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The Effects of Differentiated Instruction (DI) on Achievement, Motivation, and Autonomy among English Learners

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ABSTRACT

Differentiated Instruction (DI), as a single instructional technique that focuses on the challenges of meeting varied needs and qualities of learners in inclusive educational contexts, has recently attracted great attention in the field of education. The present study aims to explore the effects of differentiated instruction (DI) on foreign language achievement (FLA), foreign language motivation (FLM), and learner autonomy (LA) of English learners at a state school in Istanbul, Turkey. Additionally, the study attempts to explore how students and their teacher perceive the use of DI in English classrooms as well. The participants were 24 students and one teacher enrolled in the 8th grade (secondary level) English program at a state school in Istanbul, Turkey. The data were collected quantitatively using the Foreign Language Motivation Questionnaire, pre-and post-achievement tests, and the Learner Autonomy Scale. To complement the quantitative data, qualitative data were gathered from student interviews and teacher reflective journals. The findings demonstrated that incorporating DI enhanced the participants' overall FLA as well as FLM and LA. Both students and their teacher perceived DI to be effective and useful while studying and teaching English. Based on the obtained findings, the study provides suggestions and pedagogical implications about incorporating DI in secondary-level English classrooms.

Keywords: differentiated instruction; motivation; learner autonomy; language achievement; student perceptions; teacher reflections

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Introduction

Students differ from one another due to unique qualities, economic variations, and specific needs that may have an impact on the learning process. The diverse characteristics displayed by students make it necessary for teachers to vary their activities in their classroom practices (Bender, 2012). As classrooms are becoming more diverse, differentiated instruction is gaining importance. Differentiated instruction (DI) provides opportunities for teachers to address varieties among students such as learning style, needs, readiness level, and interest (Tomlinson, Brimijoin & Narvaez, 2008). 'Differentiation' has been used actively for almost twenty years within inclusive education whereas it was first utilized as "mixed ability teaching" in education (Westwood, 2016, p.5). Differentiation is about equating the content of the lesson with the characteristics of the students which could comprise their culture, interests, emotional traits, learning styles and modes, gender, and background knowledge (Tomlinson & Imbeau, 2013).

DI has been one of the equitable instructional methods of teaching and forming instruction by students' learning styles, readiness level, interests, needs, and language proficiency (Chien, 2012; O'Meara, 2011; Spencer-Northey, 2013). Specifically, DI considers all differences among students within the same class opposite to the one-size-fits-all approach. During the implementation of DI, four elements can be adapted; *content* (what students learn in lessons), *process* (the way the students reach the knowledge), *product* (the output showing what students learn in lessons) (Tomlinson, 2017), *affect* and *learning environment* (the learning medium in which the students have positive emotions like success, autonomy, responsibility, and support for their enhancement) (Tomlinson & Jay, 2006). Whilst DI takes the differences of the students into account by modifying the lessons (Harmani & Effendi, 2018), it aims to accelerate student achievement and improve them academically (Guay et al., 2017; Westwood, 2016).

Among the major influential factors in language classrooms is the motivation that triggers student achievement throughout the learning process (Daskalovska et al., 2012). Motivation and learning affect each other interchangeably. Namely, the level of motivation influences the learning outcome in the same direction (Harmini & Effendi, 2018). For this reason, motivation is regarded as an individual characteristic that gives direction to foreign language learning and the foreign language achievement of a learner. The improvement and implementation of a successful foreign language instruction depend upon understanding the nature of learner motivation (Tatar, 2017). While previous studies focused on the role of different types of motivation in language learning (Deci, 1975; Gardner & Lambert, 1972; Lukmani, 1972; Spolsky, 1969), recent research is mainly concerned with what is motivating for learners regarding the elements such as learner behavior, teacher behavior and the ways of motivating the learner (Alizadeh, 2016; Chalak & Kassaian, 2010; Jowkar et al., 2017; Mauludin, 2021; Zareian & Jodaei, 2015). Mauludin (2021), for example, explored the perceptions of students about the motivating teaching strategies in English for Specific Purposes (ESP) classrooms. Data were collected from 163 ESP students from a public university in Indonesia through a questionnaire addressing their perceptions on the most and the least motivational teaching strategies. The results revealed that the strategies supplying comfortable and enjoyable lessons were perceived as the most motivating strategies whereas strategies related to the activities and assignments were reflected to be the least motivational ones. In another study, Alizadeh (2016) provided a review on research on motivation in language learning reporting that the motivation of learners can go up and down depending on the context of language learning as well as the role of the teacher. Finally, Chalak and Kassaian (2010) examined the motivation orientations and attitudes of 108 Iranian students towards the target language and its community. The students were majoring in English translation at Islamic Azad University. According to the results obtained from a survey, the participants reported that they learned the language both for 'instrumental' and 'integrative' reasons. Lastly, their attitudes towards the target language community and its members were generally found to be highly positive.

Apart from motivating students during the learning process, enhancing their independence and interest in learning is another vital goal to be attained in language classrooms. It has been suggested that making the learning environment more challenging and interesting as well as providing several different learning choices makes learners feel more responsible for their learning (Clapper, 2010). When students take the responsibility for their learning, which means more student-centered lessons, their motivation, interest, and autonomy also increase (Betts, 2004; Sanacore, 2008). Fundamentally, it is intended to improve learner autonomy, and this is achieved by enabling the students to take responsibility for their learning through clear explanations of the goals, providing a learning environment with different learning styles, materials, and activities. Likewise, presenting different ways of learning and making contributions to content, process, as well as assessment, help learners become more autonomous. Thus, differentiating the learning process and medium for students provides them with the opportunities to enhance their autonomy (Convery & Coyle, 1993).

Differentiated Instruction (DI) in Education

Before 'Differentiated instruction' or 'Differentiation' was utilized as a notion, teachers started to differentiate their instruction, materials, and methods by their students' distinctive features such as background knowledge, culture, and needs (Tomlinson, 2014). The implementation of the 'Differentiated instruction (DI)' was first implemented to address the needs of gifted students (Fogarty & Pete, 2011). The number of DI studies highlighting its effects on students' perceptions has recently increased (Karadağ & Yaşar, 2010; Mok, 2012; Park, 2017; White, 2015). Karadağ and Yaşar (2010), for example, conducted a study to identify the attitudes of 30 Turkish 5th-grade students (16 girls and 14 boys). According to the results gathered from semi-structured interviews and attitude scale, the students had positive attitudes while learning English through DI. In another study, Mok (2012) explored the perceptions of undergraduate students about the usefulness of DI. In the study, four focus-group discussions and an online questionnaire were administered to 267 students. The findings reported that the participating students preferred DI activities rather than traditional activities such as fill-in-the-blank and matching. At the same time, DI increased the students' motivation while learning English. Further, White (2015) attempted to investigate the implementation of DI in a primary grade classroom (N=18) examining its effects on students' perceptions, their participation as well as learning. Data obtained from surveys, pre- and post-exams, and post-interviews revealed that students' perceptions were highly positive, and they were more active during DI-based lessons. Similarly, Park (2017) aimed to find out middle school students' perceptions and their understanding of DI in a state school in Florida. Data gathered from 10 students using surveys, face-to-face interviews, observations, and reflective notes revealed that the students were conscious of the advantages of DI, and they perceived it positively during their learning process.

Apart from the perceptions of students towards DI, the perceptions of teachers have been addressed by distinguished scholars as well (Aftab, 2015; Ballone & Czerniak, 2001; Burkett, 2013; Chien, 2015; Ismail & Allaq, 2019; Melesse, 2015; Santangelo & Tomlinson, 2012). In a recent study, Ismail and Allaq (2019) attempted to reveal the perceptions of 200 English teachers on cooperative learning and DI. The results gathered from a questionnaire and interviews stated that the teachers perceived cooperative learning and DI as effective for students' interaction as well as their participation. In a similar vein, Aftab (2015) explored the perceptions of 120 middle school teachers about the implementation of DI in their classroom practices. The data obtained from the questionnaire adapted from Ballone and Czerniak (2001) reported that teachers shared their positive views about the application of DI, and they all agreed on the need for actively applying DI in their classroom practices. In another study, Chien (2015) investigated the perceptions of elementary school English teachers about DI during a summer course. Data collected through videos, interviews, surveys, and documents revealed that the teachers gained information about

how to implement DI as they lacked knowledge about DI practices. Similarly, in a study by Melesse (2015), the perceptions, practices, and challenges of 232 primary school teachers related to DI were examined qualitatively via questionnaires, semi-structured interviews, and focus group discussions. The results demonstrated that the teachers did not have enough information about DI and its strategies which should be closely addressed by the teacher trainers and administrators. Regarding teacher demographics, female teachers applied DI better than male teachers. Besides, teachers who had majored in Language and Maths applied DI more effectively than the others. In another study, Burkett (2013) aimed to find out the teachers' perceptions on how they perceive the effects of DI on their teaching. Interviews were carried out with 11 elementary school teachers using open-ended questions and analyzed qualitatively. According to the results, teachers perceived DI to be important and expressed that the DI evolves spontaneously in their classroom. Pre- and in-service education, as well as early schooling, were also found to be effective for raising awareness of the teacher about DI. Finally, Santangelo and Tomlinson (2012), aiming to investigate teacher educators' perceptions about DI, applied a cross-sectional survey on teaching faculty (N=85) of a public university of the middle-Atlantic region in the USA. The obtained data reported that the teachers agreed on the importance of the readiness level of the students and creating more positive learning mediums via DI-based classes.

Another research area addressed by distinguished scholars was the impact of DI on student achievement (J.-H. Chen & Y.-C. Chen, 2018; Izgi, 2014; Özer & Yılmaz, 2018; Valiandes & Neophytou, 2018). J.-H. Chen and Y.-C. Chen (2018) explored the impact of DI on the achievement of 60 freshmen Army Academy students. In this quasi-experimental design, the pre- and post-tests of the two groups reported that there was a difference between them concerning their achievement level emphasizing that DI had a positive effect on student achievement. Additionally, the study conducted by Valiandes and Neophytou (2018) investigated the features of a teacher professional development program for DI and examined its influences on teachers' perceptions, attitudes, and student achievement. 14 volunteer teachers teaching Greek in the 4th-grade of an elementary school participated in the study. Data gathered from lesson observation protocols and interviews indicated that the program was successful in terms of teachers' improvement and student achievement. Another study by Özer and Yılmaz (2018) attempted to find out the impact of thinking-style-based DI on achievement, attitude, and retention of students in vocational foreign language lessons. In the quasi-experimental study, data were collected from 43 sophomores at Tourism and Hotel Management School. The process component of the lessons was differentiated through entry points, learning centers, complex instruction, orbital studies, stations, and learning contracts. An attitude test and two different achievement tests for vocational schools were used before and after the treatment. The results revealed that the achievement level of the experimental group was higher than the control group. Finally, Izgi (2014) investigated how DI affected students' academic achievement as well as explored their attitudes towards English lessons. In this quasi-experimental study, 20 5th-grade students constituted each group. The data gathered from the two groups using pre- and post- achievement tests, an attitude test, observation, and interview forms showed that implementing DI increased the academic achievement of the experimental group and their attitudes towards English lessons were highly positive.

Although there are numerous studies on DI, motivation, and autonomy, their number is still scarce (Alhashmi & Elyas, 2018; Gülşen & Mede, 2019; Betts, 2004; Houston, 2013; Meyad et. al, 2014; Sanacore, 2008). Gülşen and Mede (2019) investigated the effects of DI on reading comprehension and learner autonomy of 72 5th-grade English learners enrolled in online reading classes at a private school in Turkey. The analyses of the data gathered from pre- and post-reading tests, learner autonomy scale, student interviews, and teacher reflective journals demonstrated that the implementation of DI resulted in better comprehension skills and boosted learner autonomy. Both groups of participants perceived DI to be quite beneficial in online reading lessons. In another recent study, Alhashmi and Elyas (2018) sought to examine the effects of DI on female

learners of English as a Foreign Language (EFL) at King Abdul-Aziz University. Following a pre-test-intervention-post-test experimental design, the quantitative results reported that DI led to a significant difference between the pre-and post-test scores of the experimental group. On the contrary, no significant difference was detected between their counterparts in the control group. Finally, the qualitative results revealed that learners perceived the application of DI positively with the increased motivation, appropriateness of access, and autonomy. Meyad et. al. (2014) aimed to examine the relationship between DI and motivation among 100 secondary level Arabic learners in Malaysia. In this quasi-experimental study, the experimental group was exposed to DI depending on the Universal Design of Learning Model whereas the control group was engaged in traditional instruction. The pre-and post- questionnaire results reported that using DI accelerated the motivational level of the students in the experimental group. Houston (2013) intended to find out the relationship between academic intrinsic motivation and DI among gifted and non-gifted secondary level students. As a data collection tool, the Children's Academic Intrinsic Motivation Inventory and the Middle School Survey of Classroom Practices were utilized. Based on the gathered results, no difference was found in the motivation between the two groups. As for student autonomy, DI was considered to encourage the development of self-discovery, self-esteem, creativity, and autonomy (Betts, 2004; Sanacore, 2008).

Considering the review of previous studies, it is obvious that DI, motivation, achievement, and autonomy are notions completing each other during the teaching and learning process. DI presents learning opportunities to accelerate autonomy and motivation among learners. At the same time, learner autonomy is a strategy used in DI to provide student autonomy in learning. This study, therefore, aims to investigate the effectiveness of DI on student motivation, autonomy, and achievement in secondary level (8th grade) English classrooms. The study also attempts to explore the perceptions of students and their teacher about DI-based English classes. To meet these objectives, the following research questions were addressed:

1. What are the effects of DI on student achievement, motivation, and autonomy in 8th-grade (secondary level) English classrooms?
2. What are the perceptions of students about learning English through DI?
3. What are the perceptions of their teacher about DI-based English classes?

Methodology

Research Context

This study is based on mixed-method as a research design including both qualitative and quantitative methods to explore the effects of implementing DI in 8th-grade English classes. Specifically, a quasi-experimental research design was adopted as two intact secondary level English classes participated in the research as experimental and control groups. While the experimental group was engaged in DI-based classes, the control group followed the same content through traditional instruction for 8 weeks in total. Both groups were exposed to the 8th grade English curriculum approved by Turkey's Ministry of National Education (MoNE). Specifically, for each grade, there is only one textbook designed by MoNE and teachers are required to cover all the units during the academic year following the same yearly lesson plans provided. Thus, there is not enough time for additional activities and teachers have no flexibility to consider the differences of students in terms of readiness, interest, and learning style. As for the assessment, two English language exams based on summative assessment are implemented per semester. All exams are paper-based mainly focusing on reading and writing along with grammar and vocabulary. Listening and speaking are completely ignored due to the low number of English classes and lack of technical support.

Setting and Participants

This research was carried out at a secondary state school in Istanbul, Turkey. The participants comprised of two intact 8th-grade (secondary level) English classrooms with a total of 24 students whose ages ranged between 13 to 14 years old. The classes were divided into two groups; an experimental group (N=13 students; 7 girls and 6 boys) and a control group (N=11, 5 girls and 6 boys). The reason for choosing this grade was due to their proficiency level. In other words, the 8th-grade students were at the upper intermediate level of proficiency showing that DI could be effectively implemented to meet the students' language and learning needs. Apart from the students, one teacher teaching English to both classes took part in this study as well. She was 32 years old and had 8 years of teaching experience. She was a graduate of the Department of English Language Teaching (ELT) and had a certificate in using DI after joining a DI in-service training summer course that aimed to raise the awareness of the teachers about implementing DI in their classrooms.

Data Collection Instruments

This study is descriptive as the measure was done only once and the results were used to provide only associations among the variables (Babbie, 2010). As previously stated, the data were collected using both quantitative and qualitative instruments. Before the data collection procedure, the Visual-Auditory-Kinaesthetic (VAK) Learning Style Questionnaire (Chistlett & Chapman, 2005) was administered to explore the learning styles of the experimental group and design DI-based lesson plans accordingly. The VAK learning styles put forward three kinds of learning styles: visual, auditory, and kinaesthetic (Yılmaz et al., 2009). Visual learners learn best by seeing and reading which shows the need for visual materials such as presentations, illustrations, pictures, or maps. Auditory learners need to get information by hearing such as listening to lessons, discussing the topics, or talking about them. Kinaesthetic learners should feel or do something to be able to learn it best. They can study in labs or attend trips to gain experience physically (Surjono, 2011). For this study, the learning style questionnaire included 30 statements followed by three options; A stands for Visual, B for Auditory, and C for Kinaesthetic learners. Generally, a student may have more than one learning style. Table 1 displays the learning styles of the participants in the DI group:

Table 1
Learning Style of the DI Group

Student (S)	Learning Style (A, B, C)
(S1)	A, C
(S2)	B, C
(S3)	A, C
(S4)	B, C
(S5)	A, C
(S6)	A, C
(S7)	A, B
(S8)	B, C
(S9)	A, C
(S10)	A, B
(S11)	B, C
(S12)	A, B
(S13)	B, C

Apart from the learning style questionnaire, data were collected from pre-and post-achievement tests administered to the two groups. The achievement test was a standardized local English exam, LGS (High School Entrance exam), conducted with 8th-grade students in Turkey every year. The two tests comprised 20 multiple-choice items given to the student before and after the treatment (DI-based lessons). The tests measured the reading and writing skills as well as grammar and vocabulary which were included in the 8th-grade MoNE curriculum and

coursebook. The duration of both exams was 45 minutes. Additionally, the Turkish version of Foreign Language Motivation Questionnaire (FLMQ) translated by Uçar (2009) and the Learner Autonomy Scale (LAS) developed by Orakçı and Gelişli (2017) were administered to the experimental group before and after DI to examine its effects on students' motivation and their autonomy level. The FLMQ included 56 items whereas the LAS comprised 14 items in total. The two scales were based on a four-point Likert type scale ranging from "strongly disagree (1)" to "strongly agree (4)". In addition, qualitative data were gathered via student semi-structured interviews and a teacher reflective journal to gain a better understanding of their perspectives on learning and practicing English through DI. The student interviews were carried out in Turkish. The questions were adapted from Golnaz's (2019) study that explored students' experiences about learning and DI-based classes.

Before the data collection procedure, the reliability measurements were calculated for each scale. Specifically, VAK, LAS, and FLMQ were piloted with 36 randomly selected 8th-grade students at the same school. The Cronbach's Alpha was found as .80 for VAK, .80 for LAS, and .88 for FLMQ indicating high reliability. As the language achievement test was a standardized language test prepared by experts officially assigned by MoNE, it was accepted as reliable. A consent form was officially received from MoNE for the ethical issues.

Data collection procedure

In this quasi-experimental study, two intact groups (experimental vs control) were exposed to DI and traditional instruction. Table 2 illustrates the implementation process of the two groups:

Table 2
The Implementation Process of the Two Groups

WEEK	The control group	The experimental group
Week 1		-Introduction to the study -Introducing Unit Friendship -learning the structures of <i>making invitation-offers, accepting and refusing</i>
Week 2		-Writing an invitation card -Doing the exercises.
Week 3		-Introducing the grammar structure 'Be going to'
Week 4	-Completing the unit -Pre-achievement test.	-Completing the unit. -Applying the visual-auditory-kinesthetic (VAK) learning style questionnaire, KWL chart, Pre-achievement test, pre-LAS, and pre-FLMQ.
Week 5	- Unit 2 'Teen Life'	-Modifying classroom to DI. -Unit 2 'Teen Life' via Quizlet. -Setting learning centers and doing activities. - Doing a tiered activity as level-based. -Writing reflective journal.
Week 6	-Completing the related pages in the textbook.	- Simple Present Tense by using slights. -Doing a tiered activity. -Learning centers according to learning styles. -Delivering Think-Tac-Toe chart as an assignment. -Writing Reflective journal.
Week 7	-Explaining the usage of 'Prefer-Like-Dislike' in TCI. -Doing the activities in the textbook.	- Telling 'Prefer-Like-Dislike' via slights and her mimics and gestures. - 'I've got it' card game and hot-seats (Blaz, 2006) activity. -Learning centers activity as skill-based. -Writing reflective journal.
Week 8	-Post-achievement test.	- Post-achievement test, the post-LAS, post-FLMQ, and semi-structured interview with the students.

Data analysis

This study utilized both quantitative and qualitative data collection instruments to gather in-depth and reliable data. The quantitative data obtained from the FLMQ, LAS, and achievement tests were analyzed through SPSS 28. Due to the low sample size ($N=24$), non-parametric tests were run to analyze the gathered data. To compare pre-and post-achievement tests, Mann-Whitney U and Wilcoxon Signed Ranked tests were run. Specifically, the Mann-Whitney U test was utilized to

examine the differences between control and experimental groups after the implementation procedure whereas the Wilcoxon Signed Ranked test was used to identify the effects of DI within the experimental group. As for the pre-and post- LA scale and pre-and post- FLMQ, merely Wilcoxon Signed Ranked test was utilized to examine the differences between the two groups.

As for the qualitative aspect of this study, data gathered from student semi-structured interviews and teacher reflective journals went through content analysis (Dinçer, 2018). The two researchers who were experts in the field of language education went through the data inductively using open coding and grouped similar or repeated utterances under the same themes. The inter-rater reliability was found to be .80 showing agreement between the two raters.

Results

The Effects of DI on Student FLA

As reported in Table 3, the mean score of the experimental group increased from 38.46 to 48.08 whereas the mean score of the control group reached 38.64 from 36.73. While the pre-test mean scores of both groups were close to each other (Experimental: 38.46, Control: 36.72), the difference between their post-test mean scores increased (Experimental: 48.08, Control: 38.64) after the implementation of the treatment. Finally, the minimum score of the control group decreased by 10 from 12 while the minimum score of the experimental group rose to 15 from 4 following the treatment.

Table 3
Descriptives of the Two Groups Related to FLA

	FLA	N	M	Mdn.	SD	Min.	Max.
Experimental	Pre-FLA	13	38.46	28.00	26.00	4	92
Control	Pre-FLA	11	36.73	32.00	20.53	12	88
Experimental	Post-FLA	13	48.08	50.00	22.41	15	95
Control	Post-FLA	11	38.64	35.00	18.98	10	85

Additionally, no significant difference was found between pre-and post-test scores of the two groups ($p = .749 > .05$, $p = .108 > .05$). However, the difference between the two groups decreased and got close to the ideal score after the DI-based classes, indicating that DI affected the students' achievement scores (See Table 4).

Table 4
The Differences between the Two Groups Related to FLA

FLA		N	Mean Rank	Sum of Ranks	U	Z	P
Pre-FLA	Experimental	13	12.08	157.00	66.00	-.320	.749
	Control	11	13.00	143.00			
Post-FLA	Experimental	13	14.62	190.00	44.00	-1.609	.108
	Control	11	10.00	110.00			

Finally, while there was no significant difference between the pre-and post-test scores of the control group ($z=-.089$, $p=.929>.05$), a statistically significant difference was detected between pre-and post-test scores of the experimental group related to FLA ($z=-2.342$, $p=.019<.05$) (See Table 5).

Table 5
The Differences within the two Groups Related to FLA

	FLA	Negative Ranks	Positive Ranks	z	Sig.
Experimental	Pre-FLA	2 ^a	11 ^b	-2.342	.019
	Post-FLA				
Control	Pre-FLA	7 ^a	4 ^b	-.089	.929
	Post-FLA				

$p>.05$

The Effects of DI on Student FLM

According to the mean scores of the two groups of participants, the experimental group was more motivated (M: 3.58, SD: .87) compared to the control group (M: 3.43, SD: .85) which showed only a slight improvement in their motivation (See Table 6).

Table 6
Descriptives of the Two Groups Related to FLM

	FLM	N	M	SD	Mdn.	Min.	Max.
Experimental	Pre-FLM	13	3.18	.58	3.25	2.10	3.90
Control	Pre-FLM	11	3.42	.56	3.60	2.70	4.00
Experimental	Post-FLM	13	3.58	.87	3.45	1.80	4.90
Control	Post-FLM	11	3.43	.85	3.25	2.30	5.00

As for the differences between the two groups concerning FLM, the analyses of the Wilcoxon Signed Rank Test revealed a statistically significant difference between the pre-and post- scores of the experimental group ($z=-10.00$, $p=.005<.05$). However, no difference was detected in the control group ($z=.09$, $p=.911>.05$) (See Table 7).

Table 7
The Differences within the Two Groups Related to FLM

	FLM	Negative Ranks	Positive Ranks	z	p
Experimental	Pre-FLM	2 ^a	11 ^b	-10.00	.005*
	Post-FLM				
Control	Pre-FLM	7 ^a	4 ^b	-.09	.911
	Post-FLM				

* $p<.05$

Regarding the effects of DI on LA, the results reported that the experimental group was more autonomous after being exposed to DI (M:3.71, SD: .58) whereas the control group had a slight increase (M: 2.85, SD: 1.26).

Table 8
Descriptives of the Two Groups Related to LA

	LA	N	M	SD	Mdn.	Min.	Max.
Experimental	Pre-LA	13	3.13	.90	3.33	1.33	5.00
Control	Pre-LA	11	2.81	1.17	2.50	2.70	5.00
Experimental	Post-LA	13	3.71	.58	3.67	1.00	5.00
Control	Post-LA	11	2.85	1.26	2.67	1.00	5.00

When the two groups were compared, a statistically significant difference was detected between the pre-and post- scores of the experimental group ($z=-2.75$, $p=.006<.05$) whereas no difference was found in the control group ($z=.00$, $p=.1.000>.05$) (See Table 9).

Table 9
Comparison of the Two Groups Related to LA

		Negative Ranks	Positive Ranks	z	p
Experimental	Pre-LA Post-LA	2 ^a	11 ^b	-2.75	.006*
Control	Pre-LA Post-LA	7 ^a	4 ^b	.00	1.000

* $p<.05$

Student Perceptions about DI-based English Classes

Apart from the quantitative analyses, semi-structured interviews were carried out with the students in the experimental group to find out their perception of DI. As a result of content analysis, the student perceptions were categorized under four themes namely, positive attitudes towards DI-based classes, motivating aspect of DI, peer relationship, and being autonomous.

To begin with, the students exposed to DI-based classes expressed their positive attitudes stating that they had more fun during the lessons and felt more relaxed. Considering this finding, they shared the following viewpoints:

[...] I think I have more fun during the lessons now. I feel relaxed and enjoy learning English. (S10, Semi-structured interview, 10.11.2020)

[...] I can describe the DI lessons as relaxing and enjoyable. To be honest, I have never felt anything negative. (S2, Semi-structured interview, 09.11.2020)

In addition, the participating students emphasized the concept of motivation. They stated that they felt more motivated during the lessons as illustrated in the following excerpts:

[...] I feel more motivated. The activities are more enjoyable and motivating. (S2, Semi-structured interview, 09.11.2020)

[...] Feeling motivated affected my learning positively in these lessons. I enjoy them. (S9, Semi-structured interview, 10.11.2020)

After being engaged in DI-based classes, the students emphasized the role of their peers as well. They indicated that they had a more intimate and positive relationship with their peers. Considering this finding, they said:

[...] I learned both to have fun and work with my classmates. I enjoy working with my peers. (S7, Semi-structured interview, 10.11.2020)

[...] My classmates motivate and help me during the activities. We learn from each other, and I am quite positive about collaborating with my peers. (S9, Semi-structured interview, 10.11.2020)

Finally, the students revealed that they felt more independent and comfortable. They were willing to take more responsibilities which helped them become more autonomous. This finding was supported by these two comments:

[...] I take more responsibilities. Thus, I feel more comfortable and independent. (S9, Semi-structured interview, 10.11.2020)

[...] I take responsibility and feel relaxed. I feel more independent. (S3, Semi-structured interview, 09.11.2020)

Teacher Reflections about DI-based English Classes

As for the teacher's reflections about using DI in English classes, four common themes emerged from the content analysis: improving student autonomy, eagerness towards the lesson, student enjoyment, and student collaboration. First, with the help of extracted statements, the participating teacher stated DI provided students with the opportunities to take more responsibility for their learning and act more independently. Considering the positive influence of DI on students' autonomy, the teacher expressed this viewpoint:

[...] The students are more active in DI lessons. They participate more and take more responsibilities. (T, Reflective Journal, 24.10.2020)

The teacher also emphasized that the students were more interested in the lesson, and they also had fun while learning as illustrated in this comment:

[...] When I entered the classroom, the students inmodestly asked about the DI activities. Their interest really increased. (T, Reflective Journal, 31.10.2020)

[...] The students have fun, and they enjoy the lessons. They love DI activities.

(T, Reflective Journal, 31.10.2020)

Finally, similar to the students' perceptions, the teacher indicated that the student collaboration and interaction with their peers increased after being exposed to DI. They collaborated and learned together as expressed in this excerpt:

[...] The students worked together and collaborated during the lesson. They learned from each other and had fun. (T, Reflective Journal, 24.10.2020)

Discussion

The present study aimed to examine the effects of DI on FLA, FLM, and LA among secondary level (8th grade) English learners. The study also investigated the perceptions of students and their teacher about learning and teaching English through DI-based classes. First, based on the pre-and post-test results, the FLA scores of both the experimental and control group increased. However, the increase in the DI group scores was higher than in the control group. In other words, there was a significant difference between pre-and post-test scores of the DI group whilst no significant difference was reported in the pre-and post-test scores of the control group. These findings emphasized that DI had a positive impact on the FLA of the participants which was parallel to the results of previous studies (Izgi, 2014; Leblebici, 2020; Özer & Yılmaz, 2018; Sayı & Emir, 2017).

One of the factors that caused the increase in students' FLA could be the use of DI strategies. The current study applied the DI strategies such as tiered activities, learner centers, and KWL charts which were influential in the overall FLA development among the participants. These strategies were also implemented in studies by Izgi (2014) and Magableh and Abdullah (2020) which revealed similar results related to the effects of DI on FLA among students. Another factor that increased the students' FLA could be related to the distinctive feature of DI that meets students' uniqueness such as their learning styles, interests, readiness, and needs which were in line with previous research (Özer & Yılmaz, 2018; Sayı & Emir, 2017; Yavuz, 2018).

Apart from the DI and FLA, the results in this study reported that there was a mean difference between pre-and-post-FLM scores. Additionally, there was a significant difference between these two tests as the mean score of post-FLM was calculated as higher than the pre-FLM. This finding supports the positive effect of DI on the FLM among the students which was by recent studies highlighting the positive influence of DI on student motivation (Abu & Gökdere, 2018; Aras, 2018, Harmini & Effendi, 2018; Guay, Roy & Valois, 2017; Meyad et al. 2014). Finally, parallel to the results on FLA and FLM, Gülşen and Mede (2019) reported an increase among the LA of the participants after being engaged in DI-based classes.

Furthermore, regarding the perceptions of the students and their teacher about DI-based classes the gathered findings demonstrated positive viewpoints expressed by the participants. As previously mentioned by Chien (2014), Karadağ and Yaşar (2010), and White (2015), using DI strategies such as tiered activities as well as presenting several task choices related to the students' needs, learning styles, interests, and readiness level led to positive perceptions towards learning English. Other perceptions shared by the students were that they felt more motivated and had much fun during the classes due to the effective use of DI strategies. As argued by Meyad et. al (2014), DI is a flexible method that enables all students - with various needs, interests, levels, and learning styles - to reach the information in different ways by presenting multiple activities and increasing their motivation and joy. The DI students also stated that they enjoyed learning with their classmates since they collaborated and helped each other during the given tasks. Koehler (2010) highlighted that implementing DI increased student interaction and also engagement while working together on multiple tasks. They also perceived the role of their teacher as a guide who facilitated their learning, set them free and self-directed, approached them moderately, helped, and gave them feedback when they needed it which was parallel to recent DI studies (Blaz, 2006; Tomlinson & Imbeau, 2013; Tomlinson & Moon, 2013). Finally, as supported by previous studies the students expressed that they became more autonomous and responsible for their learning in DI-based classes (Betts, 2004; Tomlinson & Moon, 2013).

Similar to the perceptions of the students, their teacher reflected positively on using DI in her English classroom. Specifically, she emphasized that DI-based classes improved autonomy, eagerness, fun, collaboration, and active participation among the students. First, the teacher stated that students were more independent and took responsibility during DI activities. They also had fun while learning which was concurrent with Burkett's (2013) results stating that DI aids students take responsibility for their learning by following their improvement, having their own goals, and evaluating their work and they also have fun while learning. Further, DI promoted interest and eagerness among the students who were actively asking questions and collaborating which was in line with the findings shared by previous studies (Burns, 2004; Crowder, 2013; Ismail & Allaq, 2019).

Pedagogical Implications

The present study suggests some pedagogical implications to be addressed by teacher trainers and material designers. Firstly, the results proved the effectiveness of using DI in English classrooms to help students improve their achievement, motivation, and autonomy. Therefore, it could be recommended that the English language teachers could be enrolled in in-service training about how to use DI in their classrooms along with its principles, strategies, and tasks to be implemented in their classroom practices. In addition, it is certainly vital to consider students' needs, learning styles, readiness level, and interests before preparing DI-based classes. Therefore, material designers should closely address this issue and develop DI-oriented materials addressing the different learning styles and language needs of the students.

Conclusion, Limitations, and Recommendations for Future Research

The present study has some limitations to be addressed in further research. First, due to the setting, the sample size of this study was small. To attain external validity and obtain more comparable results, future studies can be conducted with a larger number of students from different grades with various levels of proficiency. Next, this study was carried out in a state secondary school. A comparative study could be done by adding private schools. Third, the FLA of the students was only measured through a multiple-choice test. Future research can include different measurements ranging from open-ended to fill-in-the-blanks questions to provide in-depth results. Last but not least, the duration of the DI implementation in this study lasted for 8 weeks which could be lengthened by other researchers to gain a deeper understanding and obtain more generalizable data.

In brief, the findings of this study revealed the positive effects of DI on FLA, FLM, and LA among secondary-level English students' achievement, motivation, and autonomy. DI was also perceived positively both by the students and their teacher to learn, teach and practice English. As a result, the outcomes of this study showed that implementing DI into English classes might be considered a significant and pervasive means of teaching and learning, as well as a way of enhancing student achievement, motivation, and autonomy.

References

- Abu, N. K., & Gökdere, M. (2018). The Effect of Differentiated Science Curriculum on Students' Motivational Regulations. *Universal Journal of Educational Research*, 6(3), 455-465. doi:10.13189/ujer.2018.060312

- Aftab, J. (2015). Teachers' Beliefs about Differentiated Instruction in Mixed-Ability Classrooms: A Case of Time Limitation. *Journal of Education and Educational Development*, 2(2), 94-114.
- Alhashmi, B., & Elyas, T. (2018). Investigating the Effect of Differentiated Instruction in Light of the Ehrman & Leaver Construct on Grammar Learning. *Arab World English Journal (AWEJ)*, 9(3), 145-162. doi: <https://dx.doi.org/10.24093/awej/vol9no3.10>
- Alizadeh, M. (2016). The Impact of Motivation on English Language Learning. *International Journal of Research in English Education*, 1(1), 11-15.
- Aras, İ. (2018). *The Impact of Differentiated Instruction on Learner Motivation, Behaviour, and Achievement in Middle School Reading Classes* (Unpublished Master's Thesis). Bahçeşehir University, Istanbul.
- Babbie, E., R. (2010). *The Practice of Social Research* (12th ed.). Belmont, CA: Wadsworth Cengage.
- Ballone, L. M., & Czerniak, C.M. (2001). Teachers' Beliefs about Accommodating Students' Learning Styles in Science Classes. *Electronic Journal of Science Education*, 6(2), 1-41.
- Bender, W. N. (2012). *Differentiating instruction for students with learning disabilities: New best practices for general and special educators* (3rd ed). Thousand Oaks, CA: Crowin.
- Betts, G. (2004). Fostering Autonomous Learners through Levels of Differentiation. *Roeper Review*, 26(4), 190–191. doi:10.1080/02783190409554269.
- Blaz, D. (2006). *Differentiated Instruction: A Guide for Foreign Language Teachers*. Routledge Publishing.
- Burkett, J., A. (2013). *Teacher Perception on Differentiated Instruction and its Influence on Instructional Practice* [Unpublished doctoral dissertation]. Retrieved from Shareok.org.
- Burns, J. P. (2004). *An Analysis of the Implementation of Differentiated Instruction in a Middle School and High School and the Effects of Implementation on Curriculum Content and Student Achievement* (Unpublished doctoral dissertation). Seton Hall University, New Jersey.
- Chalak, A., & Kassaian, Z. (2010). Motivation and Attitudes of Iranian Undergraduate EFL Students Towards Learning English. *GEMA Online Journal of Language Studies*, 10(2), 37-56.
- Chen, J. H., & Chen, Y.-C. (2018). Differentiated Instruction in a Calculus Curriculum for College Students in Taiwan. *Journal of Education and Learning*, 7(1), 88-95. doi:10.5539/jel.v7n1p88
- Chien, C. W. (2012). Differentiated Instruction in an Elementary School EFL Classroom. *TESOL Journal*, 3(2), 280–291. doi:10.1002/tesj.18
- Chien, C. W. (2014). College Students' Attitude Toward and Learning of Differentiated Instruction in Products. *Journal of English Language and Literature*, 1(2), 26-37. doi:10.17722/jell.v1i2.19
- Chien, C. W. (2015). Analysis of Taiwanese Elementary School English Teachers' Perceptions of, Designs of, and Knowledge Constructed about Differentiated Instruction in Content. *Curriculum & Teaching Studies*, 2(1), 1-16.

- Chistlett, V., & Chapman, A. (2005). *VAK Learning Style Questionnaire*. Retrieved from https://www.businessballs.com/freepdfmaterials/vak_learning_styles_questionnaire.pdf
- Clapper, T. C. (2010). Creating a Safe Learning Environment. *PAILAL*, 3(2), 1-6.
- Convery, A., & Coyle, D. (1993). *Differentiation; Taking the Initiative*. Oakdale Printing.
- Crowder, I. G. (2013). *Teachers' Perceptions and Practices of Differentiated Instruction at an Innovative Middle School for Gifted and Talented Students* (Unpublished doctoral dissertation). The University of Georgia, Athens.
- Daskalovska, N., Gudeva, L. K., & Ivanovska, B. (2012). Learner Motivation and Interest. *Procedia- Social and Behavioral Sciences*, 46, 1187–1191. doi: 10.1016/j.sbspro.2012.05.272
- Deci, E. L. (1975). *Intrinsic Motivation*. New York: Plenum.
- Dinçer, S. (2018). Content Analysis in for Educational Science Research: Meta-Analysis, Meta-Synthesis, and Descriptive Content Analysis. *Bartın University Journal of Faculty of Education*, 7(1), 176-190. doi:10.14686/buefad.363159
- Fogarty, R. J., & Pete, B. M. (2011). *Supporting Differentiated Instruction: A Professional Learning Communities Approach*. Solution Tree Press.
- Gardner, R. C., & Lambert, W. (1972). *Attitudes and Motivation in Second Language Learning*. Rowley, Mass: Newbury House Publishers, Inc.
- Golnaz, M. (2019). *Learner Perceptions of Emotions in the Foreign Language Classroom: a One-year Study of the Connections between Anxiety, Enjoyment, Performance and Individual Differences in Adult Education* [Unpublished doctoral dissertation]. Universitat Pompeu Fabra, Barcelona.
- Guay, F., Roy, A., & Valois, P. (2017). Teacher Structure as a Predictor of Students' Perceived Competence and Autonomous Motivation: The Moderating Role of Differentiated Instruction. *British Journal of Educational Psychology*, 87(2), 224-240. doi:10.1111/bjep.12146
- Gülşen, E., & Mede, E. (2019). Effects of Online Differentiated Reading on Reading Comprehension and Learner Autonomy of Young Learners. *ELT Research Journal*, 8(3), 127-157.
- Harmini, T., & Effendi, L. (2018). The Effect of the Use of Differentiated Instruction-Based Module on Students' Learning Motivation. *Unnes Journal of Mathematics Education*, 7(3), 141-146. doi: 10.15294/ujme.v7i3.26764
- Houston, H. L. (2013). *Academic Intrinsic Motivation and Differentiated Instruction in the Regular Classroom: Potential Relationships During the Transition away from Gifted Programming* [Unpublished doctoral dissertation]. The University of Southern Mississippi, Mississippi.
- Ismail, S. A. A., & Al Allaq, K. (2019). The Nature of Cooperative Learning and Differentiated Instruction Practices in English Classes. *SAGE Open*. <https://doi.org/10.1177/2158244019856450>

- Izgi, I. (2014). *Ayrıt Edicilik İlkesine Dayalı İngilizce Öğretim Tasarımı Uygulamasının Öğrencilerin Akademik Başarı ve Derse Yönelik Tutumları Üzerine Etkisi* [Unpublished Master's Thesis]. Akdeniz University, Antalya.
- Jowkar, M., Motlagh, L. N. & Mirshamsi, F., S. (2017). Types of Motivation in Iranian EFL Learners toward English Language Learning. *Journal of English Language and Literature*, 7(3), 560-564.
- Karadağ, R., & Yaşar, S. (2010). Effects of Differentiated Instruction on Students' Attitudes towards Turkish Courses: An Action Research. *Procedia Social and Behavioral Sciences*, 9, 1394-1399.
- Kochler, S. (2010). *Effects of Differentiating for Readiness, Interest and Learning Profile on Engagement and Understanding* (Unpublished master's thesis). St. John Fisher College, New York.
- Leblebicier, B. (2020). *Learning Through Differentiated Instruction: Action Research in an Academic English Class*. [Unpublished Master's Thesis]. Middle East Technical University, Ankara.
- Lukmani, Y. (1972). Motivation to Learn and Language Proficiency. *Language Learning*, 22, 261-273.
- Magableb, I. S. I., & Abdullah, A. (2020). On the Effectiveness of Differentiated Instruction in the Enhancement of Jordanian Students' Overall Achievement. *International Journal of Instruction*, 13(2), 533-548. <https://doi.org/10.29333/iji.2020.13237a>
- Mauludin, L. A. (2021). Students' Perceptions of the Most and the Least Motivating Teaching Strategies in ESP Classes. *Iranian Journal of Language Teaching Research (IJLTR)*, 9(1), 139-157. doi: 10.30466/IJLTR.2021.120980
- Melesse, T. (2015). Differentiated Instruction: Perceptions, Practices, and Challenges of Primary School Teachers. *Science, Technology and Arts Research Journal*, 4(3), 253-264. doi: <http://dx.doi.org/10.4314/star.v4i3.37>
- Meyad, N. A., Roslan, S., Abdullah, M. C. & Hajimaming, P. (2014). The Effect of Differentiated Learning Method in Teaching the Arabic Language on Students' Motivation. *Journal of Social Science Research*, 5(1), 671-678.
- Mok, H. N. (2012). Students Usage Patterns and Perceptions for Differentiated Lab Exercises in an Under-graduate Programming Course. *IEEE Transactions on Education*, 55(2), 213-217. doi:10.1109/TE.2011.2162070
- O'Meara, J. (2011). *RTI with Differentiated Instruction, Grades K-5: A Classroom Teacher's Guide*. CORWIN, a SAGE Company.
- Orakçı, Ş., & Gelişli, Y. (2017). Learner Autonomy Scale: A Scale Development Study. *Malaysian Online Journal of Educational Sciences (MOJES)*, 5(4), 25-35.
- Özer, S., & Yılmaz, E. (2018). The Effect of Thinking-Style-Based Differentiated Instruction on Achievement, Attitude, and Retention. *Kastamonu Education Journal*, 26(1), 11-20. doi:10.24106/kefdergi.374145.

- Park, Z. H. (2017). *Middle School Student Perception and Understanding of Differentiated Instruction: A Phenomenological Study* [Unpublished doctoral thesis]. Liberty University, Virginia.
- Sanacore, J. (2008). Turning Reluctant Learners into Inspired Learners. *The Clearing House: A Journal of Educational Strategies, Issues, and Ideas*, 82(1), 40–44. doi:10.3200/tchs.82.1.40-44
- Santangelo, T., & Tomlinson, C. A. (2012). Teacher Educators' Perceptions and Use of Differentiated Instruction Practices: An Exploratory Investigation. *Action in Teacher Education*, 34, 309-327. doi:10.1080/01626620.2012.717032.
- Sayı, K. A., & Emir, S. (2017). The Effects of Differentiated Foreign Language Instruction on Academic Achievement and Creativity of Gifted Students. *International Journal of Academic Research*, 5(1), 276-288.
- Spencer-Northey, S. (2013). *Handbook on Differentiated Instruction for Middle and High Schools*. Routledge Publishing.
- Spolsky, B. (1969). Attitudinal Aspects of Second Language Learning. *Language Learning*, 19(3), 271-283.
- Surjono, H. D. (2011). The Design of Adaptive E-Learning System based on Student's Learning Styles. *International Journal of Computer Science and Information Technologies (IJCSIT)*, 2(5), 2350-2353.
- Tatar, S. (2017). An Overview of Research on Second/Foreign Language Learner Motivation and Future Directions. *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, 46(2), 697-710. doi: 10.14812/cuefd.282067.
- Tomlinson, C. A. (2017). *How to Differentiate Instruction in Academically Diverse Classrooms* (3rd ed). VA: Association for Supervision and Curriculum Development (ASCD).
- Tomlinson, C. A. (2014). *The Differentiated Classroom: Responding to the Needs of All Learners*. VA: Association for Supervision and Curriculum Development (ASCD).
- Tomlinson, C. A. & Imbeau, M. B. (2013). *Leading and Managing a Differentiated Classroom*. VA: Association for Supervision and Curriculum Development (ASCD).
- Tomlinson, C. A., & Moon, T. (2013). *Assessment and Student Success in a Differentiated Classroom*. VA: Association for Supervision and Curriculum Development (ASCD).
- Tomlinson, C. A., & Brimijoin, K. & Narvaez, L. (2008). *The Differentiated School: Making Revolutionary Changes in Teaching and Learning*. VA: Association for Supervision and Curriculum Development (ASCD).
- Tomlinson, C. A., & Jay, M. (2006). *Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids*. VA: Association for Supervision and Curriculum Development (ASCD).
- Uçar, S. B. (2009). *The Preferences of Turkish University EFL Students for Instructional Activities in Relation to Their Motivation* [Unpublished Master's Thesis]. Bilkent University, Ankara.

- Valiandes, S., & Neophytou, L. (2018). Teachers' Professional Development for Differentiated Instruction in Mixed-ability Classrooms: Investigating the Impact of a Development Program on Teachers' Professional Learning and Students' Achievement. *Teacher Development*, 22(1), 123-138.
- Westwood, P. S. (2016). *What Teachers Need to Know About Differentiated Instruction*. ACER Press.
- White, D. M. (2015). *Differentiated Instruction in the Science Classroom: Student Perception, Engagement and Learning* [Unpublished Master of Science Thesis]. Montana State University, Montana.
- Yavuz, A. C. (2018). *The Effect of Differentiated Instruction on Turkish Students' L2 Achievement, and Student and Teacher Perceptions* (Unpublished master's thesis). Bahçeşehir University, The Graduate School of Educational Sciences, Istanbul.
- Yılmaz-Soylu, M., & Akkoyunlu, B. (2009). The Effect of Learning Styles on Achievement in Different Learning Environments. *The Turkish Online Journal of Educational Technology (TOJET)*, 8(4), 43-50.
- Zareian, G., & Jodaei, H. (2015). Motivation in Second Language Acquisition: A State of the Art Article. *International Journal of Social Sciences and Education*, 5(2), 295-308.

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