

## BRIDGING THE GAP BETWEEN ICAO LEVEL 4 AND 5 IN AVIATION ENGLISH: EXPECTATIONS AND RESULTS

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**Abstract.** The Authors investigated the Aviation English proficiency levels of Vilnius Tech Aircraft Piloting and Air Traffic Control (ATC) students by considering general English examination scores, marks for Aviation English modules and proficiency levels of a specialised speaking task. The aim was to assess how well students acquire the skills and abilities not only to pass an Aviation English proficiency examination (level 4), but also to obtain a higher level 5 necessary for a longer endorsement of their language certificate. Finally, it was determined which areas of language are the easiest and most difficult to master with regards to either a level 4 or 5 according to the ICAO (International Civil Aviation Organisation) Rating scale. It was found that four out of five students have the background skills to reach at least an ICAO level 4 upon graduating, however only a fifth are able to achieve a higher level 5. The proportion of level 5 students does not match the proportion of students with good initial general English results, so there should be a greater focus on improving the language training programme by making it more challenging and broadening its scope in terms of vocabulary and grammar in particular.

**Keywords:** language proficiency, Aviation English, ICAO Rating scale, language proficiency assessment, English for Specific Purposes.

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### Introduction

English language proficiency is an integral part of the training of pilots and air traffic controllers. English has been institutionally approved as the international language of Aviation. The documents state that, as of March 5, 2008, airplane, airship, helicopter and powered-lift pilots, air traffic controllers and aeronautical station operators are required to show that they can speak and understand the language used for radiotelephony communications to the level specified in the language proficiency requirements in Appendix 1 to Annex 1 (International Civil Aviation Organisation [ICAO], 2010). The personnel licensing requirements for both specialties entail that a license is only issued to an individual who can demonstrate their ability to use English in their operational environment for successful communication. To this respect, ICAO has developed and approved the ICAO Language Proficiency Requirements and the Language Proficiency Rating Scale, consisting of 6 levels of proficiency, according to which pilots and ATCs are assessed (ibid). In order to get an operational license endorsement, at least a Level 4 has to be achieved (ICAO, 2010; Tiewtrakul & Fletcher, 2010). However, with English being an ever-expanding lingua franca in many countries and environments, piloting and ATC students already come

with a significant background and proficiency in general English, which leads to think that they would be able to acquire even a higher level of proficiency rather easily. An ICAO Level 5 in English leads to a longer period of endorsement (6 years) and shows that the communication abilities of the candidate in question are better in all criteria that are assessed (ICAO, 2010), meaning that such personnel would need fewer recurrent tests. So, companies who are looking for the best in pilots and ATCs may also differentiate applicants with regard to their language levels and prefer those with a Level 5 or even 6 (Emery, 2021a; Tranter, 2017).

Currently, Aviation English training in the programmes of Aircraft Piloting and Air Traffic Control is not directed towards achieving a certain level, but centres on making sure that graduates are ready to pass their English proficiency examinations. However, each year it is becoming increasingly evident that the majority of the students achieve an ICAO level 4 quite easily. However, they also seem to stay at that level and do not progress to a level 5 when they are graduating. This is alarming, since a student who has barely passed with an ICAO level 4 would be allowed to work as a pilot or ATC; however, nothing ensures that their language could not deteriorate to an insufficient level in a year or when facing unusual circumstances. A study

on Italian pilots' attitude to language testing revealed that pilots view an ICAO level 4 as only barely sufficient for safe operations and that a higher language level should be the long-term goal (Mazzolini, 2019). This suggests that it would be useful to aim higher than the operational level. To gain more insight into the language proficiency of AGAI students, especially regarding ICAO level 5, the current study was devised.

To provide the most efficient and successful training that meets the needs of our students, it is important to have an overall view of the English language proficiency of the students that enter our programmes, to learn how well they are learning to bridge the gap between general English and Aviation English during their training, and, also, what ICAO level they are able to achieve once their studies are completed. Such an undertaking could provide insights into the challenges that learners of Aviation English face when improving their proficiency beyond the level of becoming operational, also into how well ab-initio pilots and controllers in Lithuania acquire the skills and competences to master both standard phraseology and plain language in comparison with learners of other countries, lastly to reveal how successful the current Aviation English teaching programme is in terms of meeting the language needs of students and allow for some recommendations as to what could be improved, not only in our programme, but in other programmes targeting ab-initio aviation students of similar language proficiency. The present article explores these areas through research into the English language proficiency of Antanas Gustaitis Aviation Institute (AGAI) students of Aircraft Piloting and Air Traffic Control study programmes. The aim of the study is to determine the general level of proficiency of AGAI students of Aircraft piloting and ATC at various stages of their studies with respect to ICAO levels 4 and 5, as well as to determine the areas of language proficiency at ICAO level 5 that are most problematic for AGAI students. This was done through the following objectives: analysis of AGAI student entry results, marks in Aviation English throughout their studies, and the assessment of AGAI student speech samples on the basis of ICAO's language requirements i.e., the ICAO rating scale, to determine the areas that are most problematic in terms of reaching an ICAO level 5.

The present article is structured as follows. Section 1 defines Aviation English as an English for Specific Purposes and looks into its integral parts, also examines the importance of language proficiency to the safe operation of flights. Afterwards, the ICAO Language Proficiency Requirements (LRPs) are introduced and discussed. This is followed by a comparison of English Proficiency Requirements for general English and Aviation English to give a clearer picture of the relationship between these two discourses. Next, strategies and advancements in Aviation English teaching are reviewed. Section 2 provides a description of the research methodology that was used in the collection and analysis of data for this article. Section 3 discusses the findings on participants' language proficiency based on their examination results before university,

their study marks in Aviation English courses during the studies as well as their ICAO language levels obtained for a simulated language proficiency examination task. Section 4 provides a more in-depth analysis of the results obtained during the research and their implications for Aviation English training and pilot and ATC English language module curriculum development. Finally, the article ends with conclusions on the language proficiency levels of AGAI students as well as comments on Aviation English language proficiency training with regards to level 5 of the ICAO rating scale.

## 1. Aviation English and language proficiency requirements for pilots and air traffic controllers

### 1.1. Aviation English language proficiency and flight safety

The present article focuses on the variety of English that is referred to as Aviation English. It is a subpart of the English language that is characterised by the use of specialized pronunciation, vocabulary, grammatical structure and discourse styles which are employed by aviation personnel, in particular pilots and air traffic controllers, to communicate in aviation-related contexts. It has been classified as an English for Specific purposes (ESP) (Er & Kirkgöz, 2018; ICAO, 2010) and, apart from flight operations as such, can cover the use of language before or after flight, the language needed for briefings, as well as the dialects used by technical maintenance personnel, and other personnel within the aviation industry, such as flight attendants, dispatchers, legislative bodies, etc. (Cushing, 1997; Mitsutomi & O'Brien, 2003). Radiotelephony is an even more restricted, "semi-artificial" (Breul, 2013) subpart of Aviation English which covers the communication used in the operations by ATCs and flight crews over the radio (Wang, 2007). Such communication is characterised by the absence of face-to-face contact and the use of ICAO standardized phraseology and 'plain language'. Standardised phraseology is essentially a set of words and phrases approved for radiotelephony communications with a specific meaning dependent on the context and operational procedures and is outlined in ICAO Doc. 4444 (ICAO, 2016) as well as Doc. 9432 (ICAO, 2007). The extent of this set of items is around 400 words and consists of phrases the meaning of which has been carefully chosen and agreed upon so as to cause the least misunderstanding (Friginal et al., 2020). Conversely, "plain language refers to the spontaneous, creative and not-coded use of a natural language in circumstances where standardized phraseology cannot be used" (Emery, 2021a; ICAO, 2016), for example emergency or non-routine situations, where communications might require detailed explanations and the content of messages is much varied, impossible to predict, and, therefore, difficult to express in the limited set of phrases available in standard phraseology (Emery, 2015). The present article inevitably focuses on both of these groups due to their interlinked nature.

Successful communication cannot happen without adequate language proficiency. As it is stated in ICAO Doc. 9835, communication is only successful if a hearer's representation of the meaning of an utterance is exact or nearly exact to the speaker's intended meaning (ICAO, 2010). Since English is used as the language of aviation globally, there are inevitably native and non-native speakers using English in the same environment and both groups need to have the skills necessary to communicate to each other (Emery, 2021c; Graddol, 2006; Ishihara & Prado, 2021; Tiewtrakul & Fletcher, 2010; Tosqui-Lucks & Santana, 2022). Proficient language users are able to integrate their use of various communication skills and subskills in real time in order to achieve an understanding (Emery, 2021b; Shawcross, 2008). On the other hand, lack of proficiency leads to communication errors which are high risk in such a challenging communication setting as aviation (Alderson, 2009; Flight Safety Foundation [FSF], 2009; Kukovec, 2008; Zhao et al., 2017). With regards to safety, the link between language and aircraft accidents/incidents was one of the first language related areas of research into Aviation English and has been explored by numerous publications, including (Cushing, 1997; Dusenbury & Bjerke, 2013; Kirk, 2012). Their results show that oral proficiency plays a significant part in safety issues in flight operations. A recent publication by Fowler et al. (2021) analysed whether inadequate English language proficiency of ab-initio piloting students who are non-native English speakers creates issues in safety and what is the role of the ICAO Language proficiency requirements in adding to or alleviating the situation. They analysed safety incident reports from NASA's Aviation Safety Reporting System and found that, since the implementation of the Language proficiency requirements in 2008, the number of aviation safety incidents that was caused by inadequate language proficiency did not decrease, also there is still a worrying number of near-miss situations which are caused by pilots of all experience and proficiency levels be it flight students or commercial airline carrier pilots. Another more recent study investigated the language deficiencies and training needs of Algerian traffic controllers by employing interview techniques, proficiency test as well as classroom observation methods. Their findings suggest that even though controllers understood the safety concerns of lower language proficiency, they had not reached even the baseline proficiency requirements as they only knew a limited range of vocabulary and were able to use only simple expressions, they made many grammar mistakes, and their pronunciation was frequently incorrect (Mekkaoui & Mouhadjer, 2019). The results indicate that the limited exposure of these controllers to English makes it very difficult to reach adequate language proficiency (especially in listening and speaking) and can have a direct impact on flight safety. On a similar note, air traffic controller skills that influence or relate to English Language proficiency have been researched by Suryadi (2020). The researcher analysed Air Traffic Controllers at

Jakarta's Air Traffic Services Centre and was looking for correlation between aviation knowledge, listening skills and ICAO English language proficiency. It was proven that all three criteria influence and correlate with each other. Of the three areas it was found that aviation knowledge of controllers was their best criterion, listening skills were the poorest criterion with 50% of participants in the lowest result range, and overall English language proficiency was limited to levels 4 and 3, of which even 27% of controllers obtained a level 3 and had to retake the test to become operational, which raises definite safety concerns.

## 1.2. ICAO language proficiency requirements for pilots and air traffic controllers

To ensure common standards and to mitigate safety risks, ICAO has issued the ICAO Language Proficiency Requirements and established the ICAO Rating Scale; as a result, language proficiency is assessed according to the same criteria across all its member countries, and a license endorsement is not issued to candidates who do not meet the baseline criteria of ICAO Level 4 (Coertze et al., 2013). The ICAO rating scale distinguishes 6 levels of proficiency across six criteria: pronunciation, structure, vocabulary, fluency, comprehension, and interaction (ICAO, 2010). Each of these is explained by providing descriptors outlining what a candidate can or cannot do at a specific level in each of the criteria. This simplifies the assessment, as the raters know exactly what to focus on in each level of proficiency. To briefly introduce each of the criteria, pronunciation focuses on the candidates' ability to speak naturally, clearly and accurately so that a listener would have no trouble understanding them. Structure refers to the grammatical patterns used by the speaker, whether he is able to use more complex grammar and to do so consistently without mistakes that could cause misunderstandings. Vocabulary focuses on whether the candidate can express his/her ideas by using lexical items accurately and appropriately, employ synonyms as well as paraphrase. Fluency describes how well the speaker can join and comment on his/her ideas by using linkers and discourse markers and do so without unnecessary pausing or interruptions. Comprehension assesses how well a speaker understands what is being said, whether he is able to notice misunderstandings and has strategies of dealing with communicative problems. This goes closely with interaction which assesses how a person manages the speaker-listener relationship, to provide information that is sufficient and accurate in a timely manner (ICAO, 2010).

According to the ICAO Rating Scale, Levels 1–3 are pre-operational, so a candidate whose proficiency is within this range is not allowed to work as a pilot or controller. Level 4 (Operational) is the first level which provides a license endorsement so that a person is allowed to work as a pilot or ATC and is valid for 3 years. A Level 5 endorsement is valid for 6 years and confirms that this candidate is more proficient, thus warranting an extended period of validity. Whereas, a level 6 indicates that a candidate is an expert

language user who can deal with both work related and unexpected situations adequately causing virtually no misunderstandings. This level is also considered widely as being targeted specifically at native speakers (Emery, 2020). Level 6 is the only level where the validity period for pilots and ATCs differs. After ICAO issued the Standards and Recommended Practices, member states adopted these recommendations into their own regulations accordingly. The validity for both specialties of level 6 is generally the same indefinite period in member states; however, in Europe the European Commission made a different choice and agreed that for pilots it is valid indefinitely, whereas for ATCs it is valid for 9 years (European Commission, 2015; 2011).

The implementation of the Language Proficiency Requirements as well as the ICAO Rating Scale itself are a still a widely analysed and debated area. There has been criticism as well as research on most of the areas that have been described starting from the language levels themselves, to language descriptors, to test validity as well as rater training. To name just a few issues, lack of regulatory oversight is highlighted by Alderson (2010) and Emery (2017) as member states can choose which tests they want to authorize for language testing in their country, this has led to countries approving some tests which have questionable validity, thus leading to differences in the proficiency of the speakers who have obtained the same language levels in different countries, which should not happen as the same overall criteria are used. Elder et al. (2017) described a comparative analysis of three different studies on communicative competences in ESP, one of them was Kim's (2012) study on Korean ATCs perspectives towards the ICAO Rating scale. The authors caution that descriptors for proficiency in languages are generally created from a linguistic point of view, whereas in an English for Specific Purposes the specialist of the field being a layperson can have more direct insights into what it means to be successful in communication in that particular domain. Also, they suggest that native speakers should not be placed higher than foreign-language speakers since both can lack the necessary abilities for effective communication in a specific domain (Elder et al., 2017). This is supported by Douglas (2014) who suggests that that it was necessary to look for indigenous criteria to assess interactional, strategic language competences of using English as a lingua franca, and that both native and non-native speakers should exemplify their proficiency in achieving effective communication. Similar view is supported by Whyte (2019) who analysed the implementation of the concept of communicative competence in second language research, teaching and testing, where she states that formal linguistic accuracy is hardly relevant in any real-world context and that language testing has in general ignored such findings so far. This leads to the debate about ICAO level 6 which some say is only there to allow native speakers cruise through the sky without being properly tested just because their first language is English. It is even stated in the language proficiency requirements

(LPRs) that level 6 is almost beyond the reach of foreign language learners (Emery, 2020). This then begs the question why is there such a level at all. Another problem is the difference in requirements for pilots and controllers who are tested by the same criteria, for the same domain, but are issued with different validity period certificates. It is advocated that this should be resolved to find a common retesting period for level 6, but its overall necessity, nevertheless, is supported by the author (ibid.).

### 1.3. Comparison of language proficiency requirements for general English and Aviation English

Apart from ICAO Proficiency Rating Scale levels that are the main indicators of proficiency in the area of aviation, language descriptors that form the basis for the assessment of a candidate are used similarly to assess general English and other varieties of English for Specific Purposes. Across Europe, the Common European Framework of References for Languages (CEFR) is used to assess general English proficiency (Council of Europe [COE], 2020). The CEFR distinguishes six levels of proficiency: A1, A2 (beginner), B1, B2 (intermediate), C1, C2 (advanced). They outline what a candidate can do in each of the seven criteria (Range, Accuracy, Fluency, Interaction, Coherence, Phonology). This framework is widely used in schools and universities in Lithuania. Generally, it is assumed that students who have graduated school should reach at least a B2 in English. There are some parallels as well as differences between the language abilities described by both frameworks (Table 1). There have been some studies analysing the parallels between Aviation English proficiency and the CEFR. It was found that personnel working in this field should have at least a B2, which, in correspondence with ICAOs requirements, is likened to a Level 4 (Emery, 2015). Similarly, Bullock (2015) states that a level 4 "equates to approximately a good B1, low level B2. This is reiterated by Almeida and Gutierrez (2018) who compare a Level 4 to B1. In the practical experience of the authors, each of the CEFR levels covers a very broad range of proficiency, so a strong level B1 candidate is very different from a weak one. Therefore, in this instance, it was decided to choose a B2 as a reference point for a potential ICAO Level 4. The other parallels between the levels specified in both frameworks were drawn from a comparison of their descriptors and are highlighted in italics.

The skills and abilities in both frameworks focus on similar language areas such as comprehension, structure, vocabulary, interaction, fluency with the phrasing in both frameworks being similar in some cases. This might lead to interpretations that students who are able to obtain a specific level in one framework would reach a similar level in the other framework as well. The difference is, however, that rather than focusing on language proficiency in general, the ICAO language descriptors apply specifically to the operational context, meaning work-related aviation context (ICAO, 2010). Therefore, results achieved through

**Table 1.** Comparison of the CEFR descriptors for B1, B2 and C1 and the ICAO rating scale descriptors for levels 3, 4 and 5 (COE, 2020; ICAO, 2010)

Language levels (CEFR/ICAO)	CEFR	ICAO Rating Scale
B1 (Intermediate English) vs. Level 3	Can <i>understand the main points</i> of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can <i>deal with most situations</i> likely to arise whilst travelling in an area where the language is spoken. Can <i>produce simple connected text</i> on topics which are familiar or of personal interest. Can <i>describe experiences and events</i> , dreams, hopes & ambitions and <i>briefly give reasons</i> and explanations for opinions and plans.	<i>Comprehension is often accurate</i> on common, concrete and work-related topics. <i>Able to initiate and maintain exchanges</i> on familiar topics and <i>in predictable situations</i> . Generally inadequate when dealing with an unexpected turn of events. Range and accuracy of <i>vocabulary often sufficient to communicate</i> on common, concrete and work-related topics <i>but range is limited</i> , word choice is often inappropriate. <i>Basic structures are not always well controlled</i> .
B2 (Upper-Intermediate) vs. Level 4	Can <i>understand the main ideas of complex text</i> on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can <i>interact with a degree of fluency and spontaneity</i> that makes regular interaction with native speakers quite possible <i>without strain for either party</i> . Can produce <i>clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue</i> giving the advantages and disadvantages of options.	<i>Comprehension is mostly accurate</i> on common, concrete and work-related topics. <i>Occasional loss of fluency on transition to spontaneous interaction but this does not prevent effective communication</i> . <i>Basic structures are usually well controlled</i> . Errors in basic structures may occur, particularly in unexpected circumstances but rarely interfere with meaning. <i>Responses are usually immediate, appropriate and informative</i> .
C1 (Advanced English) vs. Level 5	Can understand a <i>wide range of demanding, longer texts, and recognise implicit meaning</i> . Can <i>express him/herself fluently and spontaneously</i> without much obvious searching for expressions. Can <i>use language flexibly and effectively</i> for social, academic and professional purposes. Can produce <i>clear, well-structured, detailed text on complex subjects, showing a controlled use of organisational patterns, connectors and cohesive devices</i> .	<i>Comprehension is accurate</i> on common, concrete and work-related topics and mostly accurate when confronted with an unexpected turn of events. <i>Vocabulary is sometimes idiomatic</i> . <i>Speaks at length with relative ease</i> on familiar topics. Makes <i>appropriate use of discourse markers and connectors</i> . <i>Manages the speaker – listener relationship effectively</i> . Basic structures are consistently well controlled. <i>Complex structures have errors which sometimes interfere with meaning</i> .

tests based on the CEFR descriptors cannot be equated with candidate abilities in Aviation English proficiency (Alderson, 2009). Nevertheless, they can serve as a good indicator for determining initial training needs of new students and the potential for the students to reach a specific ICAO level if they successfully transfer the skills into an aviation context. If students enter training with higher abilities of general English already, the course materials and tasks could be adapted to the skills and knowledge corresponding to a higher ICAO level, rather than focusing on just passing the language proficiency examinations for pilots and ATCs.

#### 1.4. Developments in Aviation English training

Miscommunication occurs easily when speakers are unaware of the general principles of communication; therefore, communicative learning strategies coupled with content-based instruction are suggested as the most useful approach for training pilots and ATCs (Almeida & Gutierrez, 2018; Bullock, 2015; Richards & Rodgers, 2001). An investigation into bilingual Spanish pilots' cockpit interactions and language exposure revealed that pilots who were more widely and more often exposed to plain English language showed a greater comfort in conducting their cockpit tasks even in standardized phraseology (Doty et al., 2021). The surveyed pilots highlighted the benefits of learning English from another source than Aviation English and even outside the workplace. Standardized

phraseology clearly cannot be the sole target of aviation English classes, let alone be studied separately without its integration into the broader domain of Aviation English. Some challenges which are still in place for Aviation English trainers across the world have been highlighted by Emery (2021a) where he agrees that even though content integrated learning is the best method for learner engagement and achieving the learning outcomes, it is also one of the most difficult aspects to achieve, as language teachers who have adequate linguistic training as well as knowledge of the subject matter are difficult to find and train. The same goes for the availability of accurate language instruction materials (books, videos, recordings), since they are extremely scarce due to the complexity of preparing specific language tasks that would also convey the content of the subject. As a result, the language trainer is in many cases responsible for both creating the content as well as teaching it. It is surprising to find that this has not changed in almost 20 years while the language requirements have been in place. An answer to this difficulty could be some authentic and accurate materials that could be used to reinforce the learning content that would be readily available to language teacher as well as students. Such data-bases of authentic language use are linguistic corpora which provide language data for a specific domain and can be widely used for research, teaching, material development, and curriculum design purposes. An example of this is a corpus of pilot and controller communications that is being compiled from authentic recordings of

radiocommunications in emergency situations (Prado & Tosqui-Lucks, 2019). Their current corpus consists of more than 110,000 words and provides data that can be used readily for many different purposes including material development and curriculum design. Hopefully, some day it becomes readily-available not only to its creators and researchers of their institutions, but to others investigating this research area.

Some newer studies have highlighted the use of innovative technologies to improve the learning engagement, attitude of students as well as the learning outcomes as such. As a way to tackle the issues with Chinese pilot's Aviation English proficiency that is considered to need improvement, Yan (2022) suggested employing a mix-mode teaching method using an online learning platform supported by big data. They tested two groups of learners who were being taught either with traditional methods or by supplementing the traditional methods with online tasks and examples compiled using big data. Hybrid teaching model was favored by both the students and teachers. Dinçer and Dinçer (2021) analysed the effect of playing a serious game on aviation vocabulary acquisition. They tested two groups of students on their aviation related vocabulary of main 50 terms related with conducting a flight. One of the groups was learning the words the traditional way, whereas the other was playing the flight simulation game X-Plane 11 instead. After the training they interviewed the participants as well. The results showed that playing a serious game can have a positive effect by fostering meaningful learning and improving motivation in such a low-stakes scenario. However, they only analysed improvement on vocabulary of standard phraseology. There is no information on whether this could help with broader areas of language learning and integration. In order to maximise learning, foreign language learners use a variety of digital tools, including e-dictionaries, thesauruses, as well as machine translation applications. A possibility study into challenges posed by Aviation English to Machine Translation conducted by Paul (2021) advises that research into overcoming challenges posed for machine translation by Aviation English could be a huge scope for researchers and developers alike. They also mention the scarcity of parallel Aviation English corpora that are essential for enabling and improving such applications.

The insights into the actual levels of student language proficiency as well as a more definite understanding of the most difficult language features to reach a higher ICAO proficiency level allow to make more informed choices for curriculum development and additional supportive innovative technologies, like online databases, dictionaries and learning platforms.

## 2. Research methodology

For the analysis, both quantitative and qualitative methods were used. Student marks and exam results were collected, categorized and calculated to reveal distributions according to study module, year of entry, and English proficiency

upon start of studies. For this research, the results of AGAI students of Aircraft piloting and Air Traffic Control of entry year from 2013 to 2018 (last Aviation English term from 2017 to 2022) were analysed to understand what are the real levels that the students are likely to achieve, also, which areas of language seem to be most problematic in order to progress to an ICAO level 5 in Aviation English. The results in the following areas were considered:

- State examination results in general English;
- marks for Aviation English modules in their second and last years of study (Aviation English 1, 2 and 7);
- Aviation English proficiency levels awarded in a simulated proficiency examination task.

Overall, the assessment took into account results of 161 students. For the scope of this analysis, the age and gender of participants were disregarded. It is also notable that all students have followed the same modules in their specialties, most of which coincide for both programmes. Both study programmes are being taught and administered in English. The Aviation English courses that they took were taught by the same teachers for students of all entry years. The teachers of the modules also follow the same course descriptions year to year to achieve pre-set learning outcomes in each module. This ensures that the same criteria were applied to marking the students of all entry years that were analysed.

The last part of the study looked more closely into the overall proficiency of the students in Aviation English. Marks can offer only a general understanding of what the participants are capable of, as they depend not only on the students' abilities, but also on what the students were tested on, what additional marks they gained for things like participation, attitude, etc., which can give a false impression of proficiency. Therefore, an Aviation English proficiency task that simulates a regular Aviation English proficiency examination was set up for the participants in their last study year. The task involved talking about a picture of an aviation incident and then answering more general questions on related topics asked by the assessor. Each participant was recorded, and their performance was rated according to the ICAO rating scale by a certified examiner. The participants were given levels for each language skill indicated in the rating scale: pronunciation, structure, vocabulary, comprehension, and interaction. An overall ICAO English proficiency level was also determined and corresponded to the lowest level gained in any of the 6 criteria. This is standard practice in Aviation English testing based on the language proficiency implementation requirements. For the purposes of this analysis, the focus was on ICAO levels 3, 4 and 5. There were no students who are lower than a level 3. As for a level 6, a longer and more complex test would be required for the assessment of this level than the simulated task that was organised; therefore, no one who participated in this study was awarded this level. The simulated task allowed determining which language skills are easy for the participants to reach a level 5 and which of them limit them to a level 4 or even below.

There were some limitations to the study, admittedly, not being able to carry out the simulated task with the study years of 2015 and 2016. However, the data that has already been collected can be extended to include the entrants of the following years (for example 2019 and later) to compare the results and inferences that were made from these results.

### 3. Findings on the English proficiency level of piloting and ATC students

#### 3.1. English proficiency level of AGAI students on entering university

Firstly, the results of AGAI students in State examinations of general English were analysed to understand what skills the students possess before learning Aviation English. This helped to formulate a realistic view of what could be expected with regard to ICAO level 5, as it requires a deeper knowledge of structure (grammatical patterns), fluency (linkers and their usage), pronunciation, all of which are shared by general English and Aviation English. The distribution of State exam scores was analysed according to the study year of entry (Figure 1).

As shown in Figure 2, the proportion of students entering with the highest scores has increased in the last 4 years analysed, except for 2016, with more than 40% of students with 90–100% for their state English exam. This reached a peak in 2018, when more than 52% of entrants got the highest marks for their exams. There has also been a drop in the number of students who do not take the exam and less students who get below 80%. In contrast, in 2013 only two students got the highest scores and there were more students that got below 80% than above that. 13 did not even take the exam, so it was not clear what their proficiency was. Similarly, in 2014, no one had the highest scores and 66% of those who took the exam got below 80%. Applicants in 2016 were also weaker, with 55% of students entering with results that were 80% or less, however 24% of them did get the highest scores.

Since general English proficiency is more commonly distinguished into levels according to the CEFR, the state exam results of AGAI entrants have been converted into

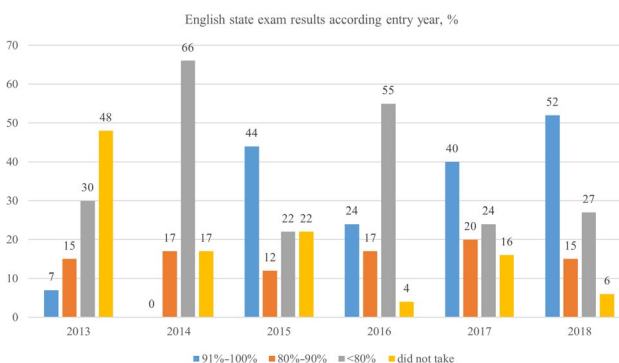


Figure 1. Proportion of students with English State exam results according to entry year

Entrants distribution according CEFR English level

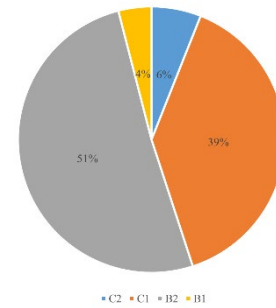


Figure 2. Entrants' distribution according to the CEFR English level obtained from State exam scores

levels, using the recommended guidelines for result portability between international foreign language examinations and State English language examinations (Ministry of Education and science of the Republic of Lithuania, 2012). The analysis of entrant levels according to the CEFR is illustrated in Figure 2.

As shown in the pie chart, only 4 percent of entrants obtained a B1, which shows a slightly less proficient level of English that is suggested for successful further learning of Aviation English. Therefore, 96% of all entrants that were analysed appear to have the language background that should allow to get at least a level 4 Aviation English proficiency examinations. A big proportion of students demonstrate even higher results: C1 (39%) and C2 (6%) respectively, which leads to believe that they have the necessary background to potentially achieve an even higher level in Aviation English. The results indicate that the general majority of students already come with a sufficient language level in general English, and that their initial language skills should not prevent them from successfully obtaining an operational level of English.

#### 3.2. Assessment of Aviation English results during studies

Next, the results of students in Aviation English study modules are analysed to understand how their proficiency develops throughout their studies. There are 7 terms in total when students learn Aviation English in Aircraft piloting and ATC study programmes. In this study, the focus was on the results of the first year (Aviation English 1 (AE1) and 2 (AE2)) and the last year when they learn Aviation English (Aviation English 7 (AE7)). AE1 introduces students to the specific features of Aviation English, provides the basic vocabulary (terms, concepts, abbreviations) as well as the standard words and phrases needed in radio-communications, as well as the basic understanding of the format of radio-communications. AE2 focuses entirely on radio-communications in standard and non-standard situations. The students learn about the procedures, the phrasing of instructions as well as the corresponding answers to instructions. They also learn to differentiate between standard situations and situations where radio-communications are not sufficient, thus, how to switch to using *plain*

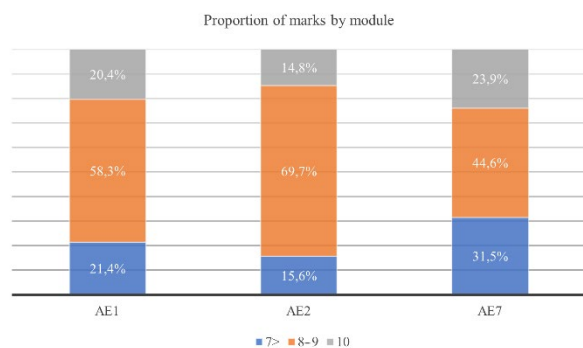


Figure 3. Proportion of marks by study module

language and do so effectively. In AE7, the students are already quite proficient users of Aviation English, including radio-communications, due to having completed or almost completed their professional practical training. As a result, the English training in this module is the most complex, intended to provide an opportunity to acquire enough knowledge and abilities to pass the English language proficiency examination as best as they can (based on AGAL study programme module descriptions as of study year 2021/2022).

The analysis of the results in these modules provides an insight into how well students acquire the learning objectives and what these objectives mean for their ICAO language level. The result distribution according to study module is shown in Figure 3.

In the first term of Aviation English only 21.4% of students obtained a 7 or lower mark for AE1 module. The remaining 78.4% were awarded an 8 or higher, which shows that most of the students learn the features of Aviation English and, in combination with their knowledge of general English, should exhibit at least an ICAO level 4. Of these students, 20.4% received 10 for their work, which suggests that they could have the abilities to reach a level 5 of ICAO. In the following term, a greater proportion of students (69.7%) received average marks. Only 14.8% of the students obtain the highest marks. There were less students with a 7 or below for AE2 than for AE1. In the final year, the proportion of students who obtain the highest or the lowest marks increased: 31.5% of students were awarded a 7 or lower, which corresponds to a failure to meet all required learning objectives and could indicate a potential failure in their proficiency examination. Of the remaining students, 23.9% obtained a 10 for their AE7, indicating a proficiency level meeting the learning objectives of the course fully, which could lead to an ICAO level 5. Of the three years analysed, the final year is the most difficult for low proficiency students. Next, the distribution of students' Aviation English module results is analysed according to entry year (Figure 4). In this part of the analysis year 2018 has been excluded to ensure consistency in comparing the results since part of the courses were taught by different teachers than those of the previous groups.

The five entry years that were analysed reveal that each year the greatest proportion of students obtain marks that

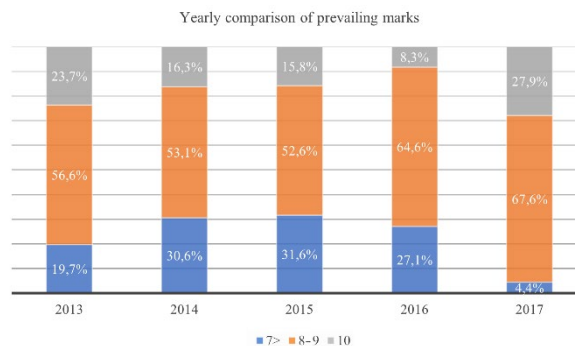


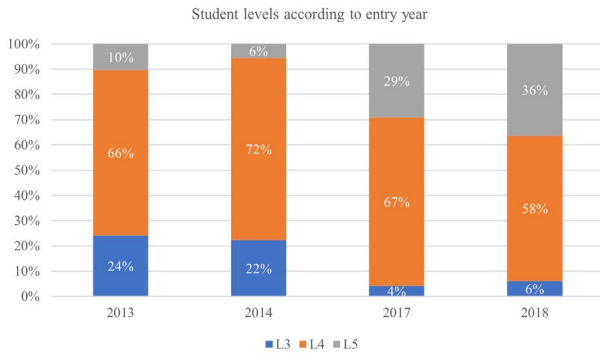
Figure 4. Yearly comparison of prevailing marks in Aviation English modules

are at least 8 or higher. This suggests that they acquire the necessary skills to pass their proficiency examination at the end of their studies with at least a level 4. However, the results show that the students are still closer to a level 4 than a level 5 (Figure 3). The proportion of students obtaining 8 or 9 in the courses has been increasing gradually in the last three years that were observed. The proportion of students who obtain 10 for their modules was decreasing each year, reaching 8.3% at the lowest for students who entered in 2016. However, it must be reminded that this group of students had the lowest entry results in general English, so their performance in the study modules is not too surprising. In contrast, a significantly higher proportion of students (27.9%) who entered in 2017 obtained 10 for their modules. This study year also was the most proficient overall, with only over 4% of students obtaining lower marks.

### 3.3. Aviation English proficiency level according to ICAO requirements

For the last analysis, a speaking exercise was set up during the last Aviation English module in the final study year. This exercise, differently from marks for the Aviation English modules, tested students' proficiency via a speaking task that was performed individually by each student. This task followed the procedure typical for an Aviation English proficiency examination. The student was given a picture of an aircraft incident that they had to describe followed by a discussion on more general topics related to the themes they mentioned in their description. The students conversed with the assessor for 10 min. The assessment was done simultaneously with the task, as is the case during an official examination, and the speaker was rated according to the ICAO Rating scale for each of the seven criteria: pronunciation, structure, vocabulary, fluency, comprehension, interaction and total. The overall level of the student corresponds to the lowest level obtained for any of the separate criteria. The assessment was done by a certified Aviation English proficiency examiner. Due to the absence of the examiner who assesses this task, the simulated exercise was not given to the students who entered their studies in 2015 and 2016. This limited the assessment to 4 study years of entry: 2013, 2014 and 2017, 2018,





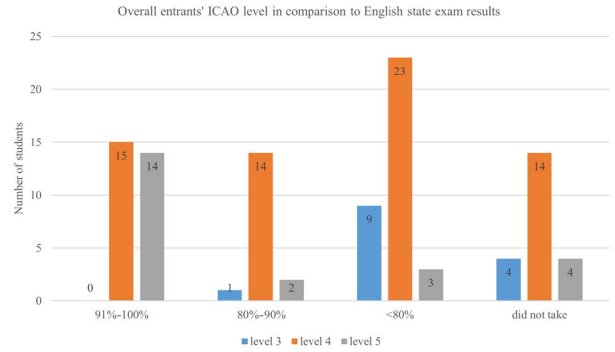
**Figure 5.** Overall proficiency levels of Aviation English according to entry year

which means that the students did the exercise in 2017, 2018 and 2021, 2022 respectively. In total, the speech samples of 104 students, across 7 areas were analysed, which amounted to 728 individual assessment values. First, the results of student overall ICAO levels according to entry year are discussed (Figure 5).

As evidenced by the chart, very few students fail to achieve at least an ICAO level 4 and there has been a significant improvement in the students' results in the last two years of assessment. In the student group that entered in 2013, 24% of the students failed, followed by only 22% in 2014. Whereas in 2017, 2018 the proportion of students failing dropped to only 4%, and 6% respectively. This supports the hypothesis that most students obtain at least an operational level quite easily. A similar upward tendency was found for the level 5. Of the students of 2013 and 2014, only 10 and 6%, respectively, were able to pass with an ICAO level 5. The situation was better for entrants of 2017 and 2018 as 29% and 36% of them showed skills consistent with an overall ICAO level 5. Nevertheless, this is still lower than the proportion of students who exhibited the highest marks for the English state exam (45%).

To see whether the ICAO level results have any relation to their initial general English knowledge, the entrants' level of English based on state exam results was compared to the overall ICAO levels that they obtained for the simulated task. The results of this comparison are provided in the chart below (Figure 6).

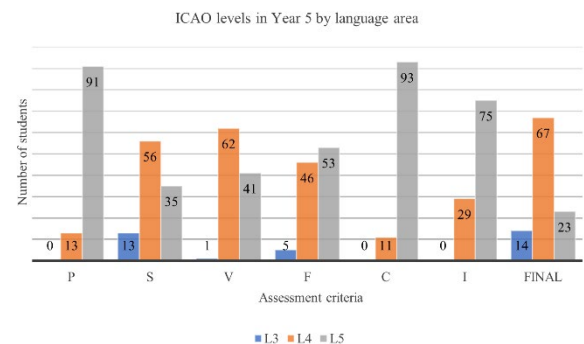
Figure 6 illustrates the ICAO proficiency levels in the simulated task compared with the student state exam results on entry. It is evident that the proportion of students with higher examination results also shows higher scores for Aviation English proficiency. The students whose marks were lower than 80% had the lowest proficiency: 9 of them failed to get a level 4, 23 got a level 4 whereas only 3 got a level 5. The students who were between 80 and 90% for the state exam mostly got level 4 s, with only 2 getting a level 3 and 1 – a level 5. Whereas, of the students with the highest marks for their state exams, 15 students got a level 4 and 14 – a level 5 and none failed. 4 of the students who did not take the English exam failed and 4 of them got a level 5 for their task.



**Figure 6.** Overall entrants' English level according to ICAO requirements in comparison to state exam results

Finally, all speech samples were analysed according to the ICAO rating scale across the 6 criteria, in addition to the overall mark of the students. This distribution allowed to figure out which language areas are the least and most difficult for our student learners with regards to achieving an ICAO level 5. To recap, the language areas that were assessed are as follows: pronunciation (P), structure (S), vocabulary (V), fluency (F), comprehension (C) and interaction (I). The results are illustrated in Figure 7 (below). Pronunciation is the ability to speak and be well understood by the aviation community. Structure here denotes the accuracy and consistency of a person's use of grammatical structures in their speech distinguishing between the ability to use either basic or more complex structures. Vocabulary covers the range and extent of a person's vocabulary and shows if a student can find the right words and terms to express their ideas, also whether they have the variety of language to be able to find synonyms and to paraphrase. Fluency focuses on the speakers' ability to use connectors, discourse markers to join ideas into a fluent cohesive text without unnecessary interruptions or stops. Comprehension is the ability to understand the interlocutor in standard as well as nonstandard situations, whereas interaction covers the ability of the speaker to maintain a conversation, answer the questions informatively, accurately and on time.

The overall levels show that the highest proportion of the students obtain average results with 64.4% of students



**Figure 7.** ICAO levels in the simulated speaking task by language area

at a level 4, 13.4% students at a level 3 and 22.1% of students at a level 5. The language areas that the students master better are comprehension, pronunciation and interaction. Students mainly had no problems understanding the interlocutor and most of them (89.4%) got a level 5 for comprehension. None of the students failed for pronunciation, and only 13 of them (12.5%) got a level 4. Of the students analysed, 75 (72.1%) were awarded a level 5 in contrast to 29 (27.8%) with a level 4 for interaction. This is slightly worse than for comprehension and pronunciation. The other remaining criteria (vocabulary, fluency, and structure) caused more problems for the students. Structure was by far the most difficult of the language areas to master. More speakers failed because of structure than any other criterion, with 13 students (12.5%) failing to meet the requirements for structure. Also, it caused the most trouble to obtain a level 5. Over half of the students (53.8%) only reach a level 4 for structure, and only over a third (33.6%) were able to obtain a level 5. Only 1 person failed because his/her vocabulary was too narrow and inaccurate for the task. Nevertheless, in this area, the majority of the students got a level 4 (59.6%) rather than a level 5 (39.4%). For fluency, slightly more students obtained a level 5 rather than a level 4 with 50.9% and 44.2% respectively. However, 5 students (4.8%) failed to reach a level 4 in this area. The overall results indicate that student learners of Aviation English in their final year of studies are improving in reaching ICAO language proficiency requirements each year, with more students being able to reach a level 5, nevertheless, the greatest proportion of students still remain at a level 4 due to lower proficiency in structure, vocabulary and fluency.

#### 4. English proficiency level of AGAI students with regards to ICAO level 5

The aim of this study was to analyse the English proficiency levels of ab-initio pilots and controllers studying at AGAI by taking into account their state examination results and marks obtained for modules in Aviation English and to compare these results with ICAO language levels obtained by the students in a simulated Aviation English proficiency examination task completed during their final study year. It is hypothesised that piloting and ATC students at AGAI should be able to reach an ICAO level 4 in Aviation English proficiency rather easily due to the requirements for the students on entering university, which include a mark for state English examination, pilot and ATC programmes being administered in English, as well as the possibilities for acquiring English in everyday life through watching movies, reading books, gaming, etc. Apart from that, it seemed that the students proficiency tends to plateau and does not improve further, so it was interesting to analyse what is the real level of these students and whether or not they are able to go beyond the operational level, and if not, then what are the areas of language preventing such progress.

The school examination results suggest that the level of students entering studies is generally improving throughout the assessed period and both pilots and controllers have a sufficient background of general English not only to successfully start learning Aviation English, but also to strive for a higher level of proficiency. Since general English proficiency is more commonly distinguished into levels according to the CEFR, the state exam results of AGAI entrants were converted into levels. The distribution showed that only 4 percent of entrants are a B1, which could be considered as insufficient for a successful outcome. As shown in the comparison of B1 and ICAO level 3 (Table 1), a B1 speaker of general English still has some problems in handling the structure of the language as well as difficulties in comprehension, fluency, etc. It is likely that such candidates, even if they learn the terms and concepts in aviation, would still have problems using these lexical items in fluent speech. Therefore, they might have trouble passing an ICAO proficiency exam. This is supported by Almeida and Gutierrez (2018) who analysed military aviation students and found that upon graduating they do not reach an ICAO Operational level 4 even though they exhibit a B1 in general English. A B2 speaker who consistently learns the specifics of Aviation English should be able to at least pass the ICAO proficiency exam (Bullock, 2015). With this in mind, the remaining 96% of all entrants should have the language background that allows to get at least a level 4. A big proportion of students demonstrated even better results: C1 (39%) and C2 (6%) respectively, which would indicate that they have the necessary background to potentially achieve a very high level in Aviation English.

Next, the results of students in Aviation English study modules were analysed to understand how their proficiency develops throughout their studies. Marks in these modules generally fall into three categories based on the complexity of the learning objectives and how well they correlate with the ICAO rating scale. Students who are awarded a 10 have very few problems of using Aviation English in tasks and situations that were taught in the module, they also show a generally accurate and consistent use of language. Students awarded with either 8 or 9 make mistakes more often but can get their point across using their language skills as they have strategies to deal with miscommunication. Students awarded a 7 and lower have significant difficulties in using Aviation English due to either lack of general language abilities (problems in structure, fluency, pronunciation) or not being able to successfully master the specific features of Aviation English (lack of vocabulary, structures of radio-communications, lack of comprehension of pilot-controller transmissions), or even both.

A slightly different distribution of marks was noticed in the three different study modules that were analysed with regards to the proportion of the lowest and highest marks. This might be due to the specific focus of the module and how well the students are able to adapt to it. The first term of Aviation English (AE1) focuses on an

introduction into the vocabulary of aviation, as well as radio-communications and asks students to merge their knowledge of general English with the requirements and specifics of Aviation English. This can be difficult for students with lower initial proficiency and can also result in a lower mark for proficient students if they fail to adapt to and acquire the specific knowledge of Aviation English. In AE1, only over a fifth of students obtained a 7 or lower mark for AE1 module. The remaining an 8 or higher, which shows that most of the students learn the features of Aviation English and, in combination with their knowledge of general English, should exhibit at least an ICAO level 4. Of these students, 20.4% received 10 for their work, which suggests that they are progressing in their proficiency. The following term, AE2, is more specifically oriented towards radio-communications in both standard and non-standard situations. Both pilots and controllers are expected to learn the vocabulary as well as principles of communication, turn taking, managing transitions between radio-communications and plain language. In AE2, almost 70% of students received average marks and only 14.8% of the students obtained the highest marks. There were less students with a 7 or below for AE2 than for AE1. As the second term is more focused on radio-communications than Aviation English, some of the students with the lower marks have an opportunity to catch up with their colleagues, since radio-communications follow specific rules and employ a reduced vocabulary of lexical items making it easier to learn even though their general English level might be weaker. The necessity of following very specific rules during radio-communications may also be more difficult for some high proficiency students, who previously got the highest marks, as they sometimes tend to rely on their general English knowledge and fail to accommodate their language use to radiotelephony. It was seen, in this term there is even a greater need for improvement as the proportion of students with the highest marks is not increasing.

The last module that was analysed, AE7, which students take in their final year, focuses on improving their overall Aviation English proficiency by incorporating tasks that would develop all of the language criteria that are assessed in the ICAO rating scale. Radio-communications are used alongside other materials to expand their vocabulary, improve their grammar as well as comprehension and interaction, all in the domain of aviation. By now, students' proficiency should have improved due to consistent Aviation English classes and completion of their flying/ATC practice. However, the results are contrary. In the final year, the proportion of students who obtain the highest or the lowest marks increased: over a third of students were awarded a 7 or lower, which corresponds a failure to meet all required learning objectives and could indicate a potential failure in their proficiency examination. Of the remaining students, 23.9% obtained a 10 for their AE7, indicating a proficiency level meeting the learning objectives of the course fully, which could suggest that they have the abilities to obtain an ICAO level 5. Even though the major-

ity of students can be expected to pass their proficiency examination with at least a level 4, the results show that in the last year there were more students who slipped below the level of proficiency than is expected. This might occur because the module is the most difficult and requires the students to use all of their linguistic resources, therefore students who are generally slightly lower in proficiency would find it much harder to catch up. Other reasons may be external, such as focus on other subjects in their last year or working alongside their studies. The proportion of the highest marks is also greater in year 5, indicating that some of the students are improving and could move from being a level 4 to being a level 5. This may also be due to better familiarisation with the ICAO rating scale and what is expected of a language user of each level.

A comparison of Aviation English module results across the five entry years that were analysed revealed that the majority of students acquire the necessary skills to pass their proficiency examination at the end of their studies with at least a level 4, as the prevailing marks for Aviation English modules are 8 or higher. Nevertheless, the proportion of students acquiring the highest marks kept getting smaller over the years and only improved dramatically for the last entry year of 2017, when over 27% of students received the highest marks and only 4% of students got 7 or lower. This would indicate that in this group of students more of them could be expected to get a level 5 on the ICAO rating scale. To see whether this improvement that was noticed in the last year of analysis is consistent and a more detailed observation of students' proficiency should be continued. As mentioned in the introduction, marks for study modules can offer only a general indication of students' overall proficiency. Therefore, it is very important to assess the real abilities of students to obtain an ICAO level 4 or 5 in a practical real-time setting. This was done by using the simulated English proficiency examination task the results of which are discussed in more detail in the following part of this article.

## 5. Analysis of results for determining Aviation English proficiency level according to the ICAO Rating Scale

For the last analysis, a speaking exercise was set up during the last Aviation English module in the final study year. This exercise, differently from marks for the Aviation English modules, tested students' proficiency via a speaking task that was performed individually by each student. This task followed the procedure typical for an Aviation English proficiency examination. The student was given a picture of an aircraft incident that they had to describe followed by a discussion on more general topics related to the themes they mentioned in their description.

Generally, there has been a significant improvement in the ICAO levels of students completing this task. During the first two years that were analysed, over 20% of students were not able to demonstrate proficiency consistent

with an operational ICAO level, and only 10% or less were able to reach a level 5, while in the last two years the proportion of students who are unable to reach an operational level dropped to 4% and 6%, and the proportion of level 5 students increased to 29% and 36%. This confirms the hypothesis that *ab initio* pilots and controllers studying at AGAI reach an ICAO level 4 quite easily. Nevertheless, the number of level 5 students is still lower than the proportion of students who exhibited the highest marks for the English state exam (45%). This shows that even though the students enter with high proficiency levels in general English and obtain high marks for their Aviation English courses, when it comes to demonstrating their Aviation English proficiency, there are some language skills that they fail to master. This leads to a level 4 in one or two criteria, dragging the overall mark with them. Even among the students with the highest general English scores, around half of them were only able to get an operational rather than a higher ICAO level. This once again indicates that student proficiency tends to stagnate even though they are constantly participating in Aviation English courses. This would suggest that there is a need for improving student participation and motivation to seek for a higher level and, also, to strengthen the curriculum of English courses to focus on skills that are required of an ICAO level 5 speaker. A comparison of the ICAO proficiency levels with state examination marks also highlights the importance of general English level of proficiency in acquiring sufficient proficiency in Aviation English. The higher the marks for state English examination, the lower the proportion of students failing the ICAO proficiency task and the greater the proportion of students with higher results in the proficiency task. This corresponds to (Hamzah, 2021) who also indicates better communicative abilities with better fundamental English skills and (Almeida & Gutierrez, 2018) who show that lower overall proficiency in English is consistent with candidates failing to acquire an Operational language level.

The analysis of the speech samples according to the ICAO rating scale across the 6 criteria (pronunciation (P), structure (S), vocabulary (V), fluency (F), comprehension (C) and interaction (I)) highlighted which language areas are the least and most difficult for our student learners with regards to achieving an ICAO level 5. The overall levels show that the highest proportion of the students obtain average results with 64.4% of students at a level 4, 13, 4% students at a level 3 and 22.1% of students at a level 5. This is a rather low score, which just shows how important each of the language areas are, since any one of them, if failed, may lead to a failed overall assessment. The language areas that were the least problematic to students were comprehension, pronunciation and interaction. Comprehension caused the least problems and most of the students achieved a level 5 for it. Admittedly, they were only speaking to one assessor that they knew and there was no additional listening exercise in the simulated task to test out their comprehension fully. So, the overall level of comprehension might be slightly lower than evidenced

by this task. Pronunciation was a close second in the criteria that were rather easy to master. The students were able to communicate without causing major comprehension problems to their interlocutors. The ones who obtained a level 4 for this criterion had a heavier accent, mispronounced several lexical items and/or had other language problems which put a toll on their pronunciation, such as false starts or unnatural pausing. Results for interaction were slightly worse than for comprehension and pronunciation. Still, the majority of students provided clear, informative answers, were able to clarify and explain if they sensed that they are not answering the question. Those who had a lower level for this criterion provided answers that were not informative enough or did not directly answer the question in a timely manner.

The other remaining criteria (vocabulary, fluency, and structure) were more challenging for the students. Structure was by far the most difficult of the language areas to master. By structure here it was meant the accuracy and consistency of a person's use of grammatical structures in their speech. A distinction is made by whether they are able to use more complicated grammatical structures (complex tenses, including perfect, perfect continuous tenses, various clauses, passive voice, relative clauses, conditionals, etc.) versus using the basic structures, such as simple sentence patterns, basic tenses, plural/singular, etc. Over half of the students only reach a level 4 for structure, and only over a third were able to obtain a level 5. This indicates that structure should be one of the focus areas for improvement in order to obtain an ICAO level 5. The results also show that students who have lower proficiency in general English to begin with are not able to improve their structures during their Aviation English studies. This may be due to the focus on vocabulary and radio-communications in Aviation English rather than on strengthening grammar skills or could even depend on external factor, such as lack of students' motivation, as they are happy with passing and do not strive for a higher level.

Vocabulary and fluency were the other two criteria which caused students to fail the exam. Only 1 person failed because of deficiencies in vocabulary. Nevertheless, in this area, the majority of students got a level 4 (59.6%) rather than a level 5 (39.4%). Even though students acquire the vocabulary to speak on aviation related topics and events, they lack the ability to paraphrase, to use synonyms as their vocabulary is too narrow. It seems that even though the students do know several ways of describing a term or concept, they fail to do so during the exercise. This could be improved by exposing them to more tasks requiring these skills or increasing awareness of why use of synonyms or paraphrasing are important. Also, students could benefit from more vocabulary building exercises to expand their vocabularies not only on topics directly related to the operation of flights but also to concepts that relate to other areas in the industry. Finally, in fluency, slightly more students obtained a level 5 rather than a level 4 with half of them at a level 5. However, 5% of students failed to reach a level 4 in this area. These

results suggest that it is necessary to push students to increase the variety of the linking devices that they use and to teach them to use them more consistently, especially to students with lower proficiency. The analysis of the results on the simulated task supports the hypothesis that the students are able to reach a level 4, but have difficulties progressing, as only around a fifth of them reach a level 5 in proficiency. The situation is improving as evidenced by students' results in 2017 and 2018, but this should be monitored further to know for sure.

Taking into account the results that have been obtained, it is evident that ab-initio pilot and controller students at AGAI are in between intermediate and advanced levels of language proficiency. They successfully become operational Aviation English users after the completion of the language training programme at the Aviation Institute. The fact that their studies are conducted in English clearly benefits their ESP language acquisition and supports language learning needs and vice versa. However, the unrealized potential evident from their general English language abilities after school, which have been improving every year, suggests that the training programme should be revised and more focused towards reaching an ICAO level 5 to further students' knowledge and skills in Aviation English as well as general English, to increase flight safety via improved communication abilities and to give students greater chances for employment after graduation.

## Conclusions

After investigation of AGAI students' Aviation English language proficiency in the study programmes of Aircraft Piloting and Air Traffic Control by analysing the available data such as their state exam results, marks for study modules of Aviation English as well as ICAO language levels obtained via a speaking task simulating a proficiency examination, the proficiency level distribution and areas of language deficiency of AGAI students were revealed. The main idea was to avoid looking at one year in particular and instead to inspect the students' journey from being accepted to the university to leaving it as qualified specialists. The analysis was based on the hypothesis that students in these study programmes, due to their background of English as well as continued Aviation English training during studies, should be able to reach at least an ICAO level 4 of language proficiency easily. Another question to answer was whether the students should be expected to reach an even higher level 5 at the end of their studies and, if they fail to, what are the language areas or skills that pose the greatest difficulties for progressing above a level 4.

It was found that in teaching pilots and controllers in Lithuania, the levels to be dealt with are upper intermediate to advanced levels of proficiency. The results obtained during the analysis show that the entry level of students in general English gives a sufficient background for them to continue learning Aviation English and suggest that a greater proportion of students should be capable of

reaching at least an ICAO level 4. In groups that entered the studies recently, over 60% of students had English exam results that were higher than 80% upon entry and only 4% had a B1 level, regarded as insufficient for further successful training. As for results during studies, the majority of students (over 60%) do not fully reach the learning objectives of each year, therefore they still have some problems in terms of use of language that could pose a difficulty to obtain a level 5 for their proficiency examination at the end of their studies. Nevertheless, there is consistent improvement as the proportion of students getting the lowest results (7 and lower) has dropped dramatically recently, and the number of students with the highest results has increased significantly.

Based on the simulated proficiency exam task in year 5, the proportion of students exhibiting skills consistent with an operational English level has increased from 76% (2013) to over 96% (2018). Despite this improvement, only a fifth of all students analysed were able to achieve an overall level 5, even though most of them have entered the university with general English results which were higher than 90%. The language areas where level 4 prevailed or students failed to reach an operational level were structure, vocabulary and fluency. This shows that even though Aviation English has its own specific features of language use, especially in radio-communications, good general English proficiency cannot be overlooked when it comes to excelling at the proficiency examination for the ICAO language level.

The results of the study also reveal that the training programme and the materials used for training in our programmes are appropriate for students to become operational; however, to improve their proficiency beyond that much more attention needs to be given to the weakest areas highlighted by this study drawing closely on the requirements for the level 5. Aviation English courses and materials used to teach them should challenge such proficient learners by providing them with more advanced grammar and listening tasks, with the view of not only strengthening their use of standardised phraseology, but also general English, which could help them maintain and improve proficiency when using Aviation English. The spoken language samples obtained from students during this research can serve as indicators for topics that need to be included in the curriculum, also as training material for students to understand the proficiency rating scale and its criteria better.

## Author contributions

Gabrielė Masiulionienė and Gytė Tupčiauskaitė conceived the study and were responsible for the design, development of the data analysis and data interpretation, Gabrielė Masiulionienė wrote the first draft of the article.

## Disclosure statement

Authors have no competing financial, professional, or personal interests from other parties.

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