

Designing a Website for technical English-majored Undergraduates to enhance their English for Electrical Engineering and Electronics

Nguyễn Thị Minh Trâm*, Trương Minh Châu**

*Tiến sĩ, **Thạc sĩ, Trường Đại học Ngoại ngữ, Đại học Quốc gia Hà Nội

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Abstract: The purpose of this research was to develop an interactive website to enhance technical English-majored undergraduates' English for Electrical Engineering and Electronics (EEEE) competencies. Qualitative data was collected from in-depth interviews with 17 EEEE undergraduates, 5 graduates, and 2 lecturers from a technical college in Hanoi. The research findings have indicated the website expected learning outcomes, assessment and contents. The recommended website specifications can be references for the lecturers, course developers and institute leaders in their own practice.

Keywords: Website, English for Electrical Engineering and Electronics.

1. Introduction

English has become the main source of technical progress as it enables rapid exchange of information and research of the common global problems. In the early 1970s, numerous attempts were made to describe English for Science and Technology (EST) in the branch of English for Academic Purposes. EST has experienced exponential developments for some recent decades. Being a part of EST, English for Electrical Engineering and Electronic (EEEE) also follows the trend. Furthermore, since the wide spread of COVID-19 throughout the world, each institute develops its own E-learning systems for distance learning so the inter-relationship between E-learning and EEEE course is critical in learners' process.

The study, therefore, is aimed at designing an interactive website to enhance learners' EEEE competency based on a needs analysis. The overarching research questions of the current study should be "What are the website specifications to enhance undergraduates in learning English for Electrical Engineering and Electronics?" The results of the study can hopefully provide theoretical and practical recommendations for ESP lecturers, EEE undergraduates and institute leaders in their practice in the designing or learning process related towards EEEE website.

2. Research content

2.1. English for Electrical Engineering and Electronics

In EST, the role of EEEE is as important as other fields. However, the definition of EEEE has not been discussed and indicated thoroughly in literature. The

two features of current EEEE courses (Glendinning, 1980; Sinclair & Dunton, 2007): 1) content-based courses with electrical-relating topics (e.g., Electrostatic forces, electric current, and electromotive force). 2) two main knowledge areas namely technical terminology and reading comprehension.

However, according to Huhta, Vogt, Johnson and Tulka (2013), the matter of ESP "should be redirected away from foreign language education and towards training in communication for professional purposes". As a result, the content development for ESP in general and EEEE in particular should be shifted from only terminology and reading to more focus on communication purposes, which is also the working definition of EEEE in the current study.

2.2. Working framework for website design

Different frameworks of design have been developed throughout the history of ELT. They consist of common elements such as learners' needs, their goal, and their learning plan, evaluation and assessment. These elements are included in the three stages of Backward Design (Wiggins and McTighe, 2006): 1) Identify the desired results 2) Determine acceptable evidence 3) instructional plan. This framework starts from identifying learning outcomes and then constructing the assessment plan and finally the specifics of instructional planning will be made for appropriate learning activities. The framework can be the working framework of the current study because it has been seen as a practical, simple approach (Enger & Yager, 2001). However, some adjustments to the third stage were made to suit the website design in the study.

3. Research Methodology

3.1. Participants: Three groups of participants from a technical university participated in semi-structure interviews. Specifically, 17 second year technical English-majored undergraduates, five graduates who experienced EEEE courses and two EEEE lecturers with over 15 years of experience in teaching, and developing the EEEE program were chosen based on convenience sampling.

3.2. Data collection instrument and procedure: The interview developing process was conducted under consultations from an expert with 15 years of in teaching and conducting research in ESP. The sets of interview questions were designed following the structure of Backward Design (Wiggins and McTighe, 2006).

Before the interviews, the participants were provided with a set of semi-structured questions to brainstorm and informed that the interviews were recorded to serve the data analysis process. The interviews with time limit from 20 minutes to 45 minutes were conducted in Vietnamese to ensure the smooth sharing from the participants and conducted online through Zoom Meeting to ensure the time flexibility and convenience for the participants.

3.3: Data analysis procedure: The data collected from the interview was analyzed using thematic analysis with the flexible process of coding (and theme development) (Braun & Clark, 2019). Themes are produced by organising codes around a relative core commonality, or ‘central organising concept’, that the researcher interprets from the data (Braun and Clarke, 2019). The data were then compared, contrasted to indicate the similarity and differences. Last, after being synthesized, the findings were reported towards main points with quotations.

4. Findings and discussion

4.1. Website expected learning outcomes

The expected learning outcomes were explored from the perspectives of the undergraduates, graduates and the lecturers. Although all the 24 participants agreed and supported the idea of having a supplementary website, their needs towards the website varied. Specifically, 15 out of 17 undergraduates and a lecturer reported that the undergraduates should accumulate adequate technical terms and knowledge to pass the exam and meet the course requirements:

“The undergraduates need to acquire technical knowledge and develop their learning methods for ESP. Thus, the website should provide knowledge relating to their studies at the university first. Then, it may go further. (Lect_2)”

One undergraduate raised a different opinion:

“I desire a website relating to real life more than only based on the lecture. I’m not really interested in the course; the real experience stimulates myself learning. So I think I need both the necessary terms to pass the course and some further knowledge for my future careers”. (Under_EEEE_6)

According to five graduates and both lecturers, the undergraduates should be equipped with information searching and communicative skills, especially in EEEE situations. Similarly, from their experience in the workplace, two graduates also mentioned that students should develop more employable skills to keep up with changing technology:

“I think that technical knowledge should not be provided too much because the university provided only the basic ones. When you work, technology changes by days, you cannot base on the accumulated knowledge. But skills can help, it should provide necessary communicative skills in EEE environment such as: researching information, presentation, writing email, etc”. (Grad_1)

“I think the undergraduates should pay more attention on improving their communicative skills such as writing email, presenting and dealing with others rather than only learn technical knowledge.

Based on the findings, the learning outcome expectations varied according to different groups of stakeholders. According to Brindley (1989), learners’ English needs depend on various expectations, interpretations and individual value judgments. It is, therefore, important to ensure that interpretations consider the perspectives of all those involved.

4.2. Website assessment

The participants also provided suggestions for assessment methods of website. Among 17 undergraduates, 15 of them desired to have different insightful assessment activities for their exercises and performance after doing the given task instead of only mark results:

“I would like the website to provide the comments part after each post. For example, when I upload my video clip or my writing piece, I hope that I may receive users’ feedback and comments. (Under_EEEE_10)

The two lecturers also emphasized the importance of real-life topics in assessing learners. One reported: “They are more interested in some topic relating to their real life such as electric circuits, components which they can see, touch rather than the abstract one.” (Lect_1)

The findings show that both formative assessments with on-going, interactive evaluation nature and

summative assessment with standardized tests (Sadler, 1989) were recommended by the stakeholders for a holistic evaluation. The findings amplify Klimova's (2015) study in conducting different types of assessment to boost their motivation in learning EEEE.

4.3. Website contents and tasks

Rooted from the major expected learning outcomes, the website contents and tasks were expected to include exercises of technical knowledge and terms. Besides, a majority of undergraduates agreed that the collaboration and diversity of exercises were more attractive than only focusing on one type such as true/false statement, multiple choice and gap fillings. Hence, the website contents should be equipped with diverse activities.

Besides vocabulary, English productive skills such as writing emails (four graduates and five undergraduates) and presentation (two graduates and two lecturers) were suggested to be put under consideration. Particularly, 12 out of 17 learners desired to learn with interactive activities, videos, real models and situations:

"I would like to have more in-class activities and interaction. If I could learn the course again, I would ask and share with my friends more often" (Under_ EEEE_9)

Consequently, the website may provide some samples for writing email based on real situation or some other official documents such as reports, action minutes, etc. The users can take some samples as references, imitate and share their exercises with others for constructive feedback among learners."

4.4. Features of a website

Besides the website outcomes, assessment, contents, and tasks, the distinctive features of a website were also suggested for a proper website version. Although the stakeholders suggested different appearances and designs for the website. They all agreed that the designs should be attractive, readable, and simple for the users. Specific features are reported below.

Register and Login features: Six out of 17 undergraduates suggested that the website should have interaction between users – users, administrators – users.

Creating users' own technical terms library based on their account: One undergraduate provided a helpful suggestion to improve their learning methodology for technical terms, which is to create term saving function, which can also solve the problem for memorizing technical terms for undergraduates.

Connecting with other social networks to wide-open the website ecology to attract human resource, job hunts: All undergraduates show that it is obvious that not only the interaction among learners – lecturers and graduates, but the website is also expected to provide the connection with the human resources all over the country, which helps learners stay up-to-date with the companies' requirements and needs.

5. Conclusion

Different groups of stakeholders were invited to give recommendations for the design of EEEE website for the undergraduates. First, the major expected learning outcomes are comprised of the mastery of technical knowledge and terms, information searching and employable skills. Second, both formative and summative assessment activities were recommended to be required on the website. Third, the website instructions were expected to include exercises of technical knowledge and terms, those that require collaboration and interactive activities, English productive skills, videos, real models and situations. Finally, some detailed website features were also recommended for appropriate website design.

A supportive platform to enable the learners to interact and communicate with each other is highly recommended to enhance their EEEE learning. Furthermore, the illustration of the technical elements on the website should be systematic, well-organized and supportive for networks to encourage the learners in using the website.

The present research has some limitations which imply suggestions for further studies. First, the triangulation of data from different research tools is not available in this study since interview was conducted as the only research instrument. Thus, questionnaires can be used to investigate the research topic on a wider scale. Second, the website design needs further validation and adjustments before application, so a pilot implementation of the website is necessary for a proper website before its official implementation to EEEE students.

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