

Developing Bilingual Pocket Book with QR Codes and Infographics Features for Information Technology Lecturers and Staff

Faiz Ushbah Mubarak¹, Atiqah Nurul Asri¹

¹State Polytechnic of Malang

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ABSTRAK

Abstract: The rapid growth of international students from tertiary level has reached nearly 3 million since 2007. This condition comes from short-term and long-term mobility. Students coming from developed countries, such as Australia, North America and Western Europe, tend to choose short-term program. Meanwhile, pupils coming from Asian-Pacific countries prefer a lengthy extensive study in pursuing their education. The needs and demands of international students coming to this nation must be in line with the development of the universities or institutions inside. Since 2018, State Polytechnic of Malang has opened international classes for foreigners. This institution provides 9 classes for 9 study programs from 7 various departments each year. Particularly in the Information Technology (IT) department, the foreign students are around 8 to 12% of the whole class population. Unfortunately, they do not receive a matriculation program and an Indonesian language course before getting the lectures. This can lead them to have a misinterpretation or misunderstanding while having communication with their Indonesian friends. At the present, administration staff and Information Technology lecturers also do not get a short education or additional media in communicating using English language. The emergence of the issue causes inadequate services to the foreign students. If this problem continues, there will be dissatisfaction with the college services and a decrease in quality assurance. Due to this condition, the researchers aim to develop a bilingual pocketbook for the IT lecturers and administration staff. Specifically, to make the pocketbook more informative, the researchers also include the usage of Quick Response (QR) code and infographics.

Abstrak: Pertumbuhan pesat mahasiswa internasional dari tingkat tersier telah mencapai hampir tiga juta sejak tahun 2007. Kondisi ini berasal dari mobilitas jangka pendek dan jangka panjang. Mahasiswa yang berasal dari negara maju, seperti Australia, Amerika Utara, dan Eropa Barat cenderung memilih program jangka pendek. Sementara itu, siswa yang berasal dari negara-negara Asia-Pasifik lebih memilih studi ekstensif yang panjang dalam mengejar pendidikan mereka. Kebutuhan dan tuntutan mahasiswa internasional yang datang ke bangsa ini harus sejalan dengan perkembangan universitas atau institusi di dalamnya. Sejak tahun 2018, Politeknik Negeri Malang membuka kelas internasional untuk orang asing. Lembaga ini menyediakan 9 kelas untuk 9 program studi dari 7 jurusan yang berbeda setiap tahunnya. Khusus di jurusan Teknologi Informasi (TI), mahasiswa asing tersebut berjumlah sekitar 8 hingga 12% dari seluruh populasi kelas. Sayangnya, mereka tidak mendapatkan program matrikulasi dan kursus bahasa Indonesia sebelum mendapatkan kuliah. Hal ini dapat menyebabkan mereka salah tafsir atau salah paham saat berkomunikasi dengan teman-teman Indonesia mereka. Saat ini, staf administrasi dan dosen Teknologi Informasi juga tidak mendapatkan pendidikan singkat atau media tambahan dalam berkomunikasi menggunakan bahasa Inggris. Munculnya isu tersebut menyebabkan pelayanan terhadap mahasiswa asing kurang memadai. Jika masalah ini terus berlanjut, akan terjadi ketidakpuasan terhadap layanan perguruan tinggi dan penurunan penjaminan mutu. Melihat kondisi tersebut, peneliti bertujuan untuk mengembangkan buku saku bilingual untuk dosen TI dan staf administrasi. Secara khusus, agar buku saku lebih informatif, peneliti juga menyertakan penggunaan kode Quick Response (QR) dan infografis.

Alamat Korespondensi:

Faiz Ushbah Mubarak
State Polytechnic of Malang
Jalan Soekarno Hatta 9 Malang
E-mail: faizum@polinema.ac.id

The development of international students in higher education has been speedily improved in the past decade. They have grown rapidly due to students' interest in learning outside their country origins. The statistics show that international students from tertiary level reach almost twofold from 3 million in 2007 to 5.6 million in 2018 (OECD, 2018). Further, this phenomenon comes from short-term and long-term mobility. Short-term mobility relates to students who study overseas for only several months or less than one year while long-term mobility is vice versa.

Based on the UNESCO (2009), short-term program for international students is varied and coming from mostly developed countries, namely Australia, North America, and Western Europe. Additionally, the data states that pupils from those nations enroll in a university exchange to merely experience cross culture and boost their language skills. Ziguras & McBurnie (2011) report that students from low to middle income countries enroll in a long-term program since they believe that getting global qualifications can increase their value in the workplace. Due to this condition, Asia-Pacific students tend to go for a longer period for taking a complete academic degree.

Meanwhile in Indonesia, foreign students hosted in this country has reached 7677 people across the globe (UIS, 2020). The top three foreigners come from Malaysia, Timor-Leste, and Thailand. In fact, the students from countries hold 56% of the total population of international students in Indonesia. The needs and demands of international students coming to this nation must be in line with the development of the universities or institutions inside.

To be internationally superior, Telbis, Helgeson, & Kingsbury (2014) discuss that universities need to be developed in college life as well as academics life. In line with the statement, Indonesia has published the classification in college clustering based on performance and development level. Referring to article 56 on Law on Higher Education No. 12/2012, college clustering is a university or institutions grouping based on data compiling quality indicators of the higher education performance in PDDIKTI (Indonesian Higher Education institutions). The purpose of college clustering is to build a foundation for the Ministry of Education and Culture and PDDIKTI to make continuous improvements to increase organizational performance. (Ministry of Education and Culture, 2020). College clustering ranges from cluster 1 to 5 based on four assessment criteria. The following criteria are input, process, output, and outcome (Directorate General of Higher Education, 2020).

In this case, the Ministry of Research, Technology and Higher Education published new rules in college clustering in 2017. It is stated that one of the variables in the input indicator is the number of international students in each university. Considering this current issue, if the universities and institutions have more overseas students, they may get a higher rank. To achieve maximum results in clustering, this situation obliges them to keep advancing their educational system to get more international students.

Since 2018, State Polytechnic of Malang has opened international classes for foreigners. This institution provides 9 class for 9 study programs from 7 various departments each year, namely (1) Electrical Engineering, (2) Mechanical Engineering, (3) Civil Engineering, (4) Chemical Engineering, (5) Accounting, (6) Business Administration, and (7) Information Technology (IT). Most of the members of the class are a combination of foreigner and local students. Specifically in the IT department, the foreign students are around 8-12% of the whole class population. Unfortunately, they do not receive a matriculation program and an Indonesian language course before getting the lectures. This can lead them to have a misinterpretation or misunderstanding while having communication with their Indonesian friends.

At the present, administration staff and Information Technology lecturers also do not get a short education and additional media in communicating using English language. The emergence of the issue causes inadequate services for the foreign students. If this problem continues, there will be dissatisfaction with the college services and a decrease in quality assurance. It needs to be resolved considering that foreign students can have more difficulties in their learning due to their problems in communication. Because of this condition, the researchers aim to develop a pocketbook for the IT lecturers and administration staff.

Pocket book is a small-sized paperback that can be saved in a pocket. The usage of pocketbooks has been confirmed to be beneficial as an additional medium in learning. Pocket book is proven to be a functional yet applicable media for the people in their spare time (Putra, et al., 2016). In addition, Sofiana and Ayu (2017) also discuss that pocketbook is also easy to carry and simple to learn. Due to its size, people can bring it anywhere and everywhere whenever they like. Printed in A6 paper, readers can reach their pockets to learn or look up to any information inside. Another study by Cahyono, Tsani & Rahma (2018) pocketbook can be a useful learning media to attract students' attention to boost their interests in learning. In this research, to make the pocketbook more informative, the researchers also include the usage of Quick Response (QR) code and infographics.

Infographics is a word combination of "information" and "graphics". Infographics are a sequence of description and visualization presented in bar graphs, charts, and diagrams (Rezaei & Sayadian, 2015; Wertz & Saine, 2014). The cooperation of text and graphics can be easier for the readers to comprehend the message significantly. A study by Bicen & Beheshti (2017) shows that the application of infographics can make students display positive feedback responses in the class. By having an infographics media in learning, it can also enhance students' skill in writing a summary (Mubarok & Asri, 2020).

Another additional media that can be added in the development of the pocketbook is Quick Response (QR) codes. QR codes is a dimensional symbol that has been applied since 1994 in automotive parts (Soon et al., 2008). It can be tracked using smartphone cameras for numerous purposes and usage. Further, it has widely spread due to its accessibility and simple access in storing databases (Wei et al., 2017). In education, it can be optimized to simplify URL addresses to connect on the internet and become a shortcut to check information.

Referring to the impacts and explanation above, the researchers are interested in developing a pocketbook for IT staff and lecturers. With the additional media in infographics and QR codes, we hope that this pocketbook can help the administration staff and IT lecturers to have a communication with the international students. This research is beneficial for Education staff as a guideline for communicating with foreign students in raising an excellent service. In addition, for IT lecturers, this pocketbook can be used as a learning resource or additional reference in teaching and learning.

METHOD

The researchers applied Educational Research and Development (E-R&D) method in this study. E-R&D is a research design to create an authentic educational product using a cycle of process (Borg and Gall, 2003). The cycle of process contains Needs Analysis & Data Collection, Planning, Early Product Development, Expert Validation, First Product Revision, Early Trial, Second Product Revision, Field Test, Final Product Revision, Dissemination.

Due to the limited time of the research, this paper applied seven phases of the method above. The pocketbook were designed to the following steps:

1. **Needs Analysis & Data Collection:** First, an analysis on the potential and problem should be carried out. Observations and interviews are used to identify the potential difficulties that may arise in the field. Next, we gather the data by collecting numerous information through distributing questionnaires, conduct interviews, and review of literature on developing the materials.
2. **Research Planning:** In this phase, the researchers made a blueprint of the pocketbook dealing with preliminary study. It may lead to the targets' needs on learning English through providing authentic and suitable content.
3. **Early Product Development:** This step is intended to design items and materials that will be developed in response to the problem that has to be solved. Specifically, the researchers propose infographics and QR codes to meet the subjects' requisite.
4. **Expert Validation:** It deals with the assessment of the pocketbook by the expert. To fulfill the requirements, we provide the instruments for the media experts and the linguist expert in the pocketbook. This is intended to check and validate the content of the book.
5. **First Product Revision:** After the previous stage is done, the product may face weaknesses and irrelevant materials. To develop and make a better product, The researchers then try to correct it based on the revised report.
6. **Early Trial:** Next after validation and revision, a trial should be made to measure the effectiveness and suitability of the pocketbook. The product will be tested to the lecturers and administration staff of the IT department.
7. **Second Product Revision:** This stage refers to the input feedback and suggestions by the subjects. The researchers may follow the instructions and suggestions of the readers to make the book well-fitted to the target.

RESULTS AND DISCUSSION

Needs Analysis and Data Collection

In this phase, the researcher collects the data and information regarding the needs of the subjects. We gather the data of the IT lecturers for international classes as well as the administration staff that must communicate directly with the foreign students. Afterwards, we tried to collect the information of frequently asked questions (FAQ) in communicating with the international students. To get the data, we interviewed four people including two lecturers, and two educational staff and questionnaires to the subjects.

At first, we distributed questionnaires on the subjects to discover their needs. It involved 10 items that were covered in four different criteria, specifically (1) communication, (2) language ability, (3) previous study, and (4) motivation. The calculation of the instrument was measured using Likert scale method. Next, the researchers interviewed the several subjects to check their English proficiency. The interview was conducted in English and 12 question items were presented on the interview. The questions dealt with the service, difficulties in communicating with the international students, strength and weaknesses in language, and additional media in using English language for teaching.

Subsequently, the researchers compile the interviews and the questionnaires from the subjects. We got numerous positive as well as negative responses based on the instruments. The followings are the detailed reasons why they need a pocketbook media:

The lack of supplementary media to learn English language in the office and classroom.

1. The English skills of the administration staff are poor, they could not speak the language well and tend to use body language to communicate with the international students. Additionally, they also face difficulties in replying to foreign students' text.
2. Some IT lecturers have the capability of speaking English quite well. Even though they produce few errors in grammar, but the context meaning of their speaking is still understandable. However, sometimes they do not have the standard formal English terms on how to open and close the meeting.
3. The minimum range of vocabulary acquisition for the administration staff.

Research Planning

In the research planning, it includes the activities to solve the issues from the instruments data. The researchers started to synchronize the results of interviews and questionnaires from IT staff and lecturers. Based on the data, we created a draft of the English pocketbook for the subjects. Further, the activities in this stage are: (1) content suitability for IT staff and lecturers, (2) pocketbook reference, (3) infographics media, (4) QR codes usage and placement, and (5) comic strips media.

We made a blueprint of the pocketbook to ensure the draft is highly developed. Afterwards, the draft was developed to check its content validity. As seen from the subjects' needs on the interview and questionnaires, three big pictures of the pocketbook were presented. The primary aspects were Expressions in Teaching, English for Office communication, and English for Meeting. The other features on the book were QR codes, infographics media, and chat template for the lecturers and staff. The following Mind Map present the main points of the pocketbook specifications.

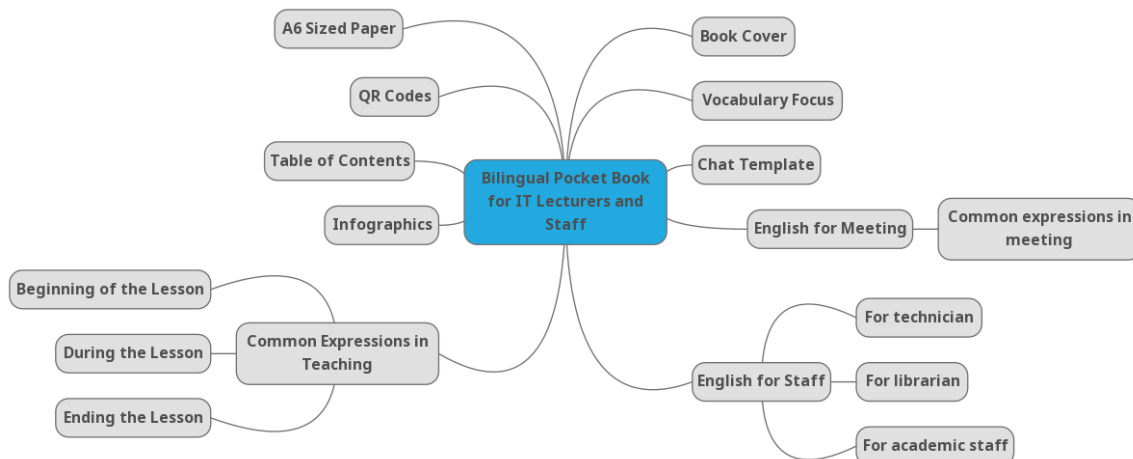


Figure 1. Mind Map of the Pocket Book.

Early Product Development

The product development was accomplished based on the instruments and the content draft of the pocketbook. In determining the prototype, the researchers had to discuss and collaborate with two senior lecturers of English for Specific Purposes to determine the materials that need to be involved in the book. The input from the expert was beneficial to explore more additional options and feedback on the materials. Besides that, we also concerned on the findings of the needs analysis for the draft.

The content draft of the pocketbook covers (1) common English expressions for teaching, (2) English for office staff, (3) English for meetings and several information on the IT department. The coverage of those three major points was also combined by comic strips, infographics, and QR codes could be done as the first sample of the product. As a result, 70 pages were written based on the subjects' needs. Each classification is provided by frequent terms in English and Indonesian language. The template of each term are presented in a two column table comparison to make the readers comprehend its meaning. The complete examples of each category are presented below.

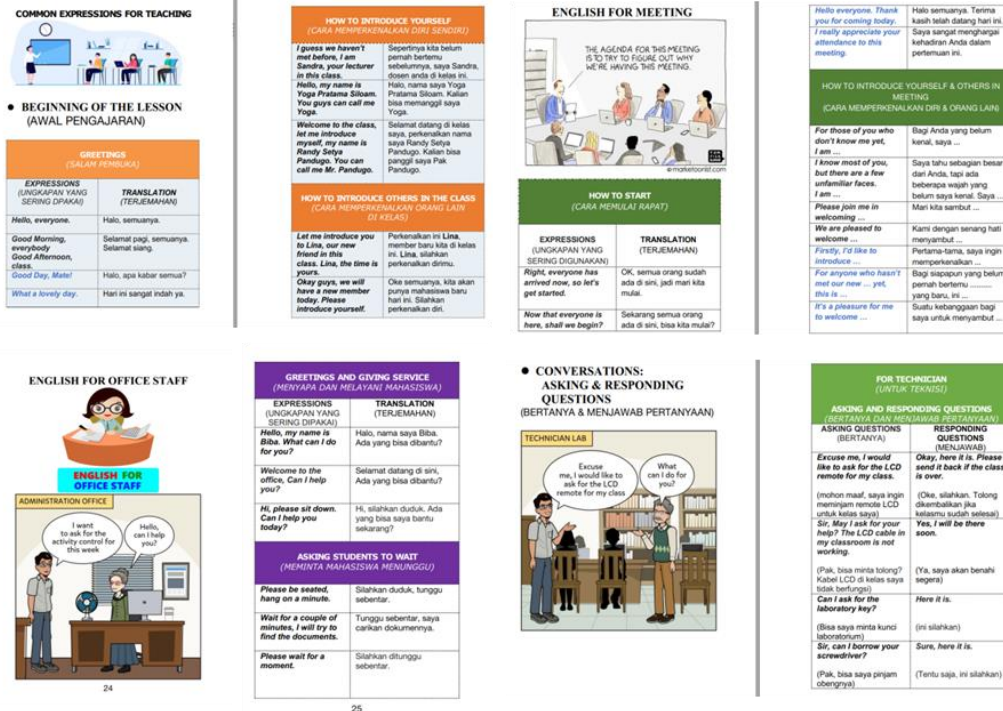


Figure 2. Categories of the Pocket Book

In the first part of common expressions for teaching, we provide three major points. They are beginning of the lesson, during the lesson, and ending of the lesson. Beginning of the lesson contains (a) greetings, (b) how to introduce yourself, (c) how to introduce others in the class, and (d) a video tips on starting a class. The content was based on how to greet, communicate, or even brainstorm with the international students in opening the class.

On the during the lesson part, the content includes (a) common instructions during teaching, (b) sequencing in teaching or presentation, (c) encouragement & error correction, (d) asking and responding questions, e) creating a group discussion, and (f) asking for clarification. Mostly, the items focus on delivering the message to the students and elaborating teaching materials. On the other hand, the end of the lesson part involves (a) time to stop, (b) time not to stop, (c) homework, and (d) goodbye and leaving the room. It deals with the circumstances or situation when the lecturers need to stop the lesson or leave the class.

Referring to the needs analysis, the materials on English for Staff concern on three different categories. Considering the subjects' lack of English acquisitions, the materials are based on a simple daily work communication. Content in this category cover (1) English for office staff, (2) English for technician, and (3) English for librarians. Each category provides different context and scheme for the jobs respectively. The materials include asking and responding questions for the students, giving service, asking for clarification and confirmation, and giving suggestions. We also provide them glossary and infographics related to parts around their surroundings.

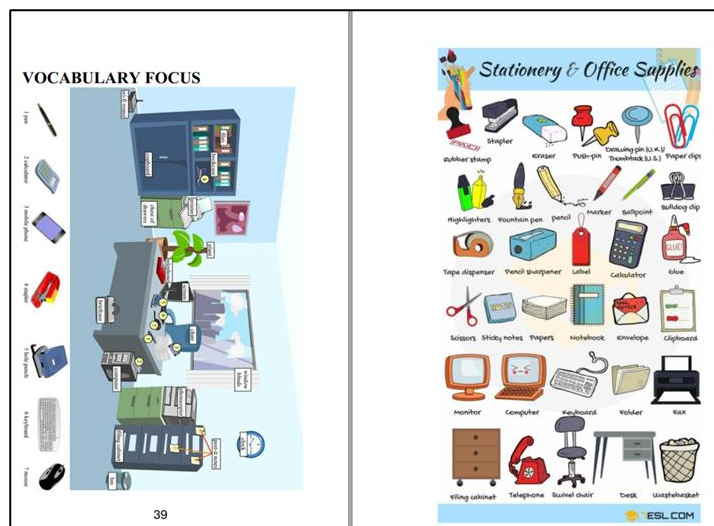


Figure 3. Infographics and vocabulary focus on

English for Staff

Lastly, English for Meeting contains practical expressions that are being used in the meeting. This section is provided to the subjects to aid them in having English conversation with the peers. Phrases such as how to introduce yourself and others in a meeting, having a presentation and steps of presentation, asking for a progress, giving suggestions in meeting, agreeing and refusing someone's opinion, and summarizing and giving conclusion in a meeting.

Expert Validation

In this section, expert validation was completed to determine how viable and practical the generated product is used (Richey, et al., 2004 & Bause, et al., 2014). The draft of the book was validated by the media and language experts. Validity test was carried out through numerous expert evaluation aspects, namely language and linguistics, designs and readability, and suitability of the book contents. This pocketbook was validated by two media experts and one ESP lecturer on linguistics aspect. The media experts reviewed the materials based on the use of the infographics and the QR code usage. In addition, they also suggested the placement and the suitability of the pictures. Meanwhile, the linguist expert checked on the language and content. The expert dealt with the use of formal language, common expressions, and vocabulary use in the pocketbook. The following table represents the results of the expert reviews.

Table 1. Results of the expert reviews

Items (scale of 1-5)	Linguistics aspects	Media Expert 1	Media expert 2
Design of the pocketbook			
1. The cover represents a pocketbook.		4	4
2. The layout in the pocketbook is suitable and easy to understand.		5	5
3. The fonts and tables in the pocketbook are appropriate and practical.		4	5
4. The color of the book pages is attractive, clear, and easy to read.		5	5
5. The comic strips and infographics in the book are interesting, clear, and comprehensible.		4	5
6. The QR codes are easy to be scanned and available to be checked.		4	4
Total		26 = 87%	28 = 93%
Materials of the pocketbook			
1. The materials are in accordance with the needs of lecturers, staff, and the use of English in meetings.	5		
2. Indonesian translation from English is easy to understand and in accordance with Indonesian grammar.	4		
3. Glossary (a collection of words) that are available according to the needs in daily use.	5		
4. The video in the QR codes in the pocketbook are authentic for teaching needs.	4		
5. Images in comic strips and infographics relate to the usage of English language in the educational area.	4		
Total	22 = 88%		

According to the linguist expert, the materials for the lecturers and staff should be authentic and applicable to the daily activity. Then, we developed the content not only based on the two-column table, but also include with the infographics and the QR codes. The infographics can be used as a summary for the previously presented materials on the table. Additionally, after the review, the color and fonts were then adjusted to make it comprehensible for the readers. The examples of the infographics can be seen on the figure 4.



Figure 4. Infographics Features

Further, the placement of the QR codes is also parallel with the infographics. The QR codes usage was to provide direct link to the YouTube video. Since it links to the website, the researchers got suggestions from the expert to present the video from the native speakers. This feature can help the readers not only to understand the context, but also knowing the class condition of by watching the videos. The Fig. 5 is the example on the usage of the QR codes in the pocketbook.

Product Revision, Early Testing and Evaluation

The product was then revised according to the opinions and suggestions from the experts. The pocketbook was early tested on the field by including all the subjects of the research. The research subjects were 21 lecturers and 4 administration staff of the IT Department. The chosen lecturers were those who teach international classes ranging from the first to sixth semester. Meanwhile, the selection of administration staff was based on those who mostly have a direct communication with the international students.

Due to the pandemic condition, the pocketbook was issued online in the form of e-book. Afterwards, we distributed questionnaires and open-ended response questions in order to get subjects' feedback and suggestions. The questionnaire items contain four criteria: design, subject matter, language, and media. A total of 12 items were presented for each aspect. The following is the result of a questionnaire.

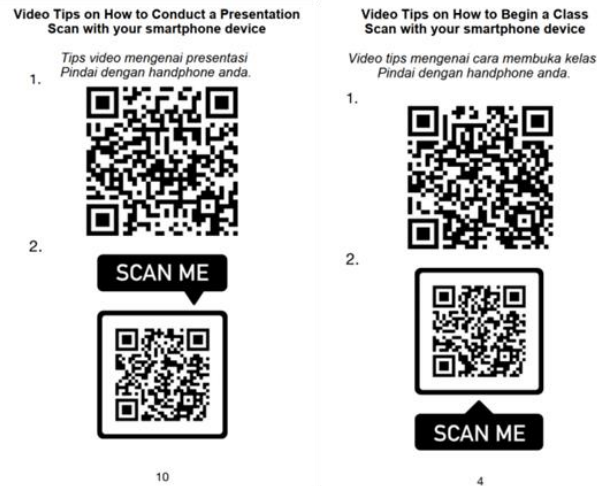


Figure 5. QR codes Features

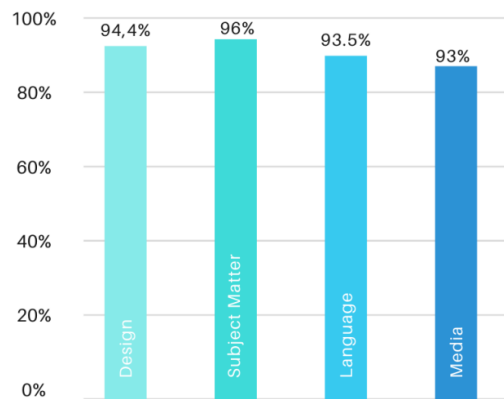


Figure 6. Tryout results from the subjects.

From the outcome above, all criteria of the pocketbook have reached above 90%. It reveals that the product can be accessed in a practical and feasible manners. The findings of expert and user reviews on the media usage in infographics and QR codes, indicate that the usage of a pocketbook can facilitate English communication learning. The suggestions and feedback of the pocketbook from the subjects are mostly positive. Some of them ask to give additional shortcut website links on the QR codes since they do not have the application to scan. Another subject also suggested to provide jokes or ice breaking in English during the lesson. One of the readers also recommended to provide the audio of the English pronunciation in the digital format, so the readers can apply it directly. Based on the feedback and suggestions, there is no major problems that need to be revised. In this case, the final product of the pocketbook can be published.

CONCLUSION

This paper presents pocketbook for IT lecturers and staff to communicate with the international students. The pocketbook was developed through Educational Research and Development (E-R&D) method by Borg and Gall. It involves seven phases, namely Needs Analysis & Data Collection, Planning, Early Product Development, Expert Validation, First Product Revision, Early Trial & Evaluation. The content of the book covers (1) common English expressions for teaching, (2) English for office staff, technician, librarian, and (3) English for meetings. In addition, infographics and QR codes media were added to provide authentic materials through video and vocabularies in learning English expressions. The experts reveals that 90% of the media and 88% of the materials are suitable with the subjects. According to the feasibility assessment on the tryout, the readers score 94.4% in design, 96% in subject matter, 93.5% in language, and 93% in media usage. Based on the results of the experts and responses from the subjects, it appears that this book is well-designed and beneficial for the Information Technology lecturers and staff.

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