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Towards Safer Flight Operations: The Relationship Between L2 Motivation and L2 Achievement

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The purpose of this paper was to identify the relationship between L2 motivation and L2 achievement, a pivotal topic in the aviation industry since it requires more and more proficient English-speaking pilots. Therefore, we aimed to find out the L2 motivational variables that affected L2 achievement in Aviation English courses. The sampling included 111 aviation students. L2 Motivational Self System Questionnaire and Achievement Motivation Measure were instrumented, and semi-structured interviews were conducted as part of our mixed-methods sequential explanatory research design. Our findings revealed a moderately positive correlation between ideal L2 self and L2 achievement; on the flip side, there was a weak negative correlation between ought-to L2 self and L2 achievement. What's more, the L2 achievement of aviation students was found to be predicted by the ideal L2 self and ought-to L2 self; however, achievement motivation failed to account for the L2 achievement of aviation students. The pedagogical implications were discussed in the relevance of L2 motivational variables to aviation students' L2 achievement for an improved learning experience.

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Study Background

The impetus for this research is the need for a better understanding of L2 motivational variables affecting aviation students' L2 achievement since the aviation industry relies on skilled pilots both in terms of pilotage and English language proficiency. Having already been reported as a contributing factor to a number of aviation accidents, including the Tenerife Disaster, the English language proficiency of pilots is an expanding area of interest within the field of English for Specific Purposes (ESP) which focuses on the purposeful use of the language (Hyland, 2022). There is no doubt that the aviation industry is expanding at a rapid pace, and Aviation English has become the lingua franca for aviation professionals. Besides, it is more and more required by professionals in a particular industry to do more than just polish their styles or control their linguistic errors (Alfehaid & Alkhatib, 2020), and the aviation industry is just one of them. Within this framework, it is of utmost importance that aviation students become proficient speakers of this "codified, abbreviated, jargon-filled" language (Trippe & Baese-Berk, 2019), housing a wide range of language use situations (Mede et al., 2018). Therefore, if the variables predicting L2 achievement in Aviation English can be identified, an improved and effective language learning experience can be offered to this particular group of ESP students. In this regard, we aimed to explore the factors that may predict aviation students' L2 achievement.

Aviation English in Turkish Setting

The growing interest in aviation has paved the way for a significant increase in the number of Aviation English courses offered in pilotage schools and at tertiary-level institutions in Turkey. While there were only two institutions accredited by the Turkish Directorate General of Aviation (DGCA) until 2010, the number of these institutions has increased by 2,350% over the last decade. Today, Aviation English courses are offered by 15 universities and 34 private institutions in Turkey as well as the Turkish Air Force Academy. This is related to the increase in the demand for proficient English-speaking pilots both in Turkey and around the world. However, this topic needs further investigation for two reasons: First, it is of utmost importance to identify the driving force for aviation students to learn English and their attitudes so that the quality of the Aviation English curricula can be improved, which was identified as an urgent need in Turkish context (Demirdöken, in press). Second, the motivational factors that may impede or foster L2 learning and hence the L2 achievement of aviation students should be explored. The present exploration of the relationship between L2 motivation, achievement motivation, and L2 achievement of aviation students in the Turkish context will, therefore, lead to new insights into aviation students' L2 development process.

Motivation in L2 Learning

Second language (L2) refers to "any languages learned later than in earliest childhood" (Mitchell et al., 2019, p. 1). L2 learning is, therefore, fundamentally different from the

acquisition of the native language (L1), and it is influenced by several internal and external factors. Motivation, as one of the determinant factors in L2 attainment (Sung, 2013, p. 19), is defined as the force that drives an individual to accomplish high degrees of achievement and performance and to overcome obstacles to any kind of difference (Tohidi & Jabbari, 2012). Concordantly, Dörnyei (2009) argued that the “self” need to be placed at the center of research into motivation by proposing his seminal L2 Motivational Self-system (L2MSS) framework. It consists of three essential elements: Ideal L2 Self, Ought-to L2 Self, and L2 Learning Experience. While the ideal L2 self refers to individuals’ future self-images with regard to L2 and thus serves as a powerful motivator, the ought-to L2 self is associated with attributes that should be possessed to meet the expectations. L2 learning experience “concerns situation-specific motives related to the immediate learning environment and experience” (Dörnyei, 2019, p. 21), such as teachers, peer groups, curricula, and tasks. Considering these components of the L2MSS, it can be hereby argued that motivation should be regarded as the end result of individuals’ wishes to reduce the gap between their image of ideal and actual self. L2MSS is also a significant variable in the ESP context since it is particularly interested in the use of target language in different settings (Saqlain et al., 2020). Accordingly, a number of studies have postulated the influence of motivation in several ESP contexts, including Greece (Katsara, 2008), Iran (Pazoki & Alemi, 2019), and the Gulf (Malcolm, 2013). However, the existing literature fails to shed light on the motivational variables influencing the second language learning of aviation students.

L2 Achievement Motivation

Achievement motivation is another significant variable affecting L2 attainment, and it is defined as “motivation relevant to performance on tasks in which standards of excellence are operative” (Wigfield et al., 2007). Therefore, it can result in poor or excellent performance in L2 attainment. Also, individuals are triggered by the desire to either achieve success or avoid failure. For this reason, they are expected to engage in a task if their intrinsic motivation to participate is stronger than the fear of failure. On the other hand, they are likely to avoid participation if their fear of failure outperforms their intrinsic motivation to participate. In terms of task difficulty, while high achievers are likely to prefer challenging tasks, low achievers tend to prefer easier tasks to avoid failure and ensure guaranteed success in this way. To our best knowledge, the one and only research on achievement motivation in the ESP context was conducted by Zhang et al. (2015). They examined the relationship between student nurses’ achievement motivation and self-efficacy levels. Although mean self-efficacy scores were low, achievement motivation significantly positively correlated with self-efficacy, and they concluded that necessary measures should be taken to develop the self-efficacy of Chinese student nurses thereby improving their achievement motivation. As can be concluded here, there is scant research on achievement motivation in ESP settings. Therefore, it is the second concern of the present study to investigate how achievement motivation, together with L2MSS, affects L2 achievement in Aviation English courses.

Overall, L2 learning is a long process, and it can be challenging to attain high degrees of motivation in contexts like Turkey, where English is not the common means of communication. Therefore, L2 learners who are not motivated enough may fail to accomplish the goals of the instruction no matter how talented they are or how good the curricula and teaching are (Dörnyei,

2005). Also, they may not achieve high degrees of achievement motivation resulting in failure to attain the target learning outcomes. In this regard, it is hypothesized that there is a significant correlation between ideal L2 self, ought-to L2 self, and achievement motivation and aviation students' L2 achievement in Aviation English courses. The present study seeks answers to the following research questions:

- (1) How do L2 motivational variables relate to the English language achievement of aviation students in Turkey?
 - a. Is there a statistically significant difference between high- and low-achieving aviation students in terms of L2 achievement?
 - b. Is there a statistically significant difference between high- and low-achieving aviation students in terms of L2 motivational variables?
 - c. Do L2 motivational variables predict the L2 achievement of aviation students?

- (2) What are the attitudes of aviation students in Turkey toward learning Aviation English?

Methodology

Setting and Participants

This study took place between December 2020 and January 2021 at a major state university in Istanbul, Turkey. The aviation English course offered by this institution covered a range of aviation-related topics, including aviation phraseology, radiotelephony communication, Meteorological Aerodrome Reports (METAR), aviation safety, and aeronautical information. Since the nature and purpose of this research required a particular group of aviation students, the researchers applied the following selection criteria:

- students who were in their last year (senior class students)
- students who had not previously taken the Aviation English course
- students who were enrolled in the Aviation English course at the time of the study
- students who had not sat for the American Language Course Placement Test yet
- students who intend to enroll in flight training upon graduation
- students who volunteered for the study

In the end, 111 aviation students who met all the selection criteria were recruited based on the purposive sampling technique.

Instruments, Procedure, and Analysis

Drawing on Ivankova et al. (2006), the present study adopted the mixed-methods sequential explanatory design consisting of collecting and analyzing the quantitative data and then the qualitative data in two consecutive phases. The present study was carried out in two phases, and the data were collected utilizing two sets of questionnaires and semi-structured interviews (Table 1).

Table 1*The instruments, research questions, and purpose*

Phase	Research Questions	Data Collection Instrument	Purpose
Phase 1	RQ1: How do achievement motivation, ideal L2 self, and ought-to L2-self affect the L2 achievement of aviation students in Turkey?	L2MSS Questionnaire (Taguchi, Magid, & Papi, 2009). Achievement Motivation Measure (AMM) (Karaman & Smith, 2019)	Identifying the relationship between aviation students' L2 motivational variables and their L2 achievement.
Phase 2	RQ2: What are the attitudes of aviation students toward learning Aviation English?	Semi-structured interviews	Identifying the attitudes of aviation students towards learning Aviation English.

In the first phase, L2 Motivational Self System Questionnaire (Taguchi et al., 2009) and Achievement Motivation Measure (Karaman & Smith, 2019) were instrumented to determine the motivational levels of aviation students. While the former included 20 five-point Likert items, the latter included 13 five-points Likert items. The quantitative data collected through these two questionnaires were analyzed by utilizing SPSS (version 23) software. Regression and correlational analyses were run to explore the relationship between aviation students' L2 motivational variables and achievement. Also, students' scores on the American Language Course Placement Test (ALCPT) were compared to determine their L2 achievement at the end of the semester. The ALCPT was administered at the beginning and at the end of the semester, and the researchers did not have to administer any other testing tool to collect data regarding L2 achievement.

In the second phase, semi-structured interviews were conducted with five aviation students. The purpose was to gain insights into their attitudes towards the Aviation English course. The format of semi-structured interviews was based on a "pre-prepared, elaborate interview schedule/guide" (Dörnyei, 2007, p. 135). It included a specific list of questions to be addressed to each interviewee so that the answers could be compared across different interviewees. The interview questions were generated based on L2 motivational variables, and nine questions were addressed to each interviewee. While six interview questions were related to the L2 motivational self-system, the remainder of the questions were about achievement motivation. Participants' responses were analyzed through the qualitative content analysis method, which is based on the identification of thematic patterns in a data set (Neuendorf & Kumar, 2016). In order to establish intercoder reliability, O'Connor and Joffe (2020) suggest that at least two independent coders are necessary for the coding process. Therefore, both researchers took part in this process independently and coded the qualitative data iteratively by instrumenting open, axial, and selective coding techniques (Boeije, 2010; Flick, 2009). Due to the relatively small volume of qualitative data collected from five aviation students, the researchers did not use any qualitative data analysis software. Rather, in the final stage of the

data analysis, the researchers coded ad hoc segments that they determined to be conceptually meaningful, identified the commonalities in responses, and then the emerging codes were grouped into thematic patterns in relation to L2 motivational variables.

Results

The purpose of the present study was twofold. First, the motivational variables were analyzed in relation to the English language achievement of aviation students. Second, the attitudes of aviation students towards the Aviation English course were explored. Overall, four females (3.6%) and 107 males (96.4%) participated in the first phase of the study, and their ages ranged between 20 and 22 ($\bar{x} = 21.23$), whereas five males (100%) aged between 20 and 22 ($\bar{x} = 21.20$) made up the participants in the second phase of the study (Table 2).

Table 2
Participants, Demographics, and Interview Data

Phase	Category	Sub-category	N	%	M
Phase 1	Age	20	5	4.5	
		21	75	67.6	
		22	31	27.9	
		Total	111	100	21.23
	Gender	Male	107	96.4	
		Female	4	3.6	
Total		111	100		
Phase 2	Age	20	1	20.0	
		21	2	40.0	
		22	2	40.0	
		Total	5	100	21.20
	Gender	Male	5	100	
		Female	0	0	
Total		5	100		

Concerning the differences in the L2 achievement of aviation students, the following conclusions were drawn from the quantitative data analyses. First, the reliability tests showed that Cronbach’s Alpha coefficient score of the L2 Motivational Self-System Questionnaire was .764. The same test produced a reliability score of .809 for the Achievement Motivation Measure (Table 3). Therefore, it was concluded that both instruments showed a good degree of reliability, according to Nunnally (1978).

Table 3
Reliability Scores of the Instruments

Instrument	Cronbach's Alpha	N of Items
L2 Motivational Self-System Questionnaire	.809	13
Achievement Motivation Measure	.764	20

The main results of the study were presented based on the research questions respectively in the following titles.

Results regarding RQ1

The first research question sought answers to the motivational variables' relation to aviation students' L2 achievement. Descriptive statistics showed that students' responses varied most on their reported ought-to L2 selves. For instance, aviation students held different opinions on the possible negative future effects of not learning English (ought-to L2 self, Item 7) ($\bar{x} = 2.84$, $SD = 1.832$), which appeared to be the highest variation among all motivational motives. Regarding achievement motivation, students met on common grounds that while working on a task, they thought of how it would feel when and if the task was successfully completed (Item 13) ($\bar{x} = 4.30$, $SD = .880$). On the other hand, students' projections for the future mostly included using English (ideal L2 self, Item 8), which received the highest mean score and appeared the most agreed upon construct ($\bar{x} = 4.50$, $SD = .796$) as well.

In order to analyze the relation of L2 motivational variables to L2 achievement, students were grouped as low and high achievers. The criterion for the grouping was based on students' scores on American Language Course Placement Test (ALCPT). The test-takers must score seventy or higher to be accepted to the pilotage program after graduation, as well as get a fit-to-fly health certificate. The tests are utilized at regular intervals by the institution, and thus the quantitative data regarding participants' performance on ALCPT were retrieved from the institution's database by the researcher for the present study. The test score of seventy on ALCPT, which was conducted at the beginning (Time 1) and end of the academic year (Time 2), was regarded as the cut point to place the participants in one of the two groups, namely low-achievers and high-achievers. In the end, 82 participants were identified as low achievers ($\bar{x} = 47.83$, $SD = 7.987$) and 29 participants as high achievers ($\bar{x} = 75.69$, $SD = 7.431$) at Time 1, whereas there were 82 low achievers ($\bar{x} = 50.20$, $SD = 9.999$) and 29 high achievers ($\bar{x} = 78.72$, $SD = 7.240$) at Time 2 (Table 4).

Table 4
ALCPT Scores at T1 and T2

		N	Min	Max	Mean	SD
Low achievers	ALCPT Time 1	82	32	65	47.83	7.987
	ALCPT Time 2	82	25	69	50.20	9.999
High achievers	ALCPT Time 1	29	70	100	75.69	7.431
	ALCPT Time 2	29	70	98	78.72	7.240

The Pearson correlation analysis (Table 5) showed that the relationship between achievement motivation levels of aviation students and their ideal L2 selves was positive, moderate in strength (Köklü et al., 2006), and statistically significant ($r = .336$, $n = 111$, $p \leq 0.05$), and that the relationship between achievement motivation levels of aviation students and their ought-to L2 selves was negative, weak in strength (Köklü et al., 2006), and statistically significant ($r = -.267$, $n = 111$, $p \leq 0.05$).

Table 5
Correlations

Variables	<i>n</i>	\bar{x}	<i>SD</i>	1	2	3
1. Achievement	111	50.22	6.87			
2. Ideal L2 Self	111	36.45	8.43	.336**	-	
3. Ought-to L2 Self	111	21.41	5.95	-.267**	-.020	-

Correlations are significant at the 0.01 level (2-tailed).

Results regarding RQ1a

The purpose of RQ1a was to determine if there existed a statistically significant difference between high- and low-achieving aviation students in terms of L2 achievement. Accordingly, the homogeneity of variances was first tested to determine whether the data was equally distributed among the three constructs being analyzed. Based on the results of Levene's test (Table 6), equality of variances was assumed. Then, the mean scores of both groups on ALCPT at Time 2 were compared to determine how their L2 achievement differed by the end of the semester, and it was found that mean scores had increased for both groups. Besides, paired samples t-test (Table 7) showed that the change in the mean score from Time 1 to Time 2 was positive and statistically significant for both low achievers ($t(81) = 2.727, p \leq 0.05$) and high achievers ($t(28) = 4.297, p \leq 0.05$). Also, high achievers ($\bar{x} = 3.034; SD = 3.803$) improved more than the low achievers ($\bar{x} = 2.366, SD = 7.856$) from Time 1 to Time 2.

Table 6
Homogeneity of Variances

	Levene Statistics	df1	df2	Sig.
Achievement Motivation	.900	1	109	.345
Ideal L2 Self	.405	1	109	.526
Ought-to L2 Self	3.040	1	109	.084

Table 7
Paired Samples t-test

		Paired Differences							
				95% Conf. Int. of the Difference					
		\bar{x}	<i>SD</i>	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Low achievers	ALCPT T2	2.366	7.85	.868	4.092	.640	2.727	81	.008
High achievers	ALCPT T2	3.034	3.80	.706	4.481	1.588	4.297	28	.000

Results regarding RQ1b

The purpose of RQ1b was to analyze the differences between the low- and high-achieving groups in terms of L2 motivational variables. Independent samples t-test was run for this purpose (Table 8). While there was a statistically significant difference between the two groups in terms of ideal L2 self ($t(109) = 2.178, p \leq 0.05$ and the ought-to L2 self ($t(109) = 2.138, p \leq 0.05$), no significant difference was found between two groups in terms of achievement motivation ($t(109) = -.610, p > 0.05$). With regard to the ideal L2 self, the high-achieving group had a higher mean score of 39.34 ($SD = 8.09$) compared to the low-achieving group ($\bar{x} = 35.43, SD = 8.37$). On the other hand, low achievers had higher mean scores on ought-to L2 self ($\bar{x} = 22.12, SD = 6.18$) compared to high achievers ($\bar{x} = 19.41, SD = 4.81$).

Table 8*Independent Samples t-test*

Variables	Groups	<i>N</i>	\bar{x}	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Achievement Motivation	Low	82	49.98	7.10	-.610	109	.543
	High	29	50.89	6.25			
Ideal L2 Self	Low	82	35.43	8.37	2.178	109	.032
	High	29	39.34	8.09			
Ought-to L2 Self	Low	82	22.12	6.18	2.138	109	.035
	High	29	19.41	4.81			

Results regarding RQ1c

Finally, the purpose of RQ1c was to determine if achievement motivation and L2MSS could significantly predict ESP students' L2 achievement. Results of the multiple regression analysis (Table 9) showed that L2 motivational variables could explain 15% of the total variance ($r^2 = 0.15$; $F(3,107) = 6.533$; $p \leq 0.05$), which proved that L2 motivational variables were moderate in strength and statistically significant predictors of L2 achievement of aviation students. It was also found that the ideal L2 self ($\beta = .532$; $p \leq 0.05$) and the ought-to L2 self ($\beta = -.703$; $p \leq 0.05$) significantly predicted L2 achievement, whereas achievement motivation ($\beta = -.179$; $p \leq 0.05$) did not significantly predict it.

Table 9*Multiple Regression Analysis*

Variables	Unstandardized Coefficients		<i>t</i>	Sig.
	β	Std. Error		
(Constant)	61.010	12.400	4.920	.000
Achievement Motivation	-.179	.210	-.852	.396
Ideal L2 Self	.532	.165	3.226	.002
Ought-to L2 Self	-.703	.229	-3.076	.003

$r = .393$; $r^2 = .155$; $p = 0.000$

Results regarding RQ2

The purpose of the second research question was to gain insights into aviation students' attitudes toward the Aviation English course. Data were collected from five participants between January 5 and 11, and interviews lasted around 12 minutes (Table 10). Data were analyzed qualitatively on MAXQDA software, and three main themes were identified: personal future goals, professional concerns, and personal attachment.

Table 10
Interview Data

Participants	Date	Duration
P1	05.01.2021	13 minutes
P2	05.01.2021	11 minutes
P3	08.01.2021	14 minutes
P4	11.01.2021	15 minutes
P5	11.01.2021	11 minutes

Personal future goals

A key theme identified in this study was participants' *personal future goals*, which were mostly reported concerning the ideal L2 self. P1, for instance, expressed his motivation to learn Aviation English (AE) with a direct emphasis on his future personal goal: "*I can define it [referring to AE] as a must-have for me. I am here to be a pilot so learning English will help me a lot in my work environment.*" In another instance, P5 raised the same issue: "*I want to be a pilot in the future so learning ATC communication, aircraft parts and other aviation terms will contribute a lot to me, and I will be ready for my profession.*" It seemed that participants were motivated to learn Aviation English, which played a significant role in their future plans. It was illustrated by P4 as follows: "*It will help me a lot in my future profession. I should represent my country well and show everyone that we are leading. This is only possible with good control of Aviation English.*" The participants also had clear projections for the future, and their ideal L2 selves were shaped by examples from real life. For instance, P5 imagined himself "...*presenting a brand-new aircraft to other people*" whereas P4 stated, "*I can imagine myself talking to ATC during a flight*". Similarly, "...*talking to other people easily and having a conversation with them about a joint flight operation*" was how P1 imagined himself in the future.

Professional Concerns

It was also found that aviation students' attitudes toward learning Aviation English were shaped by their concerns regarding the target workplace. However, these concerns were mostly related to other people's expectations. Therefore, this theme was associated with the ought-to L2 self, and it was called *professional concerns*. Participants reported that there was high expectation from them, and there would be some negative outcomes if they could not meet these expectations. P1, for instance, mentioned one of these negative outcomes in the workplace: "*They expect me to learn Aviation English to serve best for my own institution... I will have a lot of difficulties and I will fall behind my colleagues. However, I would be a reputable and*

trustworthy person if I learn.” The way other people would think about him was a significant concern. In a similar vein, P2 stated that *“There is a huge expectation. It would definitely be a good thing for me to learn Aviation English. Also, I would have an advantage over my colleagues in our base.”* P2 attributed learning Aviation English to taking advantage in the workplace. On the other hand, P4 did not report any consequence of not learning Aviation English in the way other people would think about him. He said: *“It does not make much difference. If I learn it, I do it for myself; if I do not learn it, it will not change other people's opinion about me.”* Rather, he was more concerned about its negative consequences for his career, reporting:

It would be a huge waste of time for me if I could not learn Aviation English until my graduation. I cannot spend more time learning Aviation English because I should be ready to learn how to fly when the time comes.

P3 also reported that in the event of not learning Aviation English:

I will fail because they only expect me to learn aviation terminology. As I do not have any experience right now, I cannot think of any benefits of learning Aviation English to change the opinions other people hold about me.

Aviation students were aware of the fact that failure to learn AE would have negative consequences for them, but they held conflicting ideas on how it would influence others' opinions about them.

Personal Attachment

Finally, the data analysis showed that participants were personally attached to their profession, and it served as the source of motivation for them. Therefore, this theme was identified as personal attachment, and it was associated with achievement motivation. In this regard, P2 was content with his current effort to learn Aviation English as he reported, *“It is very meaningful for me because I want to be in the shoes of those I see in videos.”* The same contentedness was reflected by P2 as well. He said: *“The examples I see motivate me a lot, so I am quite motivated.”* On the other hand, P4 was more pragmatic, highlighting his interest in only what he will make use of in the future: *“I am focused on what I will need in the future. These include aviation terminology and ATC communication. Therefore, I am doing my best.”* Also, P1 held a relatively lower degree of motivation as he simply stated that *“I believe it is intermediate level.”* Their attachment to their profession was a significant contributory factor to what kept aviation students motivated throughout their L2 learning experience. For instance, P4 mentioned enjoying his AE lessons: *“It is quite enjoyable. I always imagine myself as a pilot, so I have a lot of fun learning aircraft parts and how to communicate over the radio. These all keep me motivated.”* Besides having fun, aviation students' attachment to their future profession was associated with their area of interest and plans. In this regard, P1 reported that *“Constantly, I think of my plans because they are all related to having proficiency in AE. That is how I keep motivated all the time.”* His future projections required being a proficient speaker of AE, and thus, he had a higher degree of achievement motivation.

Discussion and Conclusion

The present study identified the influence of L2 motivational variables on academic achievement. Also, it uncovered student pilots' attitudes towards the Aviation English course. In this sense, it made a substantial contribution to ESP motivation research by focusing on this uncharted context.

Regarding Dörnyei's (2009) L2MSS model, it was conceptualized that the ideal L2 self and ought-to L2 self significantly correlate with aviation students' L2 achievement in Aviation English courses. As hypothesized, the former significantly positively correlated with L2 achievement. Although this finding was in line with the study of Lamb (2012) conducted in Indonesia and Dörnyei and Chan (2013) in China, it conflicted with the findings of Moskovsky et al. (2016), who carried out research in Saudi Arabia and Subekti's (2018) finding in Indonesia. The most reasonable explanation for such conflicting results in different contexts can be attributed to the fact that "reported motivation does not always have behavioral consequences" (Moskovsky et al., 2016) in all settings. The participants in the present study might have already developed clear projections for the future, and this might have positively affected their perceived L2 ideal selves, thus contributing to their L2 achievement. This is evidenced by the fact that this issue was clearly highlighted during the interviews as a source of motivation to learn aviation English, and it also appeared as the most agreed-upon construct in our setting, where students are specifically trained to be a pilot. However, the participants in Subekti's (2018) study were taking an EAP course designed to equip students with reading skills for a better comprehension of scientific articles and journals. In this sense, these EAP students might not have developed an explicit reason to learn English as part of their profession. Similarly, the participants in Moskovsky and others' (2016) study were EFL students with a low ideal L2 self, resulting in a negative correlation with L2 achievement. Therefore, it can be hereby argued that developing a clear-cut projection for the future may have positive implications for students in the context of aviation.

As for the second construct in Dörnyei's (2009) L2MSS model, the ought-to L2 self significantly negatively correlated with aviation students' L2 achievement in Aviation English courses. That is, the higher the ought-to L2 self was, the lower the aviation students tended to perform. However, this finding was not in accordance with Moskovsky et al. (2016), Papi and Abdollahzadeh (2012), and Dörnyei and Chan (2013) in that no significant relationship was found between ought-to L2 self and L2 achievement in those studies. This could be partially attributed to exam-oriented settings like Saudi Arabia (Moskovsky et al., 2016) and Iran (Papi & Abdollahzadeh, 2012), where the score on nationwide proficiency exams is the main criterion for students. Therefore, learning English is mostly mediated by societal factors in those settings. At this point, we must differentiate between such settings and the target setting of the present study. Although the participants in this study are required to score seventy or more on ALCPT to be accepted to the pilotage program in the USA, they sit for that test several times before they graduate. Therefore, they are likely to be influenced to a limited degree by their overall performance on such tests compared to those in the Iranian or Saudi Arabian contexts. Another reason could be the fact that 'externally sourced self-images' fail to serve as the triggering power that can make a difference in actual learner behavior (Dörnyei & Chan, 2013). Consequently, learners do not engage in any meaningful activity to learn the language, and thus weaker links

appear between ought-to L2 self and L2 achievement. As it turned out in the present study, aviation might be a distinct context in this regard, yet future research in a similar context is essential to further investigate the statistically significant yet negative relationship between ought-to L2 self and L2 achievement.

With regard to the second motivational variable of the present study, no significant correlation was found between achievement motivation and L2 achievement. The existing literature showed conflicting results with the findings of the present study. While Emmanuel et al. (2014) concluded in line with our study, Tella (2007) and Sikhwari (2014) concluded on the contrary, presenting a significant and positive impact of achievement motivation on L2 achievement. It is possible that Covid-19 might have had detrimental effects on the participants of the present study. This is similar to the problem originally encountered in a recent study by Zaccoletti et al. (2020) who revealed that there was a significant decrease in Italian and Portuguese students' motivation with the outbreak of the Covid-19 pandemic. In addition, Dörnyei (2005) suggests that language learning is a long process and thus unmotivated students may fail to attain the learning outcomes regardless of their talent, and the quality of curricula and teaching. It may be the case therefore that student pilots' achievement motivation did not correlate with their achievement.

Another point we focused on was the predictive power of the ideal L2 self, ought-to L2 self, and achievement motivation on aviation students' L2 achievement in Aviation English courses. We found out that although Dörnyei's (2009) ideal L2-self and ought-to L2-self constructs could significantly predict aviation students' L2 achievement in Aviation English courses, achievement motivation failed to predict it. Our finding regarding the predictive power of these L2 motivational constructs is significant in that the existing literature fails to provide an account of how L2 motivational variables affect L2 achievement in a goal-oriented ESP teaching setting. Therefore, we have hereby provided an important insight into future ESP pedagogy. Apart from the quantitative evidence regarding the predictive role of the ideal L2 self on L2 achievement, it is also evidenced in semi-structured interviews that aviation students' ideal L2 self-images serve as a powerful motivator to learn Aviation English. For instance, P1 and P5 had explicitly reported that their motivation to learn aviation English was instrumented by their desire to be a pilot. Similarly, P5 depicted himself talking with pilots from other nations during a joint flight operation. However, P4 had reported that there was a big expectation and thus he focused on what he would need in the future. Therefore, developing an ideal L2 self and staying motivated towards their future goals can only be ensured if ESP pedagogy offers hands-on experience and a vast amount of opportunity for aviation students to speak as themselves in the target setting. Also, ESP teachers should design unique course materials presenting real-life use of the target language. Thus, aviation students can feel more attached to their future profession, and they can develop a better L2 ideal self-image for learning Aviation English.

The present study also offered insights into aviation students' attitudes toward learning Aviation English with regard to the ideal L2 self, ought-to L2 self, and achievement motivation. As stated earlier in this paper L2 learning is a long process and thus, it is crucial to be able to stay motivated. Otherwise, aviation students are likely to fail to attain proficiency in the target language. As for our sampling, learning Aviation English was fun and they had a constant interest in aviation, which was reflected in interview responses. It can be argued that these

students' previous L2 learning experience in Turkey mostly included traditional teacher-centered approaches with little or no focus on communicative competence. Also, the participants in the present study would no longer have to take any nationwide proficiency exam to practice their profession; rather they would sit on the American Language Course Placement Test with which they were already familiar. Therefore, their previous L2 learning experience might have impeded the development of a high degree of ideal L2 self. However, experiencing a student-centered approach with a focus on communicative competence might have paved the way for aviation students for faster development of such high degrees of ideal L2 self. This was in line with the findings of Taguchi et al. (2009) in that classroom experience was important for Japanese and Iranian students. Similar to our sampling students, attitudes to learning English played a significant role for Japanese and Iranian students. Contrastively, enjoyment did not play a decisive role in Chinese students' overall motivation in the same study. On the other hand, Turkish aviation students' enjoyment seemed to have contributed a lot to their overall motivation mostly due to contextual differences.

All things considered, Dörnyei's (2005, 2009) L2MSS was found to account for L2 achievement in the Aviation English teaching/learning setting. However, it was not possible to conclude that achievement motivation resulted in poor or excellent performance in L2 attainment in the same setting. Also, aviation students' attitudes toward learning Aviation English were mostly impacted by the attributes they would like to have in the future. Although expectations of other people influenced the same construct, these expectations were not as powerful as internalized instrumental motives.

Implications

The present study was exploratory in nature and researchers aimed to explore the relationship between L2 motivational variables and aviation students' L2 achievement. In light of our findings, the following issues should be considered by ESP practitioners. First, multiple regression analysis and responses to semi-structured interview questions showed that developing a clear self-image for the future is likely to bring success to aviation students. Second, aviation students differ from ESL/EFL students in that the former usually have pre-set future projections and these projections serve as a powerful source of motivation to learn the target language. Therefore, ESP courses should be designed in such a way that they can sustain aviation students' interest and address their communicative needs in the target work environments. These may include authentic materials like interviews with senior pilots, recordings of real-life ATC radiotelephony communications, and field trips. Aviation students can, in turn, get the most out of Aviation English courses, and thus the demand of the aviation industry for proficient English-speaking pilots can be met in the future.

Limitations

The present study was conducted in a non-English-medium instruction (EMI) setting. Therefore, motivational variables affecting L2 achievement may yield different outcomes in EMI ESP settings. Also, only three motivational variables, namely ideal L2-self, ought-to L2-self, and achievement motivation, were considered. However, motivation is complex and thus, other factors that were not considered in the scope of this study might also influence motivation.

Another limitation of the present study was related to the measure that was used to determine achievement. Since the participants were assessed based on their score on the ALCPT, the measurement was limited to the scope of this language test, which assessed test takers' listening and reading comprehension skills as well as their vocabulary and grammar knowledge. Therefore, the standard measurement in this test lacked speaking and writing skills. It should also be noted that data were collected in the middle of a global pandemic and the effects of this pandemic are unknown. Therefore, this should be considered when generalizing the findings of this study. Last but not least, the present study was carried out in Turkey where English was not the native language of the participants. Therefore, student pilots' motivation to learn English as a second language in Turkey may not be generalized to other contexts.

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