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Original Article

The Effects of Using Educational GIFs to Teach the Continuity of Progressive Tenses to the EFL Learners

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Abstract

Abdelaziz and Zehmi (2020) reported that "pictures, videos and PowerPoint presentations with interactive practice activities served as motivating and stimulating factors in delivering the lessons" (p.16). To examine other potentials of visual tools, we used animated educational GIFs (graphics interchange format) as the educational intervention based on strategies suggested by the computer-assisted nonlinear dynamic approach (CANDA) to test their efficacy in developing learners' grammatical proficiency. To this end, mixed methods research was used to concurrently triangulate different strands of data on the effects of educational GIFs on grammatical proficiency among randomly sampled adolescent and adult participants. The interpretations were made based on methodological triangulation of QUAN + QUAL data and running one-way ANOAV. Pedagogical implication of the study confirms the efficacy of animated educational GIFs as a tool to enhance learners' grammatical proficiency in mastering progressive tenses (present, past, and future).

Keywords

grammatical proficiency; computer-assisted nonlinear dynamic approach (CANDA); communicative skills; psychological factors; graphic interchange files (GIFs).

Introduction

Teaching grammar is a fundamental aspect of foreign language learning, as it helps learners comprehend and produce accurate language structures. Over the years, educators and researchers have conducted numerous studies to explore effective strategies, techniques, and methods for teaching grammar to foreign language learners. The findings of relevant studies delineate a number of most effective approaches to teaching grammar in a foreign language setting. They have emphasized coherent and meaningful contexts and meaningful exposure to language input through using authentic materials (Nagaratnam & Al-Mekhlafi, 2013). Moreover, they highlighted integrating grammar instruction with meaningful communication in the target language (Myhill, 2014). Additionally, explicit grammar instruction also has been encouraged. Furthermore, EFL teachers were constantly advised to consider their accurate and timely feedback along with peer feedback and self-correction (Chong, 2019). Likewise, the previous research informed teachers about the role of individual differences so that they can take care of learners' varying needs, preferences, and learning styles (schenck, 2017). Meanwhile, the advent of technology has transformed language learning and offers various tools and applications that can enhance grammar instruction. Interactive multimedia resources, including grammar games, online exercises, and mobile applications, engage learners and make grammar learning entertaining (Bahari & Gholami, 2022). Virtual reality and augmented reality may provide additional immersion and contextualization opportunities in the future.

Teaching grammar to foreign language learners is multi-faceted and requires a balanced, learner-centered approach that integrates contextualized input, meaningful communication, explicit instruction, error correction, and the integration of multimedia resources. Efficient grammar

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instruction engages learners actively, promotes accuracy, facilitates communication, and fosters autonomy. Further research should continue to explore innovative strategies for addressing the complexities of grammar instruction in foreign language classrooms.

Inspired by such an outlook to grammar instruction, the present study set to examine the effect of using a well-framed grammar instruction method using multimedia on grammar learning of EFL learners. Among the available frameworks of grammar instruction, computer-assisted non-linear dynamic approach (CANDA) to grammar instruction was selected due to the fact that, above all, it is specifically developed for language teaching. Moreover, it can serve to several key strategies mentioned above, especially, contextualization, authentic language use, meaningful input, individual differences, and multi-media use.

Within this frame, different multimedia tools are applicable. Innovatively, this study invested on using GIFs as a means of communicating messages. The rationale behind that was the fact that they are available in almost all multimedia settings, they are commonly used by the majority of multimedia users, especially digital natives, and they are not so open-to-interpretation that the learners feel confused.

Overall, this empirical study provides insights to application of less attended multimedia tools, i.e. GIFs, for grammar instruction within a recent innovative instructional framework, CANDA. That is, the findings of the study are insightful for the teachers and material developers so that they are encouraged to offer and apply this method of instruction in their classes. In other words, this research attempt provided concrete evidence on how multimedia use within a well-defined framework can help teachers integrate the pillars of grammar instruction.

Grammatical Proficiency

Learning grammar by technology-assisted tools and devices began around the 1960s (Heift & Vyatkina, 2017) and since then technology-assisted language learning (TALL) has introduced a variety of affordances. TALL has facilitated learning different grammatical aspects (e.g. rule formation, grammar usage, etc.; Fang, et al., 2021) by different platforms such as computer, mobile, etc. Grammar knowledge as one of the main aspects of linguistic knowledge has attracted different scholars to integrate emerging technologies into TALL studies and has been "the center of attention of CALL researchers and developers since the very beginning of the discipline" (Kılıckaya, 2013, p.3).

Computer assisted grammar learning provides a wide range of affordances that are reportedly effective in developing grammatical proficiency (AbuSeileek, 2009; Alharbi, 2020; Baturay et al., 2010; Cowan et al., 2014). Among the reported affordances are feedback-generating systems, interactive web-based grammar learning, collaborative grammar learning, morphological analyzers, spell checkers, online dictionaries, corpora and data-driven grammar learning (Dikli & Bleyle, 2014; Hamel, 2010; Heift, 2010; Kennedy & Miceli 2010; Kılıckaya, 2019; Li et al., 2017; Reppen, 2010; Romeo, 2009; Romer, 2011; Torlakovic & Deugo, 2004; Vyatkina, 2016a, 2016b; Wood, 2011).

Mobile-assisted grammar learning has reportedly developed learners' grammatical proficiency (Chen, et al., 2019; Cornillie et al., 2018; Dehghanzadeh et al., 2019; Kayapinar et al., 2019; Sung et al., 2015; Thompson & von Gillern, 2020; Wu & Huang, 2017; Zhang & Zou, 2020). Among the reported affordances are enhanced motivation via gamification, enhanced awareness of grammatical structures, offering more diverse grammar learning activities, and Integrated Moodle e-Learning System (Hong et al., 2020; Jung, 2020; Lai, 2016; Rachels & Rockinson-Szapkiw, 2018).

Virtual Virtual reality environment as an emerging educational technology platform integrated into TALL also offers affordances that reportedly facilitate grammar learning. Among them is dynamic devices and spaces, linguistic and physical copresence that improves learner autonomy and reduces affective filters by creating persistent records and some degree of avatar control

(Bikowski, 2018; Chen, 2020; Henderson et al., 2018). Chen (2016) reported that "Results show that students improved their phonological, morphological, grammar and syntax knowledge, and virtual world learning assisted in the development of a more complex and higher level of thinking" (p.1).

Graphic Interchange Files (GIFs)

Animated GIF refers to a kind of picture that displays a sequence of frames and conveys a feeling of motion (Bulbul & Ilgun, 2015). The rationale behind using animated educational GIFs to teach continuity in present, past, and future tenses lies in the fact that animated images reportedly facilitate materializing abstract concepts (Tversky et al., 2002). Educational GIFs enhances learners in learning process as they are usually used to convey emotions (e.g. sadness, happiness, anger, etc.) through multimodal didactic resources (Altintas et al., 2017). Educational GIFs positively enhance critical thinking and learner awareness as they promote learners to make interpretations concerning their intended message/meaning (Bahari, 2021b).

Therefore, the present study employed animated educational GIFs to materialize the concept of continuity by using images to signal the continuity of the action. Learners were confronted with images that repeated continually and enabled learners to form an image of the continuity of the action in their minds and have a better and clearer understanding of progressive tenses.

Computer Assisted Nonlinear Dynamic Approach (CANDA)

The CANDA was adopted in the present study as it was originally developed based on multiple theoretical bases by Bahari (2020a). The CANDA aims at catering to the nonlinearity and dynamicity of individual learner differences by integrating emerging educational tools and affordances at individual learner regardless of diversity of learning styles and preferences among the learner group (see Bahari, 2020a). In keeping with the CANDA, psychological factors of individual learners were considered in using animated educational GIFs as the treatment. To this end, educational GIFs were selected and modified based on individual learners' opinions. Hence, participants played significant role in selecting images and converting them into animated GIFs to reflect continuity of the action at three levels: present, past, and future progressive tense.

Statement of Problem

Dynamic images can reportedly (Bikowski, 2018) facilitate teaching but they have scarcely been examined in second language learning studies. Examining the potentials of dynamic images in enhancing presentation of radiology exams, Talati et al. (2020) reported that "Dynamic images can be shared electronically to facilitate teaching, case review, presentation, and sharing of interesting cases to be viewed in detail on a computer or mobile devices for education" (p.1). Despite, the aforementioned affordance of dynamic images in teaching, applied linguistics as an interdisciplinary field has failed to apply it in language teaching in general and technology-assisted language learning (TALL) in particular. Therefore, the problem remains to be addressed whether graphic interchange files (GIFs) are facilitative tools in language learning in general and developing grammar proficiency among adolescent and adult EFL learners in particular.

To bridge this gap and to integrate an emerging educational technology into TALL, the present study examined the potentials of animated GIFs via PowerPoint presentations as a pedagogical tool in developing grammar proficiency. The findings of a pilot study conducted by the authors confirmed the potentials of animated GIFS in facilitating grammar instruction. This justified the need to replicate and expand the study. To expand this in-the-class experience and to test its practicality and generalizability, a methodological mixed methods research was conducted with a focus on the efficacy of animated GIFS in developing grammatical proficiency in terms of mastering present, past, and future progressive tenses.

Statement of Purpose

Grammar learning with 3.5% has been among the most frequently researched topics in computer-assisted language learning studies (Gillespie, 2020). However, despite receiving a lot of attention on the part of the scholars, the possible effects of animated GIFs on grammar learning has received a paucity of research. The present study aimed at overcoming this challenge and responding to the call upon the integration of emerging educational technologies to solve language-learning-related problems (Bahari, 2019a, 2020a; Bahari et al., 2021a; Hjetland, et al. (2020). To this end, the study addressed the following research questions:

RQ1: Do adolescent and adult EFL learners that engage with treatment based on the CANDA attain improvements in the grammatical proficiency that are greater than those who do not engage with the same treatment?

RQ2: What commonalities and differences can be observed in adolescent and adult EFL learners' attitude toward the efficacy of the treatment based on QUAN-QUAL data analysis?

RQ3: What interpretations can be made by triangulating the quantitative results that reflect possible pre-post treatment differences with the qualitative results that reflect adolescent and adult EFL learners' responses to the questionnaires and interviews?

Method

Participants and setting

To examine the efficacy of educational GIFs in developing grammatical proficiency, 132 EFL learners were randomly assigned into four groups (see Figure 1). Two experimental groups (34 adolescents learners = aged between13-19 and 36 adult learners = aged 19 +) and two control groups (32 adolescents learners = 13-19 and 30 adults learners = aged 19 +) voluntarily participated in the present study. The participants were elementary EFL learners who had passed online beginner course (level 3) and registered for online elementary course (level 1) that was administered by a private language school in Tehran.

Figure 1.

Visual Representation of the Procedure to Test the Effects of Educational GIFs

<Please insert Figure 1 here>

Instruments

Experimental groups received animated educational GIFs-based treatment at three levels (see Appendix C) and based on strategies outlined in the CANDA at two levels of psychological factors and communicative skills (see Bahari, 2020b). Control group did not receive any treatment and they observed the ordinary schedule of the intermediate EFL classes planned by the private language school where the study was carried out.

To measure the grammatical proficiency of the participants (both experimental and control groups), a standardized grammar test was administered before and after the educational intervention. The test consists of three sections using multiple-choice format items to test grammatical proficiency of the participants in terms of present progressive = 25 items, past progressive = 25 items, and future progressive = 25 items. Sixty minutes were allotted to answer the questions. The internal consistency of the test was measured by Cronbach's Alpha confirmed the reliability and consistency of the test at .88 in keeping with Zumbo and Chan (2014).

To collect the required data concerning the participants' attitudes about the efficacy of the treatment, the animated educational GIFs questionnaire was prepared (see Appendix A). It is a 9-item survey developed to elicit respondents' opinions at three levels of present, past, and future progressive tenses. The items were rated along a 6-step Likert continuum (1 = strongly agree to 6 = strongly disagree). Answering the questionnaire takes about 10–15 minutes. The first three aspects of the survey measures learners' perception of the efficacy of the animated educational

GIFs in developing present progressive tense (a=.84). The second three aspects of the survey measures learners' perception of the animated educational GIFs in developing past progressive tense (a=.79).The third three aspects of the survey measure learners' perception of the animated educational GIFs in developing future progressive tense (a=.74). The subscales were subjected to a reliability test to measure the internal consistency and the results confirmed reasonable reliability that ranged between .74 and .84 (see Table 1).

Table 1. Reliabilities for the animated educational GIFs Questionnaire's Subscales

Subscale	N of Items	Reliability
Present progressive tense	3	.84
Past progressive tense	3	.79
Future progressive tense	3	.74

To collect the required data about the strengths and weaknesses of the administered educational intervention, online interview was conducted by a 3-item survey among 70 experimental participants (see Appendix B). To quantify the elicited responses, the elicited responses were rated and categorized into 3 response types: Yes=1, No=2, undecided=3. The subscales were subjected to a reliability test to measure the internal consistency that resulted in reasonable reliabilities ranging between .80 and .83.

Table 2. Reliabilities for the educational GIFs Interview Subscales

Subscale	N of Items	Reliability
Present progressive tense	1	.82
Past progressive tense	1	.83
Future progressive tense	1	.80

Theoretical Underpinning

Drawing on subsumption learning theory as the theoretical frameworks, the present study used educational GIFs to facilitate grammar learning in terms of tenses (present, past, and future progressive). According to subsumption learning theory, text materials and visual means facilitate acquiring information (Ausubel, 2006; Corkill, 1992; Teng, 2020), therefore, animated GIFs via PowerPoint presentations were used to provide both textual and visual means to facilitate acquiring grammatical information.

Analytical Framework

Methodological triangulation of multiple data methods was used to ensure the outcome quality and scientific rigor (Bahari et al., 2021b) in response to the research questions. Animated educational GIFs-based treatment was administered based on the strategies introduced by the CANDA only among the experimental groups (adolescents group = 13-19 and adults group = 19 +). Members of the control groups (adolescents group = 13-19 and adults group = 19 +) did not receive any particular treatment and observed the usual instructional schedule without using GIFs. To ensure the validity of the research outcome the collected data strands (quantitative and qualitative data) were concurrently triangulated to make interpretations in response to the research questions. We used the methodological triangulation to compare and contrast different strands of data concurrently and analyze the data from different perspectives.

Results

Research Question 1

The results of the study confirmed that both adolescent and adult EFL learners that engaged with GIFs-based educational intervention based on the CANDA attained improvements in grammatical

proficiency that were significantly greater than those of EFL learners that did not engage with the same treatment. The results of statistical analyses are presented by comparing pre-post state of grammatical proficiency of experimental and control groups in terms of present, past, and future tenses below. Table 3 shows that the mean scores on grammatical proficiency test (GPT) of present progressive used before the GIFs-based educational intervention for both experimental and control groups (M = 26.64, SD = 3.354, and M = 26.73, SD = 3.52, respectively) were similar. However, the mean scores on GPT of present progressive used after the treatment for both experimental and control groups (M = 43.69, SD = 5.65, and M = 27.08, SD = 2.58, respectively) were different. This result confirms the efficacy of GIFs-based educational intervention in developing EFL learners' grammatical proficiency in terms of present progressive tense.

Table 3. Descriptive Statistics

	group	Mean	Std. Deviation	N
GPT Present progressive scores time 1	Experimental	26.64	3.354	70
	Control	26.73	3.526	62
GPT Present progressive scores time 2	Experimental	43.69	5.653	70
	Control	27.08	2.582	62

Table 4 shows that the mean scores on grammatical proficiency test (GPT) of past progressive tense used before the GIFs-based educational intervention for both experimental and control groups (M = 21.44, SD = 3.072, and M = 21.60, SD = 2.532, respectively) were similar. However, the mean scores on GPT of past progressive used after the treatment for both experimental and control groups (M = 36.61, SD = 3.503, and M = 21.90, SD = 2.974, respectively) were different. This result confirmed the efficacy of GIFs-based educational intervention in developing EFL learners' grammatical proficiency in terms of past progressive tense.

Table 4. Descriptive Statistics

	group	Mean	Std. Deviation	N
GPT Past progressive scores time 1	Experimental	21.44	3.072	70
	Control	21.60	2.532	62
GPT Past progressive scores time 2	Experimental	36.61	3.503	70
	Control	21.90	2.974	62

Table 5 shows that the mean scores on grammatical proficiency test (GPT) of future progressive used before the GIFs-based educational intervention for both experimental and control groups (M = 26.64, SD = 3.354, and M = 26.73, SD = 3.52, respectively) were similar. However, the mean scores on GPT of future progressive used after the treatment for both experimental and control groups (M = 43.69, SD = 5.65, and M = 27.08, SD = 2.58, respectively) were different. This result confirmed the efficacy of GIFs-based educational intervention in developing EFL learners' grammatical proficiency in terms of future progressive tense.

Table 5. Descriptive Statistics

	group	Mean	Std. Deviation	N
GPT Future progressive scores time 1	Experimental	21.59	2.331	70
	Control	21.94	1.991	62
GPT Future progressive scores time 2	Experimental	39.69	4.210	70
	Control	20.47	2.208	62

A mixed between-within-subjects analysis of variance was conducted to explore the impact of using GIFs-based educational intervention on developing grammatical proficiency. The three aspects of grammatical proficiency, present, past, and future, were measured respectively. The interaction effect between the groups or the treatment of using GIFs-based educational intervention and the time in taking grammatical proficiency test was statistically significant, Wilks' Lambda =.680, F (1, 56) = 26.307, p = .000. The effect size for the interaction effect was .320, which is a large effect size, meaning that the interaction is meaningful. Table 6 clearly displays the significance of difference between groups by producing homogeneity of variances in terms of present, past, and future progressive tenses.

Table 6. Test of Homogeneity of Variances

Test of Homogeneity of Variances				
	Levene Statistic	df1	df2	Sig.
Grammar Proficiency Test Scores (Present Progressive)	100.457	3	260	.000
Grammar Proficiency Test Scores (Past Progressive)	90.516	3	260	.000
Grammar Proficiency Test Scores (Future Progressive)	167.286	3	260	.000

Table 7 displays the results of the one-way between groups analysis of variance that was conducted to explore the efficacy of GIFs-based educational intervention on developing grammatical proficiency. According to the results there was a statistically significant difference at the p < .05 level in grammatical proficiency test scores for adolescents as well as adults. There was a significant effect of GIFs-based educational intervention on grammatical proficiency at the p < .05 level for three conditions [F (3, 26) = 27. 34, p = 0.000].

Table 7. ANOVA

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Grammar Proficiency Test Scores (Present Progressive)	Between Groups	4509.571	3	1503.190	27.342	.000
	Within Groups	14294.122	260	54.977		
	Total	18803.693	263			
Grammar Proficiency Test Scores (Past Progressive)	Between Groups	3502.604	3	1167.535	28.998	.000
	Within Groups	10468.210	260	40.262		
	Total	13970.814	263			
Grammar Proficiency Test Scores (Future Progressive)	Between Groups	5863.739	3	1954.580	37.205	.000
	Within Groups	13659.216	260	52.535		
	Total	19522.955	263			

Research Question 2

The results of both QUAN-QUAL data analyses confirm that both adolescent and adult experimental groups were common in developing grammatical proficiency compared to the control groups after receiving educational intervention by animated GIFs via PowerPoints. Triangulation of QUAN-QUAL data sources revealed that in addition to the aforementioned statistically significant differences between groups, there was a difference within groups in terms of mastery of tenses. Comparing Figures 2, 3, and 4 reveals that the biggest difference observed in the experimental groups' performance (both adolescents and adults) occurs in the mastery of the present tense posttest (M = 35.45), followed by the future progressive tense (M = 30. 83), and the past tense progressive (M = 29.25).

Figure 2
Mean of GPT-Present Progressive
<Please insert Figure 2 here>

Figure 3
Mean of GPT-Past Progressive
<Please insert Figure 3 here>

Figure 4
Mean of GPT-Future Progressive
<Please insert Figure 4 here>

Research Question 3
Triangulating QUAN-QUAL data suggest pre-post treatment differences both between and within experimental and control groups. There was an interpretive consistency between the obtained results from the aforementioned quantitative data analyses and the qualitative data analyses (see Appendixes A and B) obtained by the questionnaires and interviews. The results also suggest theoretical consistency as they are consistent with the adopted theoretical framework (i.e. subsumption learning theory) and the adopted pedagogical framework (CANDA) to administer the treatment. The triangulation of the data strands also resulted in highlighting differences in the observed effects of animated GIFs via PowerPoints informed us that they seem to be less effective at developing past progressive tense compared to present and future progressive tenses. Therefore, future studies are suggested to elaborate on this weakness of animated GIFs via PowerPoints in developing grammatical proficiency.

Discussion

Contributions to the Field

The main contribution of the present study to the field is the introduction of an emerging educational technology that can effectively facilitate developing grammatical proficiency among second language learners in terms of present, past, and future progressive tenses. Educational GIFs are suggested to be examined and used for other aspects of language learning and developing linguistic knowledge. The authors noticed that educational GIFs significantly facilitate instruction and conveying instructional messages to the learners by attracting their attention and engaging them in selecting and converting images. Computer programmers are suggested to consider developing platforms particularly designed for language learning via animated educational GIFs and accelerated the integration of this educational technology into language learning curriculum.

Implications

Despite the limitations, the main pedagogical implication of the study is the efficacy of educational GIFs in facilitating grammar learning in terms of tenses (present, past, and future progressive) among both adolescents and adults participants. Educational GIFs were effective technology-enhanced tools that not only engaged learners in developing images that increased their digital literacy, but also enhanced meaningful learning among them by generating moving images to convey the concept of continuity in progressive tenses to their peers.

Based on the elicited responses, educational GIFs increases learners' flow and enable them to process different tense types more easily. Some participants believed that the animated GIFs highlighted the continuity of the action displayed in PowerPoints (see Appendix C) and helped them conceptualize the ongoing action in order to establish a connection between the action and its continuity by visual means. The findings suggest both the development of required educational GIFs and the integration of them into TALL curriculum to benefit from the emerging educational technologies.

Replication Notes

To replicate the study, future studies are suggested to consider examining other potentials of educational GIFs. During the study, the authors noticed that animated images attracted the attention of the majority of the learners and most of them were engaged in learning process either individually or in pairs by synchronous typing/interacting. Therefore, future replication studies are suggested to examine the effects of educational GIFs on collaborative language learning and to include learners in selecting and converting images into educational GIFs as part of a collaborative learning task. The main limitation of the study was the small size of the study that could affect the reliability of the questionnaire results. Hence, future studies are suggested to include more participants to ensure generalizability of the research outcome.

Conclusion

One of the main challenges of integrating emerging educational technologies into technology-enhanced language teaching is a taxonomy of instructional designs that inform teachers about the variety of affordances that have been investigated and can be effectively adopted for teaching main and minor aspects of language teaching. The findings of the present study can be included in technology-enhanced language teaching for teaching grammar as a main aspect of language, and progressive tenses as a minor aspect of language.

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