

RESEARCH

Open Access



Impact of the online Stoodle software program on Iranian EFL teachers' autonomy, creativity, and work engagement

Omid Salmanpour¹, Omid Tabatabaei^{1*}, Hadi Salehi¹ and Melor Md Yunus²

*Correspondence:
tabatabaeiomid@yahoo.com

¹ Najafabad Branch, Islamic Azad University, Najafabad, Iran

² Faculty of Education, Universiti Kebangsaan Malaysia, Bangi, Malaysia

Abstract

This study investigated the effect of using Stoodle software program on Iranian EFL teachers' autonomy, creativity, and work engagement in the light of teaching experience and gender. The participants comprised 60 EFL teachers including 30 male (15 novice and 15 experienced) and 30 female (15 novice and 15 experienced) teachers teaching at five language institutes in Ahvaz. Two briefing sessions were held to make the participants familiar with Stoodle and how to use it in their classes. Prior to the implementation of the treatment, all the teachers were required to respond to the three scales of autonomy, creativity, and work engagement. After the implementation of the treatment, they were asked again to respond to the mentioned scales. The results of statistical analysis indicated that using the online Stoodle software program had significant effects on improving EFL teachers' autonomy, creativity, and work engagement. However, gender and teaching experience did not have a significant role in contributing to teachers' autonomy, creativity, and work engagement in the Stoodle condition. Moreover, the interaction between gender and teaching experience did not leave a significant impact on teachers' autonomy, creativity, and work engagement. The results are discussed and implications for language teaching are provided.

Keywords: Creativity online teaching, Stoodle, Teachers' autonomy, Work engagement

Introduction

With technological advancement and its application in the EFL context, a big change in the roles of EFL teachers has been observed (Chu & Liu, 2022). This change has made technological knowledge for EFL instructors a necessity. It is even considered one of the EFL teaching practice assessment criteria (Canh, 2014). EFL teachers' expertise to apply technology in their classes is also regarded as one of the effective teacher characteristics in higher education (Kourieos & Evripidou, 2013). Moreover, the major aim of professional teacher empowerment is seen as assisting teachers to integrate technology into their methodology and assessment (Çimen, 2022).

One of the idealistic and abstract concepts in the realm of pedagogy is autonomy. It is a very complicated concept to be measured, quantified, observed, and defined. It has been defined by some experts in the EFL setting as "the capacity to take control of one's

own learning” (Benson, 2001, p. 47), and in this sense, it has been used to refer to both learner and teacher autonomy. Lamb (2000) posits the same idea when he states that being an autonomous teacher involves exercising some kind of freedom over the curriculum and taking responsibility for professional empowerment. Based on more recent methods of EFL instruction, teachers have been regarded as facilitators of learning, a sort of guide illuminating the path of education. This role is crucial because, during the complicated journey of mastering a foreign language, students are encountered with lots of difficulties. Thus, teachers are expected to create an environment conducive for their students to learn. Unfortunately, in playing such a role, a teacher is not always successful. One thing worth taking into account is creativity.

Sternberg and Lubart (1995) suggest that creativity can be defined as the ability to produce work that is novel and adaptive with regard to task or situational limitations. Creativity in ELT can find itself expressed with regard to methodology, media, resources, material, classroom activities, or in some combination. Nowadays, with the rapid advancement in ICT, teachers are challenged to make use of computers and the internet in ELT. Research has reported that English teaching and learning have become more practical, appetizing, efficient, and effective with technology. However, it requires a lot of open-mindedness and curiosity on the part of teachers. Besides open-mindedness and curiosity, at times, creativity needs imagination and/or problem-solving skills too.

The outset of this century coincided with increased attention to what has been coined as positive psychology: the scientific study of human power and optimal functioning (Seligman & Csikszentmihalyi, 2000). Luthans (2002 as cited in Schaufeli et al., 2006) further expounded the approach as “the study of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today’s workplace” (p. 698). Work engagement is one of such positive state, which is regarded as the antipode of burnout. Work engagement is defined as a positive, fulfilling work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, Gonzalez-Romá, & Bakker, 2002).

Teachers’ gender and its role in language classrooms have become an increasingly significant issue in SLA studies. Based on the findings of the previous pertinent research, there is a strong correlation between EFL learners’ achievement and the gender of their language teacher (Dee, 2006; Lavin et al., 2012; Manjari, 2005). Apart from the dichotomy that characterizes ‘gender’ as a concept (as in biological male/female), the teacher’s gender is linked to a host of other (mostly stereotypical) male/female personality traits and teaching styles that are usually determined and judged by the students who are at the receiving end of the teaching process (Antecol et al., 2012; Rahimi & Soryani, 2014). In fact, one cannot teach a subject without projecting some kind of attitude or gender bias toward this subject to the students (Brosh, 1996).

This study is underpinned by the evolving landscape of English as a Foreign Language (EFL) teaching, where the integration of technology has become imperative, driven by technological advancements in recent years (Chu & Liu, 2022). Notably, technological knowledge has emerged as a critical assessment criterion in EFL teaching practices (Canh, 2014), and teacher empowerment in EFL education is intricately linked with the effective utilization of technology (Çimen, 2022). Moreover, autonomy, a complex

and pivotal concept in pedagogy, plays a crucial role, encompassing both learner and teacher autonomy, where teachers are expected to exercise freedom over their curriculum and take responsibility for professional development, often involving technology integration (Benson, 2001; Lamb, 2000). Creativity is also paramount, as teachers are challenged to be open-minded, curious, imaginative, and proficient problem solvers in utilizing technology effectively (Sternberg & Lubart, 1995). Positive psychology emphasizes strengths and optimal functioning, with work engagement, characterized by vigor, dedication, and absorption, associated with teacher performance and technology's potential role in enhancing it (Schaufeli, Salanova, Gonzalez-Romá, & Bakker, 2002). Gender in EFL teaching has gained attention for its potential impact on student achievement and perceptions of teaching styles (Dee, 2006; Lavin et al., 2012; Manjari, 2005). Finally, experience, especially in EFL teaching, has traditionally been a key qualifier, and this study recognizes its influential role in addressing new educational challenges and aims to explore how teaching experience intersects with the adoption of software programs and technology in education. In light of these multifaceted factors, this research aims to investigate the intricate interplay between EFL teachers' technological expertise, autonomy, creativity, work engagement, gender, and experience, ultimately contributing to the enhancement of EFL education practices.

Literature review

The theoretical background of this study is rooted in the dynamic field of English as a Foreign Language (EFL) teaching, which has been significantly influenced by advancements in technology. In recent years, technological innovations have reshaped the roles of EFL teachers, necessitating a fundamental shift in their skill sets and teaching practices (Chu & Liu, 2022). This transformation underscores the growing importance of technological knowledge and expertise among EFL instructors. Furthermore, technology proficiency has become a prominent assessment criterion in EFL teaching practices (Canh, 2014), highlighting the imperative for EFL teachers to adapt to this evolving educational landscape. This paradigm shift aligns with the broader goal of empowering teachers to integrate technology seamlessly into their pedagogy and assessment strategies (Çimen, 2022). In this context, the study explores how EFL teachers' technological competence, in combination with other factors, shapes their teaching practices and student outcomes.

Autonomy, an idealistic and multifaceted concept within the realm of pedagogy, represents a critical aspect of the theoretical framework. Autonomy, as defined by Benson (2001), encompasses the capacity to take control of one's own learning, encompassing both learner and teacher autonomy. In EFL education, autonomous teachers exercise freedom over curriculum design and take responsibility for their professional development, including the integration of technology (Lamb, 2000). Additionally, creativity, characterized by the ability to produce novel and adaptive work, plays a pivotal role in EFL teaching, particularly when it comes to effectively utilizing technology (Sternberg & Lubart, 1995). This study recognizes the multifaceted nature of teacher autonomy and creativity in the context of technology integration and aims to explore how these factors contribute to enhanced EFL teaching practices. By examining the interplay between technological competence, autonomy, creativity, work engagement, gender, and

experience, this research seeks to provide a comprehensive theoretical foundation for understanding the complex dynamics of EFL education in the digital age and its broader implications for educational practices and outcomes.

Online learning classes

The advent of online resources has impacted all fields of education, including second or foreign language learning (Jin & Deifell, 2013). A large number of foreign language learners in college and university-level language classes in different countries are adequately technologically savvy to thrive in an increasingly digitally connected world (Prensky, 2001). From the myriad of technological advancements that stem from distance education, online learning classes have recently dominated language classes in many parts of the world. Online learning classes have been advocated by many practitioners as being a cost-effective and convenient form of instruction that has dominated and to some extent supplanted traditional educational centers in different parts of the world (Richardson & Swan, 2003). In a similar vein, Allen and Seaman (2011) claimed that “in 2002, less than half of higher education institutions reported that online education was critical to their long-term strategy. This figure is now close to seventy percent” (p. 4).

Online learning can be described as a “faculty-delivered [form of] instruction [delivered] via the Internet” (Feenberg, 1998, p. 21). It is commonly argued that online learning classes have the advantage of accessibility, flexibility, and promotion of varied forms of instruction (Ally, 2004). This has been hugely addressed by many educational institutions in different parts of the world, advertising their online classes as being accessible to students 24 h a day and location independent. Furthermore, it gives the participants a chance to ponder upon materials and ruminate on them at their own pace. This in turn helps language learners to effectively store and retrieve information (Richardson & Swan, 2003). Another major advantage of many online classes is that the roles of students and instructors have been transformed to adapt to the altered educational environment. The instructor has the role of the facilitator and is no longer perceived as an authority who dominates language classes. Language learners have taken a more prominent role in online classes, irrespective of race, gender, inability, or appearance (Richardson & Swan, 2003).

Stoodle software

Stoodle is a real-time Internet teaching and collaboration tool that was founded by Arjun Mehta, the president; Divyahans Gupta, VP of Engineering; Simar Mangat, VP of marketing; and Maverick McNealy, advisor. Stoodle has become a way for many students to review for tests and explain difficult concepts to their classmates. The variety of features present in this software includes a LaTeX equation editor, free-form input, text input, live chat, drawing tools, and the ability to voice chat. A particularly innovative feature is real-time file sharing, in which the moderator of the session can upload a document to the Assets area for all others to access.

Many teachers find this software useful because it enables peer-to-peer teaching and learning. This interaction can add a lot of value to the classroom by encouraging open discussion of particularly difficult problems. Divyahans explained how the software works. “Stoodle is primarily Flash-based, but we are looking to expand it to HTML5 so

that it can work on an expanded range of mobile devices,” Divyahans said. After refining the software and renaming it Stoodle, the team presented its idea to CK-12, an educational organization that provides free, customized, open-source material to teachers and students that concurs with California standards. “We presented to [CK-12], and we were looking for advice; we weren’t sure where to go, we just did it,” Simar said. “And as soon as we finished, they said ‘We have an office for you, we’ll give you funding and resources to help take it forward,’ and that was an amazing feeling.” According to Simar, Stoodle has also been implemented in other schools in this process of expansion, such as Leadership Public School and the Nueva School. The teachers at these schools, he added, especially like to use this software to teach science and math.

Teachers’ autonomy

As many scholars (e.g., Benson, 2004; Allford & Pachler, 2007; Jiménez Raya & Lamb, 2008) have contended one of the key objectives of education is to provide students and teachers more autonomy. Little (1991) has made a compelling case for how successful teaching and learning are facilitated by the growth of learner autonomy, which is increasingly recognized as the ultimate objective of foreign language education. Unfortunately, there is a serious lack of relevant research on technology and teacher autonomy, and the majority of earlier studies focused on students rather than instructors.

Understanding teacher autonomy and its effects is the subject of much current study globally. It’s interesting to note that these studies have shown significant behavioral and learning effects on both students and instructors. By identifying teacher autonomy as a significant area of concern, the AILA Scientific Commission on Learner Autonomy Symposium in Tokyo (Dam, 1995) convened the symposium outlining the potential for teacher-learner autonomy. The decision-making abilities of students are shaped in the same way by the many characteristics of teacher autonomy outlined by Lamb (2000). One of the precise definitions of teacher independence, according to a Japanese author named Aoki (2000), is the ability, freedom, and/or responsibility to choose one’s own educational path. Creating a teacher-learning environment that offers clear insights into learner autonomy is what professional teacher autonomy (Smith, 2000) is all about.

Creativity

Rybakowski et al. (2008) considered creativity as a connection of ideas and behaviors that both of them are necessary for life. Creativeness is any idea, procedure, or result that considerably changes the present status (Thys et al., 2013). Creativeness is defined as the capability to better procedures or attainments that are novel, pertinent, and chichi while reconciling to the background in which it occurs (Long, 2014; Runco, 2013; Runco & Jaeger, 2012). These days, creativity changes to vital and it is necessary to reach a person, establishment, or country. It can cover all the acts and thoughts. It has been rightly said that creativeness is related to surfaces of success in second language education. It is believed that the current methods of language teaching create creativity in learners of a number of language tasks – especially those that include student-centered, interactive, and open-ended elements, and are therefore in principle ideally suited to boost creative thinking and behavior on the part of learners (Burton, 2010). In Cropley and Cropley’s (2010) and Runco’s (2004) view, the class has been considered one of the most obvious

elements in the field of promoting creativity and improving the personality and social skills of students. Teachers should use this chance to practice creative teaching activities in the classroom to understand the curriculum as an opportunity to improve creativity. Therefore, it can better omnificent thoughts between pupils (Park et al., 2006). It can seem mental steps that persuade an invention, solution, or new connection in any field, are creativity poles and creative thinking (Rybakowski et al., 2008).

Teachers always can support learners to encourage their creativity level. A study on the aspects of having a creative classroom was conducted by Ritter, Polnick, Fink, and Oescher (2010). They believed that classroom management is one of the major factors of the creative classroom. In this condition, the teacher, their teaching methods and tactics, leadership, and behavior are at the center of attention. All the learners in class have some degree of creativity. Teachers are responsible for sending it out. By creating a safe environment and interacting with students as more educated people to foster students' creativity and act as a mediator, educators can suggest different ways for students (Mostafavi et al., 2020).

Work engagement

Work engagement is one of these beneficial moods and is recommended as a preventative measure against burnout. Unlike individuals who experience job burnout, engaged workers believe they are capable of handling the demands of their jobs with ease. They sense an enthusiastic and effective connection with their work activities. According to Schaufeli et al. (2002), the term "work engagement" refers to a pleasant and fulfilling mental state that is marked by tenacity, devotion, and absorption. According to Schaufeli et al. (2002), the term "engagement" refers to a happy, contented mental state that is marked by vitality, devotion, and absorption. According to Schaufeli et al., "vigor" is defined as having high levels of energy and mental fortitude when working, as well as the desire to put out effort in one's job. The definition of dedication is given as "a sense of significance, enthusiasm, inspiration, pride, and challenge" (Schaufeli et al., p. 74). According to Schaufeli et al., assimilation is the last level of involvement, which is characterized by intense concentration on one's job, rapid time passing, and difficulty disengaging from it.

Given that all factors relating to the teacher must be taken into account and that the negative aspects of teaching have received more attention in the literature on health psychology (Hakanen et al., 2006), recent research has concentrated on concepts like work engagement, which is a protective factor against burnout. The findings of research conducted by Wingerden et al. (2017) demonstrate that the intervention of personal resources is connected to those elements of oneself, including resilience and the ability to change the environment, that have a positive causal consequence on job engagement.

Research questions

In line with the objectives of the study, the following research questions were formulated:

RQ1: Does using the online Stoodle software program have any significant effect on Iranian male and female experienced and novice EFL teachers' autonomy?

RQ2: Does using the online Stoodle software program have any significant effect on Iranian male and female experienced and novice EFL teachers' creativity?

RQ3: Does using the online Stoodle software program have any significant effect on Iranian male and female experienced and novice EFL teachers' work engagement?

Methodology

Participants

The participants of the study consisted of 60 Iranian EFL teachers working at five reputable language institutes in Ahvaz, Iran. Since for the purposes of the study, male and female teachers were required, an attempt was made to select an equal number of participants from both gender groups (male and female). The objectives of the study also entailed that the participants had to be novices and experienced, thus, consulting the relevant previous research, it was decided to include an equal number of teachers based on their years of teaching experience, in a sense that those who have been engaged in teaching English for less than five years were considered as novice and those being involved in EFL teaching for more than five years were regarded as experienced. Therefore, out of 60 EFL teachers who agreed to participate in the study, 30 were male (15 novice and 15 experienced) and 30 female (15 novice and 15 experienced). The sampling technique was purposive in that only EFL teachers who were novices and experienced were selected. In addition, it was also convenient in that the participants needed to be accessible and agreed to participate in the research.

Materials

Stoodle software

Stoodle is a free tool where users can join an online classroom by simply sharing a URL. It offers real-time collaboration and communication; multiple users can work on the same virtual whiteboard at the same time through text chat and voice conferencing using their computer's microphone. They can also type, draw, search, and upload images. It is a virtual board that allows for asynchronous and synchronous communication as well as backchanneling. If one feels that the students are passive participants in the learning process, Stoodle promotes participation and engagement, it works great for group work and project planning, one-on-one support, providing feedback, and tutoring. Teachers and students can share resources and interests, brainstorm, and clarify ideas, extend class discussions, and keep track of resources for a project. Because Stoodle is web-based, one does not need to worry about server space at school, and Students would create a virtual whiteboard about a character from a story. They will share their knowledge about the inside and outside traits of a character. They will organize sentences around a Stoodle board (by moving around the text boxes) to create a diagram of the inside and outside traits of a character. Students can access this resource from any computer—at home, at school, or the public library.

To access this free virtual whiteboard, the user needs to go to <http://stoodle.ck12.org/>. S/he does not need to sign up, just click on "Launch a Classroom" after typing the name. Stoodle will ask for permission to access the user's microphone and computer camera, so s/he can do audio conferences, and upload video. S/he will be able to copy and paste the URL to invite people to the class. The user can also send the link using the embedded sharing buttons of Facebook, Twitter or email. Anyone with the link can now be part of the class, it is accessible through any browser, any computer or mobile device with

internet browsing capability. S/he will be able to see the participants' names in the chat area, and the users can text as they work together. The tools on the right side of the Stoodle board are for drawing simple pictures with a pen tool, inserting text using the keyboard, moving objects around, erasing objects, and s/he can also use the undo and redo functions. Among the tools on the left side, s/he will find the sharing buttons, inserting squares, circles and lines, uploading images and documents. This one is the top feature of Stoodle, the user needs to select the area where s/he wants to place the picture, then s/he'll see that s/he can access images and files on the computer and many more places such as Facebook, Twitter, Dropbox, or Google drive. The user can also take a picture or record video by authorizing the web camera and search images on the web. Once the users have uploaded an image, they can move it around; however, they cannot change its size. Anyone with access to the stoodle can add or use any of the tools. Users can create multiple pages by adding a new one with the arrows located at the lower right corner. After creating the collaborative project with Stoodle, users can email it or share it. It will be saved and available anytime they use the URL for that specific project.

Instruments

Teacher classroom autonomy rating scale

The scale was designed and validated by Diyan and Adediwura (2016). The scale covers aspects of teacher classroom autonomy such as teacher satisfaction, teaching information, selecting textbooks and other instructional materials, selecting content, topics, and skills to be taught, teaching technique, evaluating and grading students, disciplining students, determining the amount of homework to be assigned, teacher responsibility, the opportunity to participate in a decision which affects the teacher, the opportunity for independent and creative thought and action. These items were moderated and reviewed by experts in the fields of Tests and Measurement and Psychology to determine the appropriateness, relevance and adequacy of the items (content validity). The response pattern adopted was a Likert format with five options ranging from SA = strongly Agree, A = Agree, Undecided D = Disagree and SD = Strongly Disagree.

The internal consistency of the scale was $r = 0.913$ (estimated via the Cronbach formula), as reported by the designer and factor analysis demonstrated a high construct validity for the scale. To uncover the validity, construct and convergent validity of the third version (final version) was ascertained. The construct validity was determined using two methods. The first was Kaiser or eigenvalues greater than-one criterion (K1), (Kaiser, 1960). The second was Cattell (1966) scree test, which involved an examination of a plot of the eigenvalues for breaks or discontinuities. In doing this, Exploratory Factor Analysis (EFA) a good technique for studying the dimensionality of a scale (Spector, 2006) was applied so as to explore the dimensionality of the scale with the aim of determining (a) the number of factors that best represent the items and (b) the interpretation of the factors.

Teacher creativity scale

In order to measure the degree of EFL teachers' creativity, the scale designed by Pishghadam et al. (2012) was employed. The scale comprised 60 multiple-choice items ranging from "always" to "never", requiring 20 min to complete. It was multidimensional and

included seven dimensions namely Originality and Elaboration, Fluency and Flexibility, Person (Teacher), Press (Environment) and Materials, Motivation, Independent Learning, Autonomy, and Brainstorming. To fit the purposes of the study, the structure and wording of some of the items were changed and therefore, the reliability and validity needed to be reaffirmed. To estimate the reliability, a pilot study was performed on a smaller sample of EFL teachers (No. 15) with the same characteristics as the major participants of the study. To estimate the internal consistency, Cronbach alpha was used and the result turned out to be 0.78. To ascertain the validity of the scale, the opinion of three TEFL experts with much experience in similar research publications was sought. They confirmed the content relevance and content coverage of the items included in the scale.

Work engagement scale

The shortened form of the Utrecht Work Engagement Scale (UWES), designed and validated by Schaufeli et al. (2006) was used. It is a short questionnaire to measure work Engagement, a positive work-related state of fulfillment that is characterized by vigor, dedication, and absorption. To validate the original scale, the researchers collected the data in 10 different countries ($N = 14,521$), and results indicated that the original 17-item Utrecht Work Engagement Scale (UWES) can be shortened to 9 items (UWES-9). The factorial validity of the UWES-9 was demonstrated using confirmatory factor analyses, and the three scale scores had good internal consistency and test–retest reliability. Furthermore, a two-factor model with a reduced Burnout factor (including exhaustion and cynicism) and an expanded Engagement factor (including vigor, dedication, absorption, and professional efficacy) fit best to the data. These results confirmed that work engagement may be conceived as the positive antipode of burnout. It was concluded that the UWES-9 scores had acceptable psychometric properties and that the instrument could be used in studies on positive organizational behavior.

Data collection procedure

The first step to conduct the study was to select male and female and also novice and experienced EFL teachers. Since the research method was a quasi-experimental one, a sufficient number of EFL teachers were required to take part in the study, and because enough teachers with such features do not work in one institute, the researcher decided to select them from five language institutes in Ahvaz. Appointments were made with the institutes' owners to receive the required permission and the teachers needed to be selected based on their ease of accessibility and also willingness to participate in the research. It seemed that selecting 60 EFL teachers of both gender groups who were novice and experienced would serve the purposes of the study. Therefore, 60 EFL teachers, 30 male and 30 female were selected non-randomly. Out of each gender group, 15 teachers were novice having less than 5 years of teaching experience and 15 had more than 5 years of teaching experience. Two briefing sessions were held with them to make them familiar with the software programs and how to use them in their classes. Prior to the implementation of the treatment, all the teachers needed to respond to the three scales of autonomy, creativity, and work engagement. After the implementation of the treatment, they were asked again to respond to the mentioned scales to unveil the impact of

the software program on the dependent variables of the study. Ultimately, the obtained data were analyzed to answer the research questions.

The first research question

To answer the first research question, the autonomy pre-test and post-tests of the Stoodle condition had to be compared. The descriptive statistics of the tests are represented in the following Table 1.

The table above shows that the autonomy mean score of the teachers who experienced Stoodle went up from 42.95 on the pre-test to 69.48 on the post-test. To see if this was a significant rise or not, the results of paired-samples *t* test in Table 2 had to be checked.

It could be found in Table 2 that there was a significant difference between the autonomy pre-test and post-test scores of the teachers in the Stoodle condition, $t(59) = -42.63$, $p = 0.000 < 0.05$. Now, to see if the teachers' experience and gender also had an effect on this improvement in the sphere of autonomy, the results of two-way ANCOVA should be checked (Table 3).

Table 1 Descriptive statistics for the autonomy pre-test and post-test of the stoodle condition

	Mean	N	Std. Deviation	Std. Error Mean
Autonomy pre-test	42.9500	60	9.70833	1.25334
Autonomy post-test	69.4833	60	10.73801	1.38627

Table 2 Paired-sample *t* tet results comparing the autonomy pre-test and post-test scores in the stoodle condition

	Paired differences				<i>t</i>	<i>Df</i>	Sig (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% confidence interval of the difference				
				Lower				Upper
Autonomy pre-test – autonomy post-test	- 26.53	4.82039	0.62231	- 27.77857	- 25.28809	- 42.637	59	0.000

Table 3 Descriptive statistics for gender and teaching experience: autonomy post-test scores of the Stoodle condition

Gender	Experience	Mean	Std. Deviation	N
Male	Novice	67.3333	12.38471	15
	Experienced	73.3333	8.38934	15
	Total	70.3333	10.83205	30
Female	Novice	67.3333	9.91151	15
	Experienced	69.9333	11.74410	15
	Total	68.6333	10.75906	30
Total	Novice	67.3333	11.02140	30
	Experienced	71.6333	10.17598	30
	Total	69.4833	10.73801	60

Table 4 Results of Two-way ANCOVA for the Effects of Gender and Teaching Experience on Autonomy Post-test Scores of the Teachers in the Stoodle Condition

Source	Type III sum of squares	df	Mean Square	F	Sig	Partial eta squared
Corrected model	5546.606	4	1386.652	60.703	0.000	0.815
Intercept	2049.910	1	2049.910	89.738	0.000	0.620
Autonomy pre-test	5182.556	1	5182.556	226.875	0.000	0.805
Gender	41.693	1	41.693	1.825	0.182	0.032
Experience	53.570	1	53.570	2.345	0.131	0.041
Gender * Experience	17.373	1	17.373	0.761	0.387	0.014
Error	1256.377	55	22.843			
Total	296,479.000	60				
Corrected total	6802.983	59				

The total mean score for male teachers on the autonomy post-test in the Stoodle condition was 67.33, and the total mean score for female teachers equalled 68.63. In addition, novice teachers obtained a mean score of 67.33, while experienced teachers' mean score was 71.63. To see if these differences between male and female teachers on the one hand and between novice and experienced teachers on the other hand could be large enough to reach statistical significance or not, the results of the two-way ANOVA in Table 4 should be examined.

The results presented above reveal that gender did not have a significant role in the autonomy post-test scores of the teachers in the Stoodle condition ($p=0.182$); likewise, teaching experience failed to affect the autonomy of the teachers in this condition ($p=0.131$). Moreover, the interaction between these two variables (i.e., gender and teaching experience) also did not leave a significant impact on the autonomy of the teachers ($p=0.387$).

The second research question

To answer the second research question, the creativity pre-test and post-tests of the Stoodle condition had to be compared. The descriptive statistics of the tests are represented in the following Table 5.

The table above shows that the creativity mean score of the teachers who experienced Stoodle went up from 69.73 on the pre-test to 136.55 on the post-test. To see if this was a significant rise or not, the results of the paired-sample t-test in Table 6 had to be checked.

It could be found in Table 5 that there was a significant difference between the creativity pre-test and post-test scores of the teachers in the Stoodle condition, $t(59) = -59.81$, $p = 0.000 < 0.05$. Now, to see if the teachers' experience and gender also had an effect on this improvement in the sphere of creativity, the results of two-way ANCOVA should be checked (Table 7).

Table 5 Descriptive statistics for the creativity pre-test and post-test of the stoodle condition

	Mean	N	Std. Deviation	Std. Error Mean
Creativity pre-test	69.7333	60	8.81037	1.13741
Creativity post-test	136.5500	60	11.06747	1.42880

Table 6 Paired-sample t test results comparing the creativity pre-test and post-test scores in the stoodle condition

	Paired differences				t	df	Sig (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% confidence interval of the difference				
				Lower				Upper
Creativity pre-test – Creativity post-test	– 66.81667	8.65241	1.11702	– 69.05182	– 64.58151	– 59.817	59	0.000

Table 7 Descriptive statistics for gender and teaching experience: creativity post-test scores of the stoodle condition

Gender	Experience	Mean	Std. Deviation	N
Male	Novice	137.66	9.84	15
	Experienced	136.20	10.317	15
	Total	136.93	9.93	30
Female	Novice	138.40	11.95	15
	Experienced	133.93	12.54	15
	Total	136.16	12.25	30
Total	Novice	138.03	10.76	30
	Experienced	135.06	11.34	30
	Total	136.55	11.06	60

The total mean score for male teachers on the creativity post-test in the Stoodle condition was 136.93, and the total mean score for female teachers equaled 136.16. In addition, novice teachers obtained a mean score of 138.03, while experienced teachers' mean score was 135.06. To see if these differences between male and female teachers on the one hand and between novice and experienced teachers, on the other hand, could be large enough to reach statistical significance or not, the results of the two-way ANOVA in Table 8 should be examined.

Table 8 Results of two-way ANCOVA for the effects of gender and teaching experience on creativity post-test scores of the teachers in the Stoodle condition

Source	Type III sum of squares	Df	Mean Square	F	Sig	Partial eta squared
Corrected model	3170.655	4	792.664	10.748	0.000	0.439
Intercept	5501.038	1	5501.038	74.591	0.000	0.576
Creativity pre-test	2996.072	1	2996.072	40.625	0.000	0.425
Gender	139.007	1	139.007	1.885	0.175	0.033
Experience	12.556	1	12.556	0.170	0.681	0.003
Gender * Experience	36.279	1	36.279	0.492	0.486	0.009
Error	4056.195	55	73.749			
Total	1,125,981.000	60				
Corrected total	7226.850	59				

The results presented above reveal that gender did not have a significant role in the creativity post-test scores of the teachers in the Stoodle condition ($p=0.175$); likewise, teaching experience failed to affect the creativity of the teachers in this condition ($p=0.681$). Moreover, the interaction between these two variables (i.e., gender and teaching experience) also did not leave a significant impact on the creativity of the teachers ($p=0.686$).

The third research question

To answer the third research question, the engagement pre-test and post-tests of the Stoodle condition had to be compared. The descriptive statistics of the tests are represented in the following Table 9.

The table above shows that the engagement mean score of the teachers who experienced Stoodle went up from 18.90 on the pre-test to 36.71 on the post-test. To see if this was a significant rise or not, the results of the paired-sample *t*-test in Table 10 had to be checked.

It could be found in Table 10 that there was a significant difference between the engagement pre-test and post-test scores of the teachers in the Stoodle condition, $t(59) = -51.91, p=0.000 < 0.05$. Now, to see if the teachers’ experience and gender also had an effect on this improvement in the sphere of engagement, the results of two-way ANCOVA should be checked (Table 11).

The total mean score for male teachers on the engagement post-test in the Stoodle condition was 37.03, and the total mean score for female teachers equalled 36.40. In addition, novice teachers obtained a mean score of 35.96, while experienced teachers’ mean score was 37.46. To see if these differences between male and female teachers on the one hand and between novice and experienced teachers, on the other hand, could be large enough to reach statistical significance or not, the results of the two-way ANCOVA in Table 12 should be examined.

Table 9 Descriptive statistics for the engagement pre-test and post-test of the Stoodle condition

	Mean	N	Std. Deviation	Std. Error Mean
Engagement pre-test	18.9000	60	4.71097	0.60818
Engagement post-test	36.7167	60	4.21495	0.54415

Table 10 Paired-sample t test results comparing the engagement pre-test and post-test scores in the Stoodle condition

	Paired differences				T	df	Sig (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% confidence interval of the difference				
				Lower				Upper
Engagement Pre-test – Engagement Post-test	-17.81667	2.65848	0.34321	-18.50342	-17.12991	-51.912	59	0.000

Table 11 Descriptive statistics for gender and teaching experience: engagement post-test scores of the Stoodle condition

Gender	Experience	Mean	Std. Deviation	N
Male	Novice	36.3333	4.79086	15
	Experienced	37.7333	3.65409	15
	Total	37.0333	4.24657	30
Female	Novice	35.6000	4.57946	15
	Experienced	37.2000	3.83964	15
	Total	36.4000	4.23125	30
Total	Novice	35.9667	4.61992	30
	Experienced	37.4667	3.69280	30
	Total	36.7167	4.21495	60

Table 12 Results of Two-way ANCOVA for the Effects of Gender and Teaching Experience on Engagement Post-test Scores of the Teachers in the Stoodle Condition

Source	Type III sum of squares	df	Mean Square	F	Sig	Partial eta squared
Corrected model	747.938	4	186.98	34.25	0.000	0.714
Intercept	1391.618	1	1391.61	254.92	0.000	0.823
Engagement pre-test	708.022	1	708.022	129.69	0.000	0.702
Gender	2.025	1	2.025	0.371	0.545	0.007
Experience	22.226	1	22.226	4.071	0.049	0.069
Gender * Experience	4.989	1	4.989	0.914	0.343	0.016
Error	300.245	55	5.459			
Total	81,935.000	60				
Corrected total	1048.183	59				

The results presented above reveal that gender did not have a significant role in the engagement post-test scores of the teachers in the Stoodle condition ($p=0.545$); likewise, teaching experience failed to affect the engagement of the teachers in this condition ($p=0.049$). Moreover, the interaction between these two variables (i.e., gender and teaching experience) also did not leave a significant impact on the engagement of the teachers ($p=0.343$).

Discussion

This study aimed at investigating the effect of using the online Stoodle software program on Iranian male and female experienced and novice EFL teachers' autonomy, teachers' creativity, and work engagement. The results indicated that using the online Stoodle software program had significant effects on improving EFL teachers' autonomy, creativity, and work engagement. However, gender and teaching experience did not have a significant role in contributing to teachers' autonomy, creativity, and work engagement in the Stoodle condition. Moreover, the interaction between gender and teaching experience also did not leave a significant impact on teachers' autonomy, creativity, and work engagement.

Various dimensions of autonomous teaching and learning can be enhanced through the application of technological tools and devices. Technology has the potential to provide access to different pedagogical resources and also facilitate the teachers' choice of appropriate materials. In addition, a good number of technology-supported conditions are available for pedagogical purposes. Nonetheless, it has been demonstrated in various studies (e.g., Curras-Perez et al., 2014; Reinders, & Darasawang, 2012) that the effective and practical use of technology requires a proper amount of autonomy. Technology can be properly employed to explicitly support the development of teacher autonomy, but such attempts are rare. There are instances of both autonomy-supportive technology use (i.e., technology that facilitates autonomous teaching) and autonomy-developing technology use (i.e., technology that guides educators in developing autonomy).

Various software programs have been introduced for the development of language competencies among which we can refer to Stoodle software program. Tech-savvy teachers who make use of such programs have also begun to embrace children's interest in 'digital play,' creating language learning opportunities through the use of computer games within an educational context – this is sometimes known as digital games-based learning (DGBL). These programs have the potential to provide learners with the opportunity to communicate with others, often native speakers of the language they are learning, or other learners studying the same language, but who do not share the same home language, so they are forced to make use of English to communicate. Synchronous solutions like video-conferencing (Quinn & Phillips, 2010) and face-to-face interaction through online formats (Hew & Cheung, 2010; Zheng et al., 2009) are becoming increasingly popular as vehicles to promote language learning. Video conferencing is being used to bring learners together over distance so that they can communicate in a common language and share cultural experiences. All these potentials would remove the work overload of the teachers and facilitate their jobs which all add to their autonomy. Information and communication technology (ICT) and digital technologies have great potential for improving creativity due to the fact that they provide tools and processes serving audiences of all ages and abilities and across the curriculum. Creativity is one of the most complicated concepts in psychology. Different definitions have been provided for creativity, but they all emphasize people's ability to produce products that are not only of high quality but also novel (Charaya et al., 2017). According to Boden (2001), creativity is the creation of novel ideas that are astonishing yet intelligible, and also precious in different ways. Scott and Denning (2003) enumerated five features of creativity including imagination, a fashioning process, pursuing purpose, being original and judging value. Resnick (2008) argued that "Success in the future- for individuals, for communities, for companies, for nation as a whole- will be based not on what we know or how much we know, but on our ability to think and act creatively". Cordes et.al (2000) asserted that argue that creativity and the use of ICT tools enhance pedagogical opportunities in the classroom.

Based on the study conducted by Loveless (2002, 2007) focusing on the features of ICT tools that enhanced creativity in both teachers and students. The features explored were interactivity, multiple types/forms of information, range, speed, and automatic functions, and characteristics that allow users to do things that could not be done as effectively, or at all, by using other tools. They added that ICT tools have

the potential to create changes, to opt for alternatives, and to keep track of the progress of their ideas. Interactivity enables learners to play games, and exchange feedback. Furthermore, the speed and automatic functions of ICT software programs facilitate the storage, transformation, and display of information, thus enabling learners to be involved in higher cognitive levels of interpretation, analysis, and synthesis of information. The ICT-based work environment has changed the ways tasks are performed. In the ICT-based work environment, it is more convenient to perform tasks while maintaining close relationships with colleagues rather than doing them alone. Furthermore, because the information needed in performing tasks can be easily searched using ICT, more job autonomy can be attained with ICT. According to Ayyagari et al. (2011), ICT deployment may induce job stress, but may also be a factor that facilitates interaction and communication among individuals. Therefore, it is expected that ICT plays a facilitative role by strengthening the effect of work engagement and autonomy.

Teachers' performance is deeply influenced by work engagement. It is a determining factor for progress in job and teachers' professionalism. Bakker et al., (2008, p.11), defined work engagement as a "positive, fulfilling, effectively motivating state of work-related subjective well-being". Work engagement is an important index for the quality of working life. In addition, it is an important factor in understanding behaviours such as labor transfer, reluctance to work and absenteeism (Aryee, 2007). Thus, it is possible to say that work engagement in teaching staff is a very important factor in terms of the performance and efficiency of the teacher. Relationships that a teacher builds on trust with the other internal stakeholders in the school can provide a feeling of engagement with work. Teachers who are engaged in their work can also be decisive in transforming their schools into successful and efficient schools (Gülbahar, 2017). Some teachers consider the digitalization of educational centers and instruction as a challenging part of their job (Syvänen, Mäkinen, Syrjä, Heikkilä-Tammi, & Viteli, 2016). There are different supportive workplace factors that can enhance work engagement as well as the willingness to use educational technology. In line with the definition presented above, it is suggested that workplace resources are factors that help teachers to integrate and use educational technology at work and complete related work tasks. Prior studies on work engagement suggest that individual-, group- and organization-level workplace resources, such as social support, autonomy and technology (Schaufeli & Bakker, 2004; Ventura et al., 2015; Xanthopoulou et al., 2007), are associated with higher work engagement. In line with these findings, it is assumed that high technology-related autonomy (i.e., teachers can freely make decisions regarding the use of educational technology), technology-related social support (i.e., colleagues give advice concerning educational technology) and technology-related competence support (i.e., individuals have enough time to use educational technology) are all associated with higher work engagement.

The results of the study also indicated that teachers' experience and gender did not have a significant effect on teachers' autonomy, creativity, and work engagement. It means that all teachers with varying experiences and gender can equally benefit from the use of technology to become autonomous. Software programs would provide equal opportunities for various teacher groups to facilitate their job and help them to become autonomous.

Conclusion

The findings of the study indicated that technology in general and the use of appropriate software programs in particular in EFL context can lead to the enhancement of autonomy, creativity, and work engagement of EFL teachers. However, it was revealed that gender and teaching experience do not have a significant effect and all teachers with different genders and teaching experience can benefit from the use of ICT tools in a pedagogical context. It can be concluded that technology-related autonomy and competence support were relevant to the promotion of teachers' proper use of ICT tools. The use of technology requires new skills on the part of both learners and teachers. As an increasing number of new teaching opportunities develop, teachers need to become ever more adept at managing their own teaching. As control over the learning process devolves to learners, teachers will need to find alternative ways to support learning in an increasingly wide range of contexts. This is not merely a mechanical shift in the ways teachers interact with students but instead, it involves a pedagogical transformation in the roles of teachers as facilitators of learning; curating resources, fostering autonomy, encouraging critical reflection, and engaging with learners.

The findings of this study bear useful implications for various pedagogical stakeholders including EFL teachers and researchers. The implementation of technology as examined by teachers in this study provides examples of how EFL teachers could build their creativity and autonomy through the use of technology in their practice. The findings showed that ICT use and professionalism corresponded with work engagement. Identification of specific variables from job demands and resources significantly contributed to teachers as individuals and the development of their professionalism.

This study represents a preliminary effort to examine the effect of two practical software programs on the autonomy, creativity, and work engagement of EFL teachers. The study faced several limitations. First, it was susceptible to sampling bias, as the sample selected may not have been representative of all Iranian EFL teachers. Second, the study suffered from a small sample size, which limited its statistical power and the ability to draw broad conclusions. Third, reliance on self-reporting introduced potential response bias, as teachers may have provided socially desirable responses or overestimated the impact of the software program. Furthermore, the study primarily focused on short-term effects, potentially overlooking long-term impacts, which could differ significantly. Lastly, the findings were context-specific to the Iranian EFL teaching environment, making it challenging to generalize the results to other educational settings or countries. These limitations should be considered when interpreting the study's findings and implications.

Further research is needed for a thorough understanding of this issue and to confirm the findings. The first area for future research should focus on assessing the long-term effects of the Online Stoodle Software Program on Iranian EFL teachers' autonomy, creativity, and work engagement. A longitudinal study would help us understand whether the initial impact endures or changes over an extended period.

Secondly, comparative studies can provide valuable insights by evaluating the effectiveness of the Online Stoodle Software Program against other educational technology tools, thereby helping identify the most beneficial solutions for EFL teachers. Cross-cultural research represents another promising avenue, as it would explore how the

software program's impact may vary in different cultural and teaching contexts, extending beyond the Iranian educational landscape. Moreover, considering the varying levels of technology proficiency among teachers, research focusses on how technology skills influence their experience with the software and its impact on autonomy and creativity would be highly relevant. Lastly, ethical considerations should not be overlooked, necessitating research into the ethical implications of integrating technology like the Online Stoodle Software Program into the classroom. Addressing issues such as data privacy and security is crucial in our increasingly digital educational environments. These five areas collectively contribute to a comprehensive understanding of the software program's impact and its potential to enhance teaching practices and student outcomes across diverse educational settings.

Acknowledgements

The authors would like to thank all participants.

Author contributions

OS conceptualized the study. OT and HS, and M MdY confirmed the conceptualization. O S collected and analyzed the data. All authors read the manuscript and agreed with the publication.

Funding

Funding is not applicable.

Data availability

The authors declare that the data would be available at the editors' request from the corresponding author (omidsalmanpour7@gmail.com).

Declarations

Ethical approval and consent to participate

The authors declare that all authors filled in the consent form and willingly participated in the study. The ethical committee of Najafabad Branch of Islamic Azad University confirmed that this study was conducted based on the guidelines and principles of this institute. The written informed consent from all participants was taken.

Competing interests

The authors declare no conflict of interest.

Received: 10 August 2023 Accepted: 2 November 2023

Published online: 08 February 2024

References

- Allen, E., & Seaman, J. (2011). Going the distance. *Online Education in the United States*, 4, 1–39.
- Allford, D., & Pachler, N. (2007). *Language, autonomy and the new learning environments*. Peter Lang.
- Ally, M. (2004). Foundations of educational theory for online learning. *Theory and Practice of Online Learning*, 2, 15–44.
- Antecol, H., Eren, O., & Ozbeklik, S. (2015). The effect of teacher gender on student achievement in primary school. *Journal of Labor Economics*, 33(1), 63–89.
- Aoki, N. (2000). Affect and the role of teacher in the development of learner autonomy. In J. Arnold (Ed.), *Affect in language learning* (pp. 142–154). Foreign Language Teaching and Research Press.
- Aryee, A. A. (2007). Environmental information systems and community-based resource management in Ghana: An investigation of institutional policy and implementation in context.
- Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *MIS Quarterly*, 35(4), 831–858.
- Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work Stress*, 22, 187–200. <https://doi.org/10.1080/02678370802393649>
- Benson, P. (2001). *Teaching and researching autonomy in language learning*. Longman.
- Benson, P. (2004). Learner autonomy in the classroom. In D. Nunan (Ed.), *Practical English language teaching* (pp. 290–308). Higher Education Press.
- Boden, M. (2001). Creativity and knowledge. *Creativity in Education*, 1, 95–102.
- Brosh, H. (1996). Hebrew language diffusion through schools and universities in America. *Journal of Jewish Education*, 62(3), 13–20.
- Burton, P. (2010). Creativity in Hong Kong schools. *World Englishes*, 29(4), 493–507.
- Canh, L. V. (2014). Great expectations: The TESOL practicum as a professional learning experience. *Tesol Journal*, 5(2), 199–224.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1(2), 245–276.

- Charaya, A., Bana, V., & Malhotra, R. (2017). Impact of ICT on creativity and achievement ability of perspective teachers and students of technical education. *International Journal on Arts, Management and Humanities*, 6(2), 15–22.
- Chu, W., & Liu, H. (2022). A mixed-methods study on senior high school EFL teacher resilience in China. *Frontiers in Psychology*, 13, 865599.
- Çimen, S. S. (2022). Exploring EFL assessment in Turkey: curriculum and teacher practices. *International Online Journal of Education and Teaching*, 9(1), 531–550.
- Cordes, C., & Miller, E. (2000). *Fool's gold: A critical look at computers in childhood*. College Park: Alliance for Childhood.
- Cropley, D., & Cropley, A. (2010). Recognizing and fostering creativity in technological design education. *International Journal of Technology and Design Education*, 20, 345–358.
- Curras-Perez, R., Ruiz-Mafe, C., & Sanz-Blas, S. (2014). Determinants of user behaviour and recommendation in social networks: An integrative approach from the uses and gratifications perspective. *Industrial Management & Data Systems*, 114(9), 1477–1498.
- Dam, L. (1995). *From theory to classroom practice*. Authentik.
- Dee, T. S. (2006). The why chromosome: How a teacher's gender affects boys and girls. *Education Next*, 6(4), 68–76.
- Diyan, R. O., & Adediwura, A. A. (2016). Development of a rating scale for measuring teacher classroom autonomy in secondary schools in southwestern Nigeria. *International Journal of Education and Practice*, 4(4), 134–147.
- Feenberg, A. (1998). The written world: On the theory and practice of computer conferencing. In R. Mason & A. Kaye (Eds.), *Mindweave: Communication, computers, and distance education*. Oxford: Permagon Press.
- Francis, A. M., & Tannuri-Pianto, M. (2012). The redistributive equity of affirmative action: Exploring the role of race, socio-economic status, and gender in college admissions. *Economics of Education Review*, 31(1), 45–55.
- Gülbahar, B. (2017). The relationship between work engagement and organizational trust: A study of elementary school teachers in Turkey. *Journal of Education and Training Studies*, 5(2), 149–159.
- Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Schol. Psychol.*, 43, 495–513. <https://doi.org/10.1016/j.jsp.2005.11.001>
- Hew, K. F., Cheung, W. S., & Ng, C. S. I. (2010). Student contribution in asynchronous online discussion: A review of the research and empirical exploration. *Instructional Science*, 38(6), 571–606.
- Jin, L., & Deifell, E. (2013). Foreign language learners use and perception of online dictionaries: A survey study. *Journal of Online Learning and Teaching*, 9(4), 515–533.
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20, 141–151.
- Kourieos, S., & Evripidou, D. (2013). Students' perceptions of effective EFL teachers in university settings in Cyprus. *English Language Teaching*, 6(11), 1–16.
- Lamb, T. (2000). Learner autonomy, teacher autonomy: Future directions. In B. Sinclair, I. McGrath, & T. Lamb (Eds.), *Learner autonomy, teacher autonomy: Future directions* (pp. 130–144). Harlow, England: Pearson Education.
- Lavin, A., Korte, L., & Davies, T. (2012). Student gender and perceptions of teaching effectiveness. *Research in Higher Education Journal*, 18.
- Little, D. (1991). *Learner autonomy: Definitions, issues and problems*. Dublin: Authentik.
- Long, H. (2014). An empirical review of research methodologies and methods in creativity studies (2003–2012). *Creativity Research Journal*, 26(4), 427–438.
- Loveless, A. (2002). *A literature review in creativity, new technologies and learning: A report for NESTA Futurelab*. Bristol: NESTA Futurelab. <http://www.nestafuturelab.org.uk>.
- Loveless, A. (2007). Creativity, technology and learning – A review of recent literature, No. 4 update. http://archive.futurelab.org.uk/resources/documents/lit_reviews/Creativity_Review_update.pdf
- Manjari, S. (2005). Gender issues in the language arts classroom. *Eric Digest*. Bloomington, IN.
- Mostafavi, H., Yoosefee, S., Seyyedi, S. A., Rahimi, M., & Heidari, M. (2020). The impact of educational motivation and self-acceptance on creativity among high school students. *Creativity Research Journal*, 32(4), 378–382.
- Park, S., Lee, S. Y., Oliver, J. S., & Cramond, B. (2006). Changes in Korean science teachers' perceptions of creativity and science teaching after participating in an overseas professional development program. *Journal of Science Teacher Education*, 17, 37–64.
- Pishghadam, R., Baghaei, P., & Shayesteh, S. (2012). Construction and validation of an English language teacher creativity scale (ELT-CS). *Journal of American Science*, 8(3), 497–508.
- Prensky, M. (2001). Digital natives, digital immigrants' part 1. *On the Horizon*, 9(5), 1–6. <https://doi.org/10.1108/10748120110424816>
- Quinn, A., & Phillips, A. (2010). Online synchronous technologies for employee-and client-related activities in rural communities. *Journal of Technology in Human Services*, 28(4), 240–251.
- Rahimi, M., & Soryani, M. (2014). The relationship between EFL teachers' critical thinking skills and vocabulary learning strategy instruction across gender. *International Journal of Applied Linguistics and English Literature*, 3(1), 107–114.
- Reinders, H., & Darasawang, P. (2012). Diversity in learner support. *Computer-Assisted Language Learning: Diversity in Research and Practice*, 2, 49–70.
- Resnick, M. (2008). Sowing the seeds for a more creative society. *Learning & Leading with Technology*, 35(4), 18–22.
- Richardson, J., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *JALN*, 7(1), 68–88.
- Ritter, C., Polnick, B., Fin, R., & Oescher, J. (2010). Classroom learning communities in education leadership: A comparison study of three delivery options. *Internet and Higher Education*, 13, 96–100.
- Jiménez, R. M., & Lamb, T. (Eds.). (2008). *Pedagogy for autonomy in modern languages education: Theory, practice, and teacher education*. Dublin: Authentik.
- Runco, M. A. (2007). *Creativity. Theories and themes: Research, development, and practice*. San Diego: Academic Press.
- Runco, M. A. (2004). Creativity. *Annual Review of Psychology*, 55, 657–687.
- Runco, M. A., & Jaeger, G. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92–96.
- Rybakowski, J., Klonowska, P., Patrzala, A., & Jaracz, J. (2008). Psychopathology and creativity. *Archives of Psychiatry and Psychotherapy*, 1(1), 37–47.

- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25, 293–315.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66, 701–716.
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *J. Happin. Stud.*, 3, 71–92. <https://doi.org/10.1023/A:1015630930326>
- Scott, L., & Denning, D. E. (2003). A location-based encryption technique and some of its applications. In *Proceedings of the 2003 national technical meeting of the institute of navigation* (pp. 734–740).
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychological Association*, 5(1), 5.
- Smith, R. C. (2000). Starting with ourselves: Teacher-learner autonomy in language learning. In B. Sinclair, I. McGrath, & T. Lamb (Eds.), *Learner autonomy, teacher autonomy: Future directions* (pp. 89–99). Harlow, England: Pearson Education.
- Spector, J. M. (2006). *Finding your online voice: Stories told by experienced online educators*. Lawrence Erlbaum Associates.
- Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. Free press.
- Syvänen, A., Mäkinen, J. P., Syrjä, S., Heikkilä-Tammi, K., & Viteli, J. (2016). When does the educational use of ICT become a source of technostress for Finnish teachers?. In *Seminar Net*, 12, 2.
- Thys, E., Sabbe, B., & De Hert, M. (2013). Creativity and psychiatric illness: The search for a missing link-an historical context for current research. *Psychopathology*, 46(3), 136–144.
- Van Wingerden, J., Derks, D., & Bakker, A. B. (2017). The impact of personal resources and job crafting interventions on work engagement and performance. *Human Resource Management*, 56(1), 51–67.
- Ventura, M., Salanova, M., & Llorens, S. (2015). Professional self-efficacy as a predictor of burnout and engagement: The role of challenge and hindrance demands. *The Journal of Psychology: Interdisciplinary and Applied*, 149(3), 277–302. <https://doi.org/10.1080/00223980.2013.876380>.
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the job demands-resources model. *International Journal of Stress Management*, 14(2), 121.
- Zheng, J., & Jakiela, M. J. (2009). An investigation of the productivity difference in mechanical embodiment design between face-to-face and threaded online collaboration. In *International design engineering technical conferences and computers and information in engineering conference* (Vol. 48999, pp. 1173–1182).

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)
