

Review research paper

INVESTIGATING ENGLISH FOR AVIATION: AN IN-DEPTH ANALYSIS OF AVIATION ENGLISH TEXTBOOKS - REVIEW

Triyani Retno Putri Sari Dewi¹, Sarah Ohi²

¹Air Traffic Control, Aviation Safety Department, Politeknik Penerbangan Indonesia Curug, 15820 Indonesia

²Language and Literacy Education, Faculty of Arts and Education, Deakin University, 3125, Australia

Abstract. *The purpose of this research study was to conduct an in-depth analysis and compare three popular aviation English textbooks that are used in the training of pilots and air traffic controllers. Additionally, it also aimed to investigate the pedagogical principles underpinning each of the three textbooks. The three selected textbooks were published by three internationally renowned publishers and were chosen because they are widely used in aviation training schools and made as main references. This research study adopted a content analysis method by employing a three-level analysis framework as suggested by (Littlejohn 2011). In addition, Ellis's (2005) list of ten instructed language learning principles were referred to draw conclusions regarding the pedagogical principles underpinning of the three textbooks. The findings suggested that Textbook 3 was the most favourable, Textbook 1 was the second most favourable, and Textbook 2 was the least favourable. Textbook 3 was found to promote more language initiations, more higher order mental operations, more interactions, more authentic inputs, and more opportunities for output productions than Textbooks 1 and 2.*

Key words: *aviation English, content analysis, textbook*

1. INTRODUCTION

The impetus of ICAO English language proficiency requirements stemmed from the fact that many aircraft incidents and accidents have occurred due to language inaccuracies and misunderstandings between pilots and ATCOs (ICAO 2010; Barbieri 2014). Infamous tragic incidents resulting from such errors include the deadliest aviation disaster in history that occurred in 1977 on the island of Tenerife (Spain) resulting in 583 deaths (Kennedy 2008), the 1996 collision between Kazakhstan and Saudi Arabian airlines in Charkhi Dardi, India that killed 349 people (Lahoti 1997), and two aircraft accidents that occurred in Indonesia in 1997 with 234 casualties and in 2012 with 45 fatalities (National Transportation Safety Committee of Indonesia 1997).

Therefore, it is imperative that pilots and ATCOs be able to understand and communicate in English fluently and accurately to prevent similar accidents from

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Corresponding author: Triyani Retno Putri Sari Dewi, Air Traffic Control, Aviation Safety Department, Politeknik Penerbangan Indonesia Curug, 15820 Indonesia

E-mail: triyaniretno@ppicurug.ac.id

happening, as well as to ensure smooth and safe operation of flights. To help achieve this goal, aviation English teachers need to facilitate English teaching and learning by selecting appropriate resources. To this end, there are a selection of English aviation textbooks published by reputable publishers that are available on the global market, including *Aviation English* by Macmillan (Emery and Roberts 2008), *Flightpath: Aviation English for Pilots and ATCOs* by Cambridge University Press (Shawcross 2011), *English for Aviation for Pilots and Air Traffic Controllers* by Oxford University Press (Ellis and Gerighty 2008), *Cleared for takeoff: Aviation English Made Easy* by AE Link Publications (Mariner 2015), and so on. It is crucial that aviation English teachers select the most appropriate textbook for use in their classroom, hence, the drive for this study and the need for the textbooks to be subjected to careful analysis and evaluation.

There is limited prior research on aviation English textbook analysis and evaluation. This paper reports on a research analysis of three English aviation textbooks, purposively chosen because their use is prevalent as primary reference in a large number of aviation training schools. The selected textbooks were published by Macmillan, Cambridge University Press, and Oxford University Press.

2. LITERATURE REVIEW

2.1. Textbook Analysis and Evaluation

Textbooks have long been a part of English language learning instruction with English Foreign Language teachers often consulting textbooks when preparing lessons (Hutchinson and Torres 1994; Richards 2001; Zhang 2017), to access a syllabus, learning materials, language samples, and a variety of tasks and activities (Cunningsworth 1995; McGrath 2002; 2016). However, there are competing viewpoints on textbook use in EFL contexts; some are concerned that prescriptive use could lead to the elimination of teachers in the classroom (Swan 1992), while others agree (Cunningsworth 1995; McGrath 2002 2016) that in the field of English for Specific Purposes (ESP), where the majority of English teachers have no background knowledge of the subject, e.g. medicine, business, aviation, maritime, etc., a textbook written by expert authors from respective fields, specifically for the area is beneficial.

Prior to prescribing and adopting the use of a textbook, it is prudent to conduct an analysis and evaluation to ensure that the text meets the needs of the course. Experts in textbook analysis have various proposals on how to analyse and evaluate textbooks (Cunningsworth 1995; McGrath 2002; 2016; Littlejohn 2011; McDonough et al. 2013; Tomlinson 2011). There are generally three types of textbook evaluations commonly applied, depending on the phases and purposes of selection: pre-use, in-use/whilst-use and post-use evaluation (Tomlinson 2011). Pre-use evaluation is conducted prior to using the textbook with a focus on predicting the potential value of the textbook (Tomlinson 2011). In-use/whilst-use evaluation takes place whilst the text is being used in the classroom, where the teacher or researcher observes what students are doing whilst utilizing the textbook and records what works well and the challenges encountered, etc. (McGrath, 2016; Tomlinson 2011). Post-use evaluation is conducted after the textbook has been used and involves collecting information from the student and teachers to understand their perceptions of the textbook, and to examine the usefulness of the materials and the students' results after using the textbook (McGrath 2016; Tomlinson 2011). This information commonly involves a questionnaire, interview, journal, or

evaluation sheet (Tomlinson 2011, p.259). None of these methods of textbook analysis/evaluation is necessarily superior to the others, but each method has merit depending upon the specific learning context i.e., the purpose, allocated time and availability of resources.

Numerous research studies on textbook analysis and evaluation have been published by utilizing a range of evaluation techniques (Widodo 2007; Ghorbani 2011; Zolfagharian and Khalilpour 2015; Seniwegasari et al. 2018). Prior research includes pre-use evaluation via checklists (Ghorbani 2011; Zolfagharian and Khalilpour 2015; Seniwegasari et al. 2018); in-depth analysis (Widodo 2007); and a combination of impressionistic and in-depth analysis (Fatima, Kazim Shah and Sultan 2015; Solikhah 2020), or the integration of all available methods (Lee 2003), while others have conducted in-use evaluation (Atiqah et al. 2014). There are also research studies on post-use evaluations that employed questionnaire to determine teachers' perceptions of the textbook (Litz 2005; Karsudianto 2019); or checklists and interviews to determine teachers' and students' perceptions of the textbook (Sahragard and Rahimi 2018; Solikhah 2020). Nearly all of those research studies undertaken have focused on general English language teaching textbooks used as references in primary school, secondary school, senior high school, and college academic writing course. Very little research of this sort has been undertaken on the subject of aviation English textbooks (Zolfagharian and Khalilpour 2015).

Cunningsworth (1995) and McGrath (2002, 2016) have identified three similar pre-use evaluation methods: impressionistic, checklists, and in-depth analysis. Impressionistic evaluations involve looking at the front and back cover, the table of contents, and skimming through the textbook to see the organization of the content. Although this gives a general impression of the textbook, it is inadequate as the sole basis for textbook selection, as it does not provide sufficient detail to ensure the fitness of the textbook with the course requirements. The checklist method requires the use of expert-generated checklists or self-generated criteria to determine the textbook's suitability and appropriateness for the learning context (Mukundan et al. 2011). Littlejohn (2011) argues that this method is problematic as the scope of pre-established checklists could be limiting and may not provide sufficient detail or may preclude necessary content and information for textbook analysts (whether teachers or researchers). These checklists generally include implicit assumptions about what 'good' materials should look like, rendering it subjective. Littlejohn (2011) advocates that textbook analysis should be objective. The third method, in-depth analysis, delves further into the textbook by investigating what content is presented. It involves systematically breaking the textbook down into its tasks to discover the principles underlying the textbook development and deduce the role of the textbook, the teacher, and the student (Littlejohn 2011). Following this, textbook analysts draw their own conclusions regarding the desirability of the textbook.

This article reports on research involving the in-depth analyses of three popularly used English aviation textbooks. After noting the shortcomings of impressionistic and checklist-based evaluations (as previously described), we employed pre-use evaluation techniques and subjected each text to in-depth analysis based on the analytical framework offered by Littlejohn (2011).

2.2. Pedagogical Principles Underpinning Textbook Development

Ideally, authors of English language learning textbooks develop their materials “in principled ways related to what they know about how languages can be effectively learned” (Tomlinson 2011). From this viewpoint, when analyzing or evaluating English language learning textbooks, it is important to identify the underlying pedagogical principles to determine whether the materials are effective in facilitating students’ language learning. Researchers in English language teaching and learning have offered an abundance of language learning theories (Long 1980; Krashen 1981; Prabhu 1987; Nunan 2004; Ellis 2005; Richards 2006; Saville-Troike 2012; Fleming 2018). Although Ellis (2005) highlights that there is no consensus regarding the ideal language learning principles, a set of generalized principles to guide language teachers in the classroom and with textbook analysis has been compiled (Ellis 2005). Ellis (2005) uses the term “instruction” to refer to instructed language learning delivered by teachers in the classroom. A focus upon these ten pedagogical principles was considered as part of the analytical process for this study, but with the replacement of the word ‘instruction’ with the word ‘materials’. The following are the ten pedagogical principles in language learning materials as adopted from Ellis (2005):

- Principle 1: Materials need to ensure that students develop both fluency and accuracy.
- Principle 2: Materials need to ensure that students focus primarily on meaning.
- Principle 3: Materials need to ensure that students also focus on form.
- Principle 4: Materials need to primarily develop implicit knowledge of L2 but not neglecting explicit knowledge.
- Principle 5: Materials need to take into account the students’ ‘built-in-syllabus’.
- Principle 6: Successful language learning requires extensive L2 input.
- Principle 7: Successful language learning involve opportunities for output production.
- Principle 8: Interaction in the target language is essential to develop L2 competency.
- Principle 9: Individual differences must be considered while designing materials.
- Principle 10: It is essential to examine free and controlled productions.

2.3. The Current Study

This study aimed to conduct analyses of three popularly used Aviation English textbooks to draw conclusions regarding its fitness for use with EFL learners studying Aviation, and to identify the underlying pedagogical principles present with the textbooks. The research questions guiding the study were:

- RQ1: How can Aviation English teachers select appropriate textbooks for use in Aviation English courses?
- RQ2: How do the selected three textbooks compare when analysed using Littlejohn’s (2011) framework for textbook analysis?
- RQ3: What are the pedagogical principles that underpin each of the aviation English textbooks?

3. METHOD

3.1. Methodology

This research stemmed from a critical theory paradigm, underpinned by an ontological assumption of critical realism, with attention to aspects of both qualitative and quantitative

approaches (Maxwell and Mittapalli 2010). It assumes that there is one reality, but it cannot be fully understood because of "basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena" (Moon and Blackman 2014, 4). Therefore, the epistemology underpinning this study is subjectivism (Dieronitou 2014). The study's content analysis of the selected textbooks involved analysis of the texts including consideration of the books' various formats, articles, visual images, videos, etc. (Bell et al. 2019), as well as some word frequencies and percentage calculations. White and Marsh (2006) define content analysis as "a systematic, rigorous approach to analysing documents obtained or generated in the course of research". In this research, the textbooks were the documents subjected to content analysis.

3.2. Text Selection

The three aviation English textbooks that were analysed in this research study were:

Ellis, S. and Gerighty, T. 2008. *English for Aviation for Pilots and Air Traffic Controllers*. Oxford: Oxford University Press.

Emery, H. and Roberts, A. (2008). *Aviation English for ICAO Compliance*. Oxford: Macmillan.

Shawcross, P. (2011). *Flightpath Aviation English for Pilots and ATCOs Student's Book*. Cambridge: Cambridge University Press.

Throughout this paper they are referred to as Textbook 1, 2 and 3, respectively. These textbooks were purposefully selected as they are available on the global market and their use is widespread as main references in Aviation training schools. Additionally, they are published by reputable publishers renowned for publishing quality textbooks.

3.3. Data Collection

According to Littlejohn (2011), a sample of 10 – 15% of a text is acceptable for the purpose of conducting a research analysis of a textbook and he recommends that sample units be selected for analysis from the middle section of the textbook; consequently, this research complied with these guidelines. Table 1 presents the sample units selected for analysis in this research study.

Table 1. Sample units selected for analysis

Textbook	Number of units	Samples	Number of tasks
Textbook 1	12	2 units (Unit 6 & 7)	Unit 6 = 38 tasks Unit 7 = 36 tasks
Textbook 2	8	2 units (Unit 4 & 5)	Unit 4 = 25 tasks Unit 5 = 29 tasks
Textbook 3	10	1 unit (Unit 5)	Unit 5 = 70 tasks

Littlejohn's (2011) framework identifies 3 levels of analysis for the analysis of language teaching materials (see Task Analysis Sheet (Littlejohn 2011) and this was the process that we adopted for this study.

Task Analysis Sheet (Littlejohn 2011)

<p>1. 'WHAT IS THERE' <i>'objective description'</i></p> <ul style="list-style-type: none"> • statements of description • physical aspects of the materials • main steps in the instructional sections
<p>2. 'WHAT IS REQUIRED OF USERS' <i>'subjective analysis'</i></p> <ul style="list-style-type: none"> • subdivision into constituent tasks • an analysis of tasks: what is the learner expected to do? Who with? With what content?
<p>3. 'WHAT IS IMPLIED' <i>'subjective inference'</i></p> <ul style="list-style-type: none"> • deducing aims, principles of selection and sequence • deducing teacher and learner roles • deducing demands on learner's process competence

3.5. Data analysis

The tasks presented in each of the Sample Units were analyzed by utilizing a Task Analysis Sheet (Littlejohn 2011). A Task Analysis Spreadsheet (TAS) was developed using Microsoft Excel to gather the data. In this table, features presented in the tasks were scored, and the percentages calculated. Each feature stated in the TAS was assessed and determined against Littlejohn's (2011) descriptions. A score of 1 was given for any feature that matched the task. For instance, if the task expects students to 'initiate' the response, such as in a discussion task, a score 1 was given in 'initiate' column, and leave 'scripted response' and 'not required' blank. After the scoring finished, the percentages of each feature of the tasks were calculated by summing up the total number of features divided by the total number of tasks multiplied by 100%.

4. RESULTS**4.1. Section 1: What is the learner expected to do?**

The selected tasks from each textbook were analyzed in relation to three aspects: turn-taking, focus, and mental operations. Turn-taking refers to the roles required of students while learning with the use of the textbook (Littlejohn 2011, 190). The term "focus" refers to whether students are required to pay attention to the meaning of the language, its form, or both (Littlejohn 2011, 190), while mental operations refer to the kinds of mental processes required of the students undertaking the tasks (Littlejohn 2011, 190).

4.1.1. Turn-taking

The analyses revealed that the most prevalent student role in the three aviation English textbooks was to produce scripted responses with proportions of 71.5%, 69.5%, and 50.7% for Textbooks 1, 2, and 3, respectively (see Table 2). This means that students need to provide responses to the questions presented in the textbook using the aviation language presented in the reading or listening texts. For instance, these tasks could involve answering comprehension questions, deciding upon true or false statements, underlining the correct information based on the texts, completing sentences with words provided, matching halves sentences, and so on. These types of tasks are known as controlled practices.

Table 2. The percentage of turn-taking

	Textbook 1	Textbook 2	Textbook 3
a. Initiate	27%	27%	46.5%
b. Scripted Response	71.5%	69.5%	50.7%
c. Not Required	1.5%	3.5%	2.8%

‘Initiate’ was the second most common role expected of the students, with 27% for Textbooks 1 and 2 and 46.5% for Textbook 3. It means that the students are free to voice their opinions or provide information using their own language, whether orally or in writing. For example, answering questions that require them to apply their knowledge, or discuss a specific topic with their peers. These tasks represent free practices.

The tasks that did not require students to play an interactive role had the lowest percentages, with only 1.5% in Textbook 1, 3.5% in Textbook 2, and 2.8% in Textbook 3. This implies that students are encouraged to engage in communicative activities, rather than a passive listener.

Drawing on Ellis's (2005) principle 10; it is essential that materials provide a variety of practices from controlled to free practices. The three textbooks were evidenced to be following this principle. In terms of the aim of achieving fluency, students need to be encouraged to practice their fluency by giving them more opportunities to express themselves in English. Therefore, more tasks that trigger the students to ‘initiate’ are better than those that require the students to produce ‘scripted response’ or ‘not required’ to produce any response at all. As revealed, Textbook 3 provided more opportunities for students to ‘initiate’ using the language. In this regard, Textbook 3 was more favourable than the other two textbooks. Meanwhile, Textbooks 1 and 2 shared the same percentage of ‘initiate’ activities, but Textbook 1 received a larger percentage of ‘scripted response’ activities than Textbook 2. The number of tasks that do not require students to respond at all was also higher in Textbook 2, which is undesirable because students need to engage in active participation to stimulate language development. In this regard, this research identified that Textbook 1 is viewed as more favourable than Textbook 2.

4.1.2. Focus

This part of the analysis aimed to identify what it is that the learners are expected to focus upon while utilizing the textbook materials, namely whether they should put their attention on the language system, the meaning, or both form and meaning. Table 3 displays the proportion of tasks that have been analyzed based on their focus.

Table 3. The percentage of focus

	Textbook 1	Textbook 2	Textbook 3
a. Language system (form)	28.5%	17%	5.6%
b. Meaning	68.5%	83%	90.1%
c. Form & Meaning	3%	0%	4.2%

Table 3 shows that the majority of tasks in each of the three textbooks required students to focus on meaning, with 68.5% of tasks in Textbook 1, 83.5% of tasks in Textbook 2, and 90.1% of tasks in Textbook 3. It reflected Ellis's (2005) Principle 2, which states meaning should be the primary learning focus for effective language acquisition.

Additionally, a small proportion of the textbooks provided tasks that focused on language system (form): 28.5% of tasks in Textbook 1, 17.5% of tasks in Textbook 2, and 5.6% of tasks in Textbook 3. It suggested that the three textbooks also paid attention to language form, which reflected Principle 3. This helps ensure that students develop both their fluency and accuracy of aviation language. However, only 5.6% of the tasks in Textbook 3 focused on language form, indicating that there could be a risk of inaccuracy of language production if insufficient attention is paid to form. Textbook 2 had smaller percentages in the focus on form compared to Textbook 1. If students are to attain minimum ICAO level 4 in structure, we suggest that an increased amount of focus-on-form should be embedded in the textbook. Therefore, in this regard, Textbook 1 appeared to be the most favourable, Textbook 2 was the second most favourable, and Textbook 3 was least favourable.

4.1.3. Mental Operations

This part of the analysis reports an examination of the mental processes involved to complete the tasks set in the textbooks. Not surprisingly, the textbooks featured an array of tasks requiring students to draw upon an assortment of mental processes in order to aid their comprehension of inputs and to produce outputs. Table 4 represents the various mental processes required to complete tasks from each of the three textbooks.

The mental processes presented in Table 4 are categorized into lower-level and higher-level mental operations (Bloom 1956; Anderson *et al.* 2001), all three textbooks had higher percentages of lower-order mental operations, accounting for 74% in Textbook 1, 64.5% in Textbook 2, and 60.5% in Textbook 3. Conversely, there were lower percentages of tasks requiring higher-order mental operations, accounting for 25.5% in Textbook 1, 35.5% in Textbook 2, and 39.4% in Textbook 3.

The findings suggested that all three textbooks laid less emphasis upon nurturing higher-level mental operations, than low-order operations, despite the fact that pilots and ATCOs require high-level mental operations and decision-making skills to perform their jobs effectively. Despite this commonality, in this study, Textbook 3 had the highest percentage of higher order mental operations, and consequently is favourable in this respect, followed by Textbook 2, and then Textbook 1.

Table 4. The percentage of mental operations

	Textbook 1	Textbook 2	Textbook 3
Lower Order Mental Operations			
Repeat Identically	5.5%	0%	4.2%
Repeat with expansion	0%	2%	2.8%
Repeat selectively	0%	0%	1.4%
Retrieve from STM (working memory)	7%	2%	7%
Formulate items into larger unit	8%	0%	11.3%
Decode semantic/proportional meaning	8.5%	8%	0%
Select information	32%	41%	31%
Categorize selected information	6.5%	6%	1.4%
Attend to example/explanation	0%	1.5%	1.4%
Apply stated language rule	6.5%	4%	0%
Total	74%	64.5%	60.5%
Higher Order Mental Operations			
Hypothesize	0%	0%	2.8%
Analyze language form	4%	3.5%	2.8%
Apply general knowledge	1.5%	12%	7%
Negotiate	2.5%	3.5%	0%
Express own ideas/information	17.5%	16.5%	26.8%
Total	25.5%	35.5%	39.4%

Another significant finding is that the tasks did not correspond to any of Ellis's (2005) enumerated principles. The addition of another principle regarding mental operations would be a valuable implication.

4.2. Section 2: Who with?

The second section of the Task analysis addressed the type of participation expected of students in the classroom; that is, *With whom are students expected to collaborate?* Table 5 presents the percentages of participation found in the three textbooks.

Table 5. The percentage of participation

	Textbook 1	Textbook 2	Textbook 3
Individually			
Learner individually simultaneously	65.5%	71%	26.8%
In pairs/groups/class			
Learner(s) to the whole class	0%	1.5%	22.5%
Learners with whole class simultaneously	7%	11%	11.3%
Learners in pairs/groups, whole class observing	1.5%	0%	7%
Learners in pairs/groups, simultaneously	26%	16.5%	32.4%
Total	34.5%	29%	73.2%

It can be seen from Table 5 that Textbooks 1 and 2 had similar expectations for student participation in completing the tasks, whereas Textbook 3 was significantly different. Textbooks 1 and 2 placed greater emphasis on individual learning, as demonstrated by the fact

that 65.5% of tasks in Textbook 1 and 71% of tasks in Textbook 2 required students to work individually, while the remaining tasks entailed collaboration with peers. Meanwhile, 73.2% of tasks in Textbook 3 required students to collaborate with other peers in completing the tasks, and the rest to be completed independently.

This finding relates to Ellis's (2005) principle 8 regarding the significance of interaction in the development of L2 proficiency. The finding suggests that Textbooks 1 and 2 would benefit from the inclusion of more tasks that involve student interaction. Notably, interaction is one of the six skills specified by the ICAO language proficiency requirements; hence, a textbook that enhances interactive skills is viewed as more favourable. Based on the fact that Textbook 3 placed the greatest emphasis on student interaction, it may be argued that Textbook 3 is the most favourable in this respect, followed by in turns Textbook 1, and Textbook 2.

4.3. Section 3: With what content?

This last section of the task analysis identified the type of input provided to students and the expected output from them. The input and output are broken down according to their form, source, and nature.

4.3.1 Types of Input for Learners

Input provided to students may be presented in the form of graphic, written words/phrases/sentences, spoken words/phrases/sentences, and extended written or aural discourses (Littlejohn 2011, 190). Table 6 presents the findings from the analysis of the forms of input presented in the three textbooks.

Table 6. The percentage of input form

	Textbook 1	Textbook 2	Textbook 3
Graphic	4%	13%	8.4%
Written Input			
Words/phrases/sentences: written	55.5%	40.5%	43.7%
Extended discourse: written	9.5%	13%	0%
Total	65%	53.5%	43.7%
Aural Input			
Words/phrases/sentences: aural	13.5%	17%	22.5%
Extended discourse: aural	17.5%	16.5%	25.4%
Total	31%	33.5%	47.9%

As presented in Table 6, it is clear that the majority of input in all 3 textbooks is written, involving words, phrases and sentences. The levels of Aural input were similar in Textbooks 1 and 2 (approx. 30%), but more prevalent in Textbook 3 (approx. 48%). Graphic input was given the lowest percentage in all three textbooks, with 4% in Textbook 1, 13% in Textbook 2, and 8.5% in Textbook 3. According to Table 6, Textbook 1 provided 65% written input, 31% aural input, and 4% graphic input; Textbook 2 provided 53.5% written input, 33.5% aural input, and 13% graphic input; and Textbook 3 provided 43.7% written input, 47.9% aural input, and 8.4% graphic input. It is evidenced from this finding that all the three

textbooks provided extensive L2 input, which relates to Ellis's (2005) principle 6 regarding the significance of extensive L2 input for successful language learning.

The finding also implied that Textbooks 1 and 2 emphasized written input more than Textbook 3, which emphasized aural input. It is important to note that communication between pilots and ATCOs is aural, requiring speaking and listening skills but little reading and writing skills (ICAO 2010). It is essential that students receive as much aural input as possible to familiarize themselves with listening, an essential skill for their jobs. With regard to consideration of input types, Textbook 3 was the most favourable among these textbooks, followed by Textbook 2, and then Textbook 1.

4.3.2. Expected Output from the Learners

Similar to input, the expected output from students can range from graphic, written/aural words/phrases/sentences, to extended written/aural discourses. Table 7 (below) presents the types of expected output form from students for all the three textbooks.

Table 7. The percentage of output form

	Textbook 1	Textbook 2	Textbook 3
Graphic	0%	2%	0%
Written Output			
Words/phrases/sentences: written	60%	54%	33.8%
Extended discourse: written	0%	0%	2.8%
Total	60%	54%	36.6%
Aural Output			
Words/phrases/sentences: aural	27%	33%	56.4%
Extended discourse: aural	13%	11%	7%
Total	40%	44%	63.4%

As shown in Table 7, there is a significant difference in the expected output of students using Textbooks 1 and 2 vs Textbook 3. While Textbooks 1 and 2 projected higher written output (60% and 54%, respectively), Textbook 3 expected more aural output (63.4%). Graphic output was only produced from Textbook 2 in 2% of the tasks.

The importance of output production relates to Ellis's (2005) principle 7, which emphasizes output production opportunities for successful language learning. Despite the fact that the three textbooks provided opportunities for output production, it is desirable to have more aural output than written output. As previously mentioned, pilots and ATCOs communicate primarily in spoken language. Consequently, students should have more opportunities for output production to enhance their fluency. In this regard, Textbook 3 was found to be the most favourable, Textbook 2 was second, and Textbook 1, last.

4.3.3. Sources of Input and Output

Input and output in class activities may come from the textbook, the teacher, the learner(s), or from outside the course/lesson (Littlejohn 2011). Tables 8 and 9 below present the input and output sources for all three textbooks. Table 8 demonstrates that textbook is the primary source of input, accounting for 94.5%, 100%, and 88.7% in Textbooks 1, 2, and 3, respectively. Meanwhile, the secondary source of input in Textbooks 1 and 3 is the student(s), which

accounts for 4% and 11.3% respectively. There is a small percentage of tasks that use outside class sources as input, amounting to 1.5% in Textbook 1; while Textbooks 2 and 3 do not require input to be sourced from outside the lesson.

Table 8. The percentage of input source

	Textbook 1	Textbook 2	Textbook 3
Materials	94.5%	100%	88.7%
Teacher	0%	0%	0%
Learner(s)	4%	0%	11.3%
Outside the course/lesson	1.5%	0%	0%

When it comes to producing output, students may discover the source mostly from the textbooks, as much as 74.5%, 79%, and 67.6% in Textbooks 1, 2, and 3, respectively (refer to Table 9). Furthermore, they draw on their own experience, knowledge, and opinion, which accounts for up to 25.5% of tasks in Textbook 1, 21% of tasks in Textbook 2, and 31% of tasks in Textbook 3. Additionally, Textbook 3 requires students to find source outside the lesson in 1.4% of the tasks.

Table 9. The percentage of output source

	Textbook 1	Textbook 2	Textbook 3
Materials	74.5%	79%	67.6%
Teacher	0%	0%	0%
Learner(s)	25.5%	21%	31%
Outside the course/lesson	0%	0%	1.4%

This finding is useful to draw conclusions on the roles of textbook, teacher, and student when using the textbook. As can be seen from Tables 8 and 9, materials/textbook was regarded as the primary source of input and output. Surprisingly, the teacher was found to have 0% proportion as input/output source. This does not mean, however, a teacher does not have any participating role at all in the classroom. Due to the fact that the analysis was limited to a *pre-use* evaluation of the textbook, there was no opportunity to observe implementation of the texts' activities in the classroom, nor to observe teacher input beyond the textbook. This pre-use evaluation revealed that the teacher is expected to be facilitator in the teaching/learning process in the classroom. Additionally, learners were represented as the second-highest proportion of input/output source. In English for Specific Purposes (ESP), it is possible that students have more background knowledge of the field than the teacher, ideally the teacher should encourage students to share their own experience and knowledge as a source for learning collaboratively in the classroom.

The findings also indicated that only a small percentage of input/output was to be sourced from outside the course/lesson which is contrary to Ellis's (2005) Principle 6, which suggests teachers/materials should establish opportunities for students to obtain input outside of the classroom. All three textbooks could benefit from the inclusion of more tasks requiring students to obtain input from outside the classroom to find more opportunities to develop themselves; this is because a successful language learner seeks opportunities to develop themselves outside of class time and does not rely solely on the lesson they receive in class. Teachers/materials developers should ensure that students have this opportunity.

All three textbooks were comparable in this regard, so none was found more favourable than the others.

4.3.4. The Nature of Input and Output

The last aspect of the tasks analyzed relates to the nature of input and output – whether it is grammatical rule, linguistic item, non-fiction text, fiction text, or personal information/opinion (Littlejohn 2011). Tables 10 and 11 present the nature of input and output in all the three textbooks.

Table 10. The percentage of input nature

	Textbook 1	Textbook 2	Textbook 3
Grammatical rules	28.5%	25%	9.9%
Linguistic items	39.5%	41.5%	31%
Non-fiction	8%	9.5%	26.8%
Fiction	2.5%	13%	0%
Personal information/opinion	21.5%	11%	32.4%

Table 11. The percentage of output nature

	Textbook 1	Textbook 2	Textbook 3
Grammatical rules	29%	25%	9.9%
Linguistic items	38%	42%	31%
Non-fiction	8%	5.5%	25.4%
Fiction	2.5%	9%	0%
Personal information/opinion	22.5%	18.5%	33.8%

As shown in the tables, Textbooks 1 and 2 shared similar percentages of input and output nature, while Textbook 3 was different. In Textbooks 1 and 2, linguistic items were the most frequent type of input and output, accounting for 38% - 39.5% and 41.5% - 42% of the tasks in Textbooks 1 and 2, respectively. In contrast, personal information/opinion was the most common type of input and output in Textbook 3 was, accounting for 32.4% - 33.8% of the tasks. Grammatical rules were the second most prevalent type of input and output in Textbooks 1 and 2, accounting for 28.5% - 29% and 25%, respectively, whereas linguistic items placed second in Textbook 3 with 31%. Personal information/opinion, which accounted for 21.5% - 22.5% and 11% - 18.5% of tasks in Textbooks 1 and 2 was ranked third, whereas in Textbook 3, non-fiction texts were the third most prevalent nature of input and output, accounting for 25.4% - 26.8%.

This finding suggested that Textbook 3 valued personal information/opinion of the students to be included in classroom activities more than the other textbooks. Creating opportunities for utilizing more personal information/opinion relates to Ellis's (2005) principles 2 (primary focus on meaning), principle 4 (primarily develop implicit knowledge), principle 7 (opportunities for output production), principle 8 (interaction develops L2 proficiency), principle 9 (valuing individual differences), and principle 10 (examining controlled and free productions).

Even though different in proportions, the three textbooks focused more on providing knowledge related to linguistic items, such as vocabulary and language functions rather than grammatical rules. This is related to Ellis's (2005) principle 2 (primary focus on meaning).

It is also worth noting that Textbook 3 used non-fiction texts the most compared to the other textbooks by using real conversation recorded from pilots and ATCOs communication. It is related to aspect of authenticity, which is missed from Ellis's (2005) principles list.

In Textbooks 1 and 2, grammatical rules received much attention, which related to Ellis's (2005) principle 3 (focus on form), while Textbook 3 paid little attention to focus on form. In this regard, Textbook 3 should include more tasks which focus on form, to help students improve their accuracy in using the language.

In this aspect of task analysis, Textbook 3's strengths outweigh its weaknesses; thus, it is argued to be the most favourable, followed by Textbook 1, and then textbook 2.

4.4. Summary

In summary, the final results of the comparison of the three aviation textbooks is presented in Table 12 to determine which aviation English textbook emerged more favourable than the others based on the result of tasks analysis and inferences drawn from Ellis's (2005) principles of instructed language learning.

Table 12 The Comparison Result of Three Textbook Analyses

		Textbook 1	Textbook 2	Textbook 3
1	Turn-taking	□□	□	□□□
2	Focus	□□□	□□	□
3	Mental operations	□	□□	□□□
4	Interaction	□□	□	□□□
5	Input	□	□□	□□□
6	Output	□	□□	□□□
7	Sources of Input/Output	□	□	□
8	Nature of Input/Output	□		□□
	Total	12 points	11 points	19 points

In terms of turn-taking, Textbook 3 was evidenced to provide more opportunities for students to 'initiate' than Textbooks 1 and 2, which required students to produce more 'scripted responses'. Several tasks in Textbook 3 required students to communicate their ideas or opinions by applying their general and language knowledge without relying on the textbook to find the answers within the material presented. For example, engaging in lead-in questions, discussing a certain topic, or expressing their ideas. It is believed that providing students with more practices to use the target language (L2) will facilitate their L2 acquisition. In this respect, Textbook 3 was awarded three points. On the other hand, Textbooks 1 and 2 shared the same percentage of 'initiate', but Textbook 1 received a larger percentage of 'scripted response' than Textbook 2. The number of tasks that did not require students to respond at all was also higher in Textbook 2, which was not desirable because students need to engage in active participation to stimulate language development. In this regard, Textbook 1 was better than Textbook 2; therefore, Textbook 1 received two points, whereas Textbook 2 received one point.

In terms of focus, all three textbooks focused primarily on meaning, which was desirable for developing students' communicative skills. However, attention on form should not be overlooked, since it would help improve accuracy of the language. The least percentage of focus on form was found in Textbook 3, implying that students would risk being inaccurate in their language production. Meanwhile, Textbook 2 had less percentage of focus on form than Textbook 1. Due to the fact that language structure is assessed in the ICAO English language proficiency test, it was preferable to have materials that focus primarily on meaning but not neglecting focus on form. In this sense, Textbook 1 was more favourable than the other two textbooks, obtaining three points, whereas Textbook 2 received two points, and Textbook 3 one point.

Textbook 3 contained the highest proportion of tasks requiring higher order mental operations compared to the other two textbooks. Pilots and ATCOs require critical thinking skills to perform their jobs effectively. For instance, decisions made by pilots prior to takeoff or landing, or by ATCOs' while applying vertical and horizontal separation to prevent aircraft collision. Therefore, Textbook 3 earned three points, while Textbook 2 earned two points for having more tasks requiring higher mental operation than Textbook 1, which earned one point.

It was discovered that Textbook 3 provided more peer collaboration than Textbooks 1 and 2, which was believed to facilitate language learning. In this sense, three points were granted to Textbook 3. Meanwhile, Textbook 1 contained more collaborative tasks than Textbook 2. Textbook 1 received two points in this category, whereas Textbook 2 obtained only one.

It was favourable that aviation English textbook provided more aural input in order to familiarize students with the nature of aeronautical radiotelephony communication between pilots and ATCOs. In this regard, Textbook 3 earned three points for providing more aural input than the other two. Meanwhile, Textbook 2 provided more aural input than Textbook 1, earning Textbook 2 two points, and Textbook 1 one point.

Aural fluency should be emphasized in terms of output production, as it is one of the skills examined on the ICAO language proficiency test. Textbooks that provide more opportunities for aural output are therefore preferred. In this regard, Textbook 3 scored three points, Textbook 2 two, and Textbook 1 one.

In terms of sources for input/output, the three textbooks shared comparable values. All textbooks relied on the materials as the input/output source and students' own experience, however they have not optimized input/output obtained from outside the course/lesson, which, according to Ellis's (2005) principle, is useful for facilitating language development outside of classroom time. Given that all three textbooks had the same ideals in this regard, none is deemed more favourable than the others, earning each textbook one point.

Finally, regarding the nature of input/output, it was discovered that Textbook 3 valued the personal information/opinion of the students, utilized more non-fiction texts than the other two textbooks, and placed less emphasis on form than the others, earning it two plus points and one minus point. Meanwhile, Textbook 1 was found to contain more tasks that valued personal information than Textbook 2 (one plus point for Textbook 1), but less non-fiction texts than Textbook 2 (one minus point for Textbook 1). In terms of grammatical input, Textbook 1 gave more attention to it than Textbook 2, earning one plus point for Textbook 1. In total, Textbook 3 earned two points, Textbook 1 scored one point, and Textbook 2 received no points.

As seen in Table 13, Textbook 1 received 12 points, Textbook 2 received 11 points, and Textbook 3 received 19 points, indicating that Textbook 3 was the most favourable, Textbook 1 was the second most favourable, and Textbook 2 was the least favourable.

In addition, it was discovered that all the three textbooks adhered to Ellis's (2005) principles of instructed language learning. Also, Textbook 3 reflected two additional principles not listed in Ellis's (2005) principles. Those were related to developing higher order mental operations that facilitate the development of students' critical thinking, and the authenticity of input that is useful for the specific purpose of using the language in the target situation (future jobs as pilots and ATCOs).

5. CONCLUSION

The analyses of the three aviation English textbooks namely *Aviation English: for ICAO Compliance*, *English for Aviation: for Pilots and Air Traffic Controllers*, and *Flightpath: Aviation English for Pilots and ATCOs* was motivated by the fact that these textbooks are widely used as references in aviation training schools in Indonesia, despite there being no in-depth analysis of their quality. Utilising Littlejohn's (2011) framework for textbook analysis and Ellis's (2005) ten principles of instructed language learning enabled us to deduce the underlying pedagogical principles of the three textbooks. Based on the study's findings, it is concluded that the three textbooks share similar pedagogical principles, but with differences in proportions. Ellis's (2005) ten pedagogical principles (see p. 5-6) were found to underpin the three aviation English textbooks

A key discovery illuminated by our research was that, additionally, Textbook 3 was founded on two other pedagogical principles that were not listed in Ellis (2005) as follows:

1. The materials promote higher order of mental operations
2. The materials use authentic input

The evaluation of the three textbooks using Littlejohn's (2011) framework in conjunction with Ellis' (2005) pedagogical principles revealed that Textbook 3 was most favourable, Textbook 1 came second and Textbook 2 was the least favourable. Additionally, positive characteristics of Textbook 3 included that its' tasks promoted more language initiation, encouraged higher-order mental operations, it was intended to stimulate more interaction, was designed to provoke more authentic input, and provided more opportunities for output production than Textbooks 1 and 2. Moreover, it is suitable for use both for student and professional pilots/ATCOs, in an initial training as well as recurrent training.

Suggestions for further research of this type include that researchers analyze larger samples, or all units, of a textbook to generate more detailed results and that consideration to undertaking a team of approach to enhance validity; and researching with a group of aviation English teachers to rate the textbooks using a Task Analysis Sheet. Other possibilities include conducting in-use and post-use analyses. Given the increasing reliance upon aviation as the most popular mode of transport in a global transnational world, it is imperative that more research needs to be conducted in this industry.

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