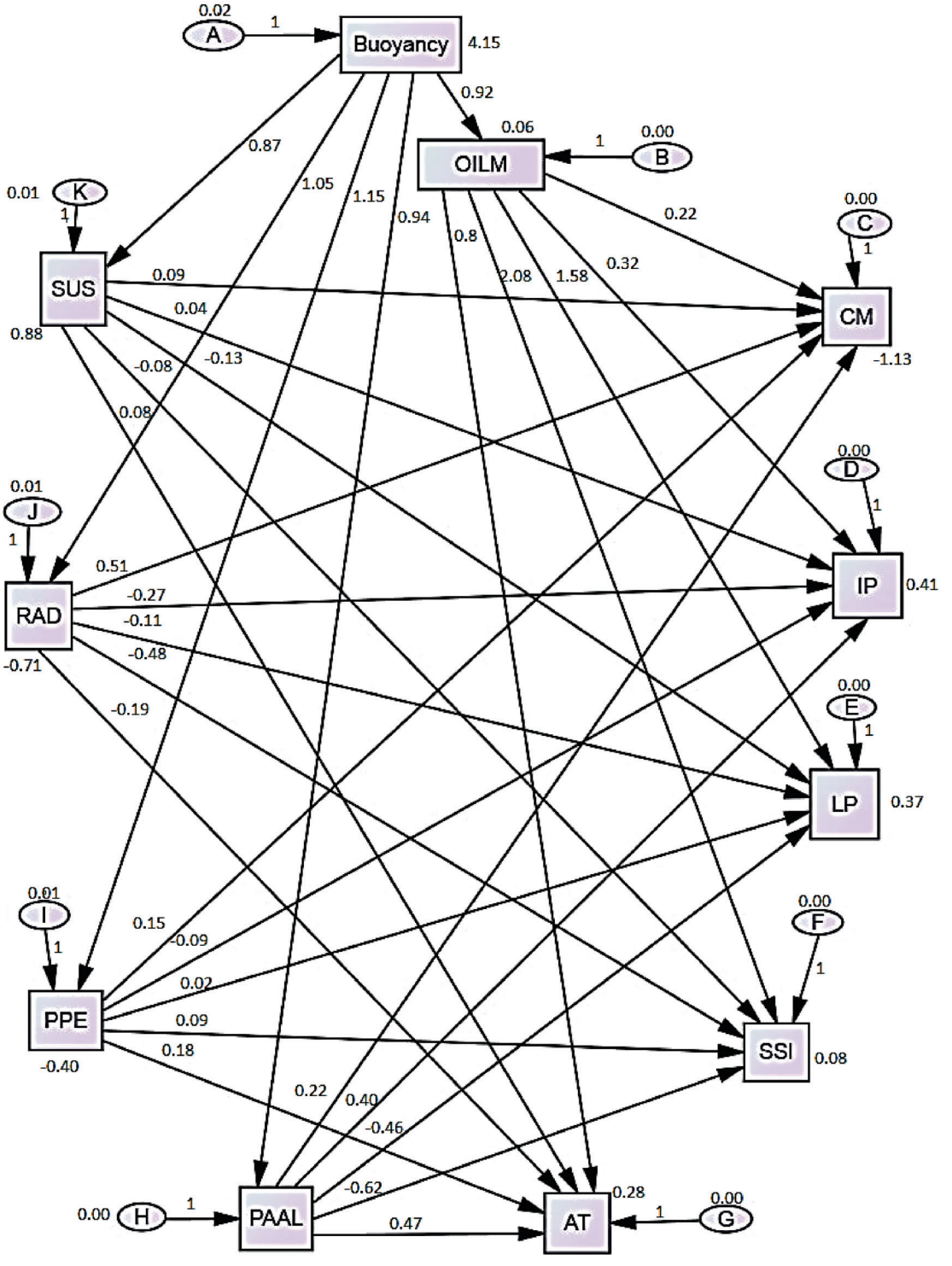

Figure 3. *Structural equation modeling for all components of OILM and Buoyancy*

Table 3. *Results of route analyses among all components of the two variables*

	Independent	Dependent	Estimate	S.E.	C.R.	P
par_12	Buoyancy	OILM	.519	.410	252191	***
par_11	Buoyancy	SUS	.988	.491	282920	***
par_12	Buoyancy	RAD	22401	.422	202419	***
par_10	Buoyancy	PPE	22201	.421	292291	***
par_19	Buoyancy	PAAL	.504	.411	012922	***
par_2	SUS	CM	.451	.418	22095	***
par_1	SUS	IP	.401	.422	22540	***
par_2	SUS	LP	–.221	.410	–92002	***
par_0	SUS	SSI	–.411	.420	–92290	***
par_9	SUS	AT	.419	.425	02489	***
par_8	RAD	CM	.924	.484	92099	***
par_1	RAD	IP	.112	.410	222292	***
par_9	RAD	LP	–.222	.499	–12401	.141
par_5	RAD	SSI	–.090	.422	–202948	***
par_24	RAD	AT	–.298	.401	–02021	***
par_22	PPE	CM	.290	.401	22110	.111
par_21	PPE	IP	–.454	.425	–02811	***
par_22	PPE	LP	.419	.402	.910	.655
par_20	PPE	SSI	.495	.418	22011	***
par_29	PPE	AT	–.215	.422	–92029	***
par_28	PAAL	CM	.129	.491	12801	.110
par_21	PAAL	IP	.255	.420	222529	***
par_29	PAAL	LP	–.084	.418	–82498	***
par_25	PAAL	SSI	–.819	.409	–222522	***
par_14	PAAL	AT	.081	.499	92458	***
par_18	OILM	CM	.110	.242	12211	.131
par_11	OILM	IP	.225	.401	12849	***
par_19	OILM	LP	22919	.459	282842	***
par_15	OILM	SSI	12418	.498	282514	***
par_24	OILM	AT	.941	.411	222450	***

3. **Learning Practice** had a Pearson correlation of 0.779 with Buoyancy, indicating a strong positive relationship ($p < 0.000$).
4. **Student-to-Student Interaction** displayed a correlation of 0.796, which is significant ($p < 0.000$).
5. **Access to Technology** had a correlation of 0.891, indicating a strong positive relationship with Buoyancy, again with statistical significance ($p < 0.000$).

Overall, all components of OILM demonstrated strong positive correlations with Buoyancy, highlighting the interconnectedness of these variables.

Furthermore, the NAOVA analysis results shed light on the significance of the linear regression since sig equals $0.000 < 0.05$.

As a further proof, adjusted R Square = 0.916 indicates that 91.6 % of buoyancy can be predicted using the components of OILM: *access to technology, Learning practice, Course material, student to student interaction, Instructor performance*.

The regression analysis model summary results are as follows. The standard error of the estimate is 0.04457, indicating the average distance that the observed values fall from the regression line.

The correlation coefficient (R) is 0.958, suggesting a very strong relationship between the independent and dependent variables in the model. The R Square value is 0.918, meaning that approximately 91.8% of the variance in the dependent variable can be explained by the independent variable(s). The adjusted R Square value is 0.916, which provides a more accurate measure of the explanatory power of the model, accounting for the number of predictors used. Overall, these results indicate a highly effective regression model.

It was also illustrated that that the components *course material* and *instructor performance* show that sig= 0.000 indicating they are the most significant and best predictors of buoyancy.

For the regression analysis, the unstandardized coefficients show that the constant is 0.592, with a standard error of 0.099, and is statistically significant ($p < 0.000$).

For the predictors:

- **Course Material** has an unstandardized coefficient of 0.294 (Std. Error: 0.037) and a standardized coefficient (Beta) of 0.380, indicating a strong positive impact on the dependent variable, with significance ($p < 0.000$).
- **Instructor Performance** shows a coefficient of 0.755 (Std. Error: 0.121) and a Beta of 0.712, also significant ($p < 0.000$).
- **Learning Practice** has a coefficient of –0.035 (Std. Error: 0.089) and is not significant ($p = 0.698$).

Table 4. *Results of ANOVA Analysis for the relationship between all Components of OILM and Buoyancy*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.184	5	1.037	521.939	.000[b]
	Residual	.465	234	.002		
	Total	5.649	239			

a. Dependent Variable: BUOYANCY

b. Predictors: (Constant), access to technology, Learning practice, Course material, student to student interaction, Instructor performance

- **Student-to-Student Interaction** reports a coefficient of 0.069 (Std. Error: 0.090), also not significant (p = 0.443).
- **Access to Technology** presents a coefficient of –0.163 (Std. Error: 0.099) and is marginally significant (p = 0.102).

Overall, Course Material and Instructor Performance are strong predictors, while Learning Practice, Student-to-Student Interaction, and Access to Technology do not significantly impact the dependent variable.

Discussion

All students encounter unique online obstacles at universities, which might hinder their academic performance or even cause them to drop out (Clark, 2005; Martin & Marsh, 2006, 2008, 2009). The experiments may appear to be common to all students, and students' experiences may be similar. Students' reactions to the same scenario, however, can vary greatly. Research conducted by Schmitt et al. (2009) and Martin (2006) has established a connection between academic buoyancy and the online interaction learning paradigm. Nevertheless, according to Martin (2006), there is a missed chance to improve students' academic buoyancy because current research on online interaction models does not adequately address the importance of students' buoyancy in online contexts.

Students need buoyancy, a form of ordinary resilience, to successfully handle the everyday problems that are recognized to be integral in academic contexts (Choi & Chung, 2021). In particular, students need a lot of academic buoyancy while they're in classrooms where they have to know how to overcome the typical obstacles and problems of college life (Martin & Marsh, 2008). Failure to appropriately respond and persist in the face of adversity leads to incapacitating special effects such low academic performance, excessive stress levels, and student dropout. Squat online interactions have been a topic of international controversy; better understanding of student motivations should help improve them (Clark, 2005; Martin 2006).

The purpose of this research was to examine the connection between higher education academic buoyancy and students' online interaction learning models. All five parts of the online interaction learning model—course content, instructor performance, learning practice, student-to-student interaction, and access to technology—were strongly correlated with the four parts of academic buoyancy: sustainability, regularity adaptation, positive personal eligibility, and acceptance of academic life. A sample of Iranian university students were given the buoyancy questionnaire to help achieve the goals of the present research. According to the findings, the two factors in this study were highly related to one another. So, students' levels of online learning interaction will also improve if they develop good thoughts about their buoyancy. Academic buoyancy is the strongest single predictor of online interaction propensity among college students, according to previous research (e.g., Anthony & Artino, 2012; Martin & Marsh, 2008; Miller et al., 2013; Robbins et al., 2004).

Predictors of buoyancy are the subject of another discovery. The most important and accurate predictor of buoyancy is the combination of course material and instructor performance. While the two contexts for language acquisition are distinct, the responsibilities of instructors and students, as well as the methods and resources used in instruction, are identical (Jahedizadeh et al., 2015). By uplifting kids, we can increase their chances of future success, high academic achievement, and an increased propensity for online interaction, according to the present study's theoretical and pedagogical implications. This can be seen in higher education administrators, faculty, students, and even those who develop textbooks and academic specialists. Students' self-awareness of buoyancy and their views of their talents in online interaction

environments, taken together, can help them negotiate the vicissitudes of language learning (Bandura, 1997).

School authorities are highly recommended to remove any boundaries and obstacles to online education. Paakkari and George (2018) believed that the expansion of online interaction learning necessitates matching the students' viewpoints with organizational buoyancy and highlighting it (Brach, 2017). Consequently, in order to be successful, school managers should remove the impediments to online education in schools and develop a friendly — online context. By indorsing such settings, buoyancy was enhanced in the process. Based on the research findings, it is proposed that 91.6% of buoyancy can be predicted using the components of OILM: access to technology, Learning practice, Course material, student-to-student interaction, Instructor performance. In addition, course material and instructor performance were the most significant and best predictors of buoyancy, hence a greater attention ought to be attached to them. It seems that the promotion of online interaction learning has increased their capability in their studies, hence their efficiency.

Implications

For teachers and curriculum developers curious about online interaction learning, the results of this study have important implications. This study suggests that appropriate application of technological tools, software and digital learning by educators can help the learners tackle academic challenges and failures properly. With that said, this study also speaks to the importance of promoting online education settings at schools and universities.

Students' accomplishment, motivation, test scores, classroom satisfaction, and self-esteem are just a few of the ways academic buoyancy impacts the teaching-learning cycle in practice. In addition, curriculum designers should develop courses focusing on online interaction of learners and use of technology to nourish learners who can deal with the typical academic challenges easily. In this way, learners' variables like achievement, motivation, test performance, classroom enjoyment, self-esteem can be augmented. Developing tasks in a way that can help the combination of online interaction can lead to buoyant learners and bring about opportunities to foster sustainability. As an actionable strategy, interactive whiteboards that are internet-connected can be of high significance. This manner, the teachers can access a wealth of information and tools on the web.

For future research, studies can focus on investigating the implementation of various actionable strategies such as interactive whiteboards that are internet connected as well as other strategies. They can compare the effects of each strategy on the learners' buoyancy.

References

Alavi, M., & Dufner, D. (2005). Technology mediated collaborative learning: A research perspective. In Hiltz, S. R. & Goldman, R. (Eds.), *Learning together online: Research on asynchronous learning networks* (pp. 191–213). Lawrence Erlbaum Associates.

Anderson, T. (2008). *Theory and practice of online learning*. Athabasca University Press.

Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, *5*(2), 1–17. https://doi.org/10.24059/olj.v5i2.1875

Anthony, R., & Artino, J.R. (2012). Academic self-efficacy: from educational theory to instructional practice. *Perspectives on Medical Education*, *1*(2), 76–85. https://doi.org/ 10.1007/s40037-012-0012-5

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.

Benbunan-Fich, R., Hiltz, S. R., & Harasim, L. (2005). The online interaction learning model: An integrated theoretical framework for learning networks. In S. R. Hiltz & R. Goldman (Eds.), *Learning together online: Research on asynchronous learning networks* (pp. 1937). Lawrence Erlbaum Associates

Berge Z. (2002). Active, interactive and reflective eLearning. *The Quarterly Review of Distance Education*, *3*(3), 181–190.

Brach C. (2017). The journey to become a health literate organization: A snapshot of health system improvement. *Studies in Health Technology and Informatics*, *240*, 203–237.

Choi, L., & Chung, S. (2021). Navigating online language teaching in uncertain times: Challenges and strategies of EFL educators in creating a sustainable technology-mediated language learning environment. *Sustainability*, *13*, 7664. https://doi.org/10.3390/su13147664

Christenson, L., & Menzel, K. (1998). The linear relationship between student reports of teacher immediacy behaviors and perceptions of state motivation, and of cognitive, affective, and behavioral learning. *Communication Education, 47*, 82–90. https://doi.org/10.1080/03634529809379112

Clark, M. R. (2005). Negotiating the freshman year: Challenges and strategies among first-year university students. *Journal of University Student Development*, *46*(3), 296–316. https://doi.org/10.1353/csd.2005.0022

Comerford, J., Batteson, T. & Tormey, R. (2015). Academic buoyancy in second level schools: Insights from Ireland. *Procedia – Social and Behavioral Sciences*, *197*, 98–103.

Deng, Q. (2022). A research on online education behavior and strategy in university. *Front Psychology*. https://doi.org/10.3389/fpsyg.2022.767925, 1692

Dhawan, S. (2020). Online learning: A panacea in the time of covid-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Duckworth, A. L. (2016). *Grit: The Power of Passion and Perseverance*. Simon and Schuster.

Endres, M. L., Chowdhury, S., Frye, C. & Hurtubis, C. A. (2009). The multifaceted nature of online MBA student satisfaction and impacts on behavioral intentions. *Journal of Education for Business*, *84*(5), 304–312. https://doi.org/10.3200/JOEB.84.5.304-312

Esposito, J. (2003). The processed book. *First Monday*, *8*(3).

Finn, J. D. & Rock, D. A. (1997). Academic success among students at risk for school failure, *Journal of Applied Psychology*, *82*(2), 221–234. https://doi.org/10.1037/0021-9010.82.2.221

Ghaemi, H. (2021). Designing and validating a comprehensive questionnaire to assess online interaction learning Model. *International Journal of Language Testing*, *11*(2), 34–50. https://doi.org/10.18517/ijaseit.6.3.732

Hirumi, A., 2002. A framework for analyzing, designing and sequencing planned eLearning interactions. *The Quarterly Review of Distance Education*. *3*(2), 141–160.

Holmberg, B. (1981). *Theory and practice of distance education*. Routledge.

Jahedizadeh, S., Ghonsooly, B., Ghanizadeh, A. & Akbari, O. (2015). A cross-contextual analysis of EFL learners' perceptions of classroom activities, *Journal of Applied Linguistics and Language Research*, *2*(4), 322–336. https://doi.org/10.5861/ijrse.2015.1032

Jahedizadeh, S., Ghonsooly, B., & Ghanizadeh, A. (2019). Academic buoyancy in higher education: Developing sustainability in language learning through encouraging buoyant EFL students. *Journal of Applied Research in Higher Education, 11*(2), 162–177. https://doi.org/10.1108/JARHE-04-2018-0067

Kaddoura, S. & Al Husseiny, F. (2021). On-line learning on information security based on critical thinking andragogy. *World Transactions on Engineering and Technology Education, 19*(2), 157–162.

Lake R. (2012). *Vygotsky on education primer*. Peter Lang.

Lin, J., & Wang, Y. L. (2024). Unpacking the mediating role of classroom interaction between student satisfaction and perceived online learning among Chinese EFL tertiary learners in the normal of post-COVID-19. *Acta Psychologica*, *245*(2024) 104233, 1–10. https://doi.org/10.1016/j.actpsy.2024.104233

Martin, A. J. (2014). Academic buoyancy and academic outcomes: towards a further understanding of students with attention deficit/hyperactivity disorder (ADHD), students without ADHD, and academic buoyancy itself. *British Journal of Educational Psychology*, *84*(1), 86–107. https://doi.org/10.1111/bjep.12007

Martin, A., Colmer, S., Davey, L. & Marsh, H. (2010). "Longitudinal modelling of academic buoyancy and motivation: Do the '5 Cs' hold up over time?" *British Journal of Educational Psychology, 80*, 473–496. https://doi.org/10.1348/000709910x486376.

Martin, A. J. & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, *43*(3), 267–281. https://doi.org/10.1002/pits.20149

Martin, A. J. & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology*, *46*(1), 53–83. https://doi.org/10.1016/j.jsp.2007.01.002

Martin, A. J. & Marsh, H. W. (2009). Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs. *Oxford Review of Education,* 35(3), 353–370. https://doi.org/10.1080/03054980902934639

Miller, S., Connolly, P. & Maguire, L. K. (2013). Wellbeing, academic buoyancy and educational achievement in primary school students, *International Journal of Educational Research*, *62*(1), 239–248. https://doi.org/10.1016/j.ijer.2013.05.004

Paakkari, L, & George, S. (2018). Ethical underpinnings for the development of health literacy in schools: ethical premises ('why'), orientations ('what') and tone ('how'). *BMC Public Health, 18*(1), 326. https://doi.org/doi:10.1186/s12889-018-5224-0.

Putwain, D. W., Symes, W., Connors, E. & Douglas-Osborn, E. (2012). Is academic buoyancy anything more than adaptive coping? *Anxiety, Stress and Coping, 25*(3), 349–358. https://doi.org/10.1080/10615806.2011.582459

Robbins, S. B., Lauver, K., Davis, D., Langley, R. & Carlstrom, K. (2004). Do psychosocial and study skill factors predict university outcomes? A meta-analysis, *Psychology Bulletin*, *130*(2), 261–288. https://doi.org/10.1037/0033-2909.130.2.261

Sims, R. (1999). Interactivity on stage: Strategies for learner-designer communication. *Australian Journal of Educational Technology, 15*(3), 257–272. https://doi.org/10.1007/s12528-011-9043-x

Sumrah, A. (2023). EFL online teaching and learning: The impact of environmental factors. *Pegem Journal of Education and Instruction*, *13*(2), 223–235. https://doi.org/10.47750/pegegog.13.02.27

Visser, J. (2000). Faculty work in developing and teaching web-based distance courses: A case study of time and effort. *American Journal of Distance Education*, *14*(3), 21–32. https://doi.org/10.1080/08923640009527062

Vygotsky, L. S. (1987). Thinking and speech. In R. W. Rieber & A. S. Carton (Eds.), *The collected works of L. S. Vygotsky. Vol. 1. Problems of general psychology* (pp. 39–285). Plenum.

Wagner, E. D. (2001). In support of a functional definition of interaction. *The American Journal of Distance Education, 8*(2), 6–26.

Wang, Y., Pan, Z. W., & Wang, M. Z. (2023). The moderating effect of participation in online learning on EFL teachers' teaching ability. *Heliyon*, *9*(3), 1–12. https:// doi.org/10.1016/j.heliyon.2023.e13890

Wang, Y. S., Xin, Y., & Chen, L. (2024). Navigating the emotional landscape: Insights into resilience, engagement, and burnout among Chinese High School English as a Foreign Language Learners. *Learning and Motivation, 86*, 1–16. https://doi.org/10.1016/j.lmot.2024.101978

Wenger, R., McDermott, R., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Harvard Business School Press.

Wu, H., Wang, Y. S., & Wang, Y. L. (2024). How burnout, resilience, and engagement interplay among EFL learners: A mixed-methods investigation in the Chinese senior high school context. *Porta Linguarum*, special issue IX, 193–213. https://doi.org/10.30827/portalin.viIX.29878

Yun, S., Hiver, P. & Al-Hoorie, A. (2016). L2 buoyancy: exploring learners' everyday resilience in the language classroom, paper co-presented at the 2nd Psychology of Language Learning Conference, *Vol. 40*, Jyväskylä, August 22–24. https://doi.org/10.1017/S0272263118000037.

Yun, S., Hiver, P. & Al-Hoorie, A. (2018). Academic buoyancy: exploring learners' everyday resilience in the language classroom, *Studies in Second Language Acquisition*, *40*, 805–830 https://doi.org/10.1017/S0272263118000037